



Conceptualizing of Sustainability in The Civil Aviation Sector in Dubai
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By
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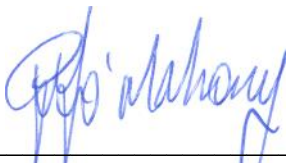
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Abstract

The civil aviation sector in Dubai has become a world leader because of its constant advancements and implementation of new technologies. It has been fostering the economic development of Dubai by enhancing transportation, establishing trade links, promoting tourism, and providing job opportunities. Even though it is a thriving sector, it should pay heed to its sustainability strategy. This dissertation aims to investigate sustainability indicators within the civil aviation sector in Dubai as per the sector's key stakeholders and to identify the perceived ranking of sustainability indicators within each stakeholder group. The research is based on a qualitative research design and AHP framework. The type of qualitative design considered for the current study was phenomenology, and focus groups were conducted with 148 people as a part of the qualitative research design. After determining the indicators and sub-indicators, the AHP framework was shown to rank the indicators based on the priorities of the stakeholders, who were experts and knew about the aviation sector's sustainability. The study's findings focus on the three pillars of sustainability: social, economic, and environmental sustainability indicators. Economic sustainability had the highest priority ranking of the three leading sustainability indicators. Based on the analysis, it is found that the three top priorities of social sustainability are regional competition, passenger safety, and quality of life of stakeholders like employees and passengers. Three leading indicators for economic sustainability are extensive data management, economic growth, and economic development. Lastly, environmental awareness, air quality, and waste reduction are the three top priority indicators of environmental sustainability.

Keywords: Civil Aviation, Sustainability, Stakeholders' Engagement, Sustainable Aviation, Indicators, United Arab Emirates, Dubai

List of Abbreviations

ACI – Airports Council International

AED – Dirhams (UAE's Currency)

AHP – Analytic Hierarchy Process

AI – Artificial Intelligence

CSR – Corporate Social Responsibility

GCAA – General Civil Aviation Authority

GDP – Gross Domestic Product

IATA – International Air Transport Association

ICAO – International Civil Aviation Organization

UAE – United Arab Emirates

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1 Introduction

1.1 Background Information

Civil aviation has become one of the essential pillars of national economic development in the modern world, contributing to creating new products and services, establishing new workplaces, and creating specific value for engaged stakeholders (Marais & Weigel, 2006). The development of the civil aviation sector is related to the generation of a particular influence on varied categories of business stakeholders, which mainly include the following: “manufacturers, passengers, freight, airport & services, aviation services, governments, and air transport sector” (ILO, 2013, p.2). Together with the significant economic benefits of operations in the civil aviation sector, this important instrument of social benefits generation guarantees effective communications and cooperation between actors in different regions of the world, thus contributing to the growth of the world economy and trade systems. The potential effect of the civil aviation sector on various stakeholders can be divided into four main categories: direct and indirect effects and induced and catalytic effects (Airports Council International (ACI), 2019). There is a significant effect of processes in the civil aviation sector on stakeholders’ personal and professional lives. For instance, one of these aspects is promoting sustainability in the civil aviation sector (Amaeshi & Crane, 2006; Payán- Sánchez, Plaza- Úbeda, Pérez- Valls, & Carmona- Moreno, 2018; Lutte & Bartle, 2017). These authors have further mentioned that Sustainability is a complicated challenge involving several organizations, individuals, and countries. Sustainable measures must be created in

partnership with the sector's most important stakeholders for each commercial and civil aviation job. Furthermore, this industry is marked by a significant level of downturns.

There are rising sustainability concerns due to the aviation industry in many countries. For example, research conducted by Chen, Hu, Razi, and Rexhepi (2021) showed that the G-7 countries, such as Canada, France, Germany, Italy, Japan, the UK and the USA, are the primary contributors to carbon emissions and their aviation sectors have the highest contribution to the carbon emissions because of local and international air transport. As per the information provided by Graver, Zhang, and Rutherford (2019), it was observed that UAE's aviation sector had 21.1 MMT of carbon emissions from passenger transport, whereby the US and China had the highest of 182 MMT and 94.9 MMT, respectively. It shows that UAE had significantly fewer carbon emissions than other countries but was still ranked 6th regarding carbon emissions (Graver, Zhang, & Rutherford, 2019). It is necessary to focus on the sustainability of UAE's aviation sector, particularly Dubai because it is the primary location of domestic and international travel out of the 7 Emirates.

The specifics of the development of the civil aviation sector in Dubai demonstrate that this economic sector plays a critical role in Emirates' economic growth. According to pre-Covid-19 assessments, the overall economic activity of the civil aviation sector in the UAE was expected to reach AED 200 billion, which would correspond to about 20 per cent of the country's GDP in 2019 compared with 2018 per cent in 2018 (John, 2018). Civil aviation activity was also expected to generate 750,000 jobs and substantially improve the

UAE's standards of living and social development (John, 2018). The direct performance benefits of the civil aviation sector in Dubai are also connected with the role of this sector as a way of Emirates' economic diversification (Schiliro, 2013). The analysis of governmental policies in the development of the civil aviation sector also demonstrated the sector's significant role in the Emirate as a whole. Recently, the Dubai Government (2020) has presented a project to develop artificial intelligence (AI) technology that should optimize the quality of the civil aviation sector services in the future. Innovations are continuously introduced in the civil aviation sector, which focuses on improving the quality and security of its services (Dubai Airshow, 2019). One of the critical aspects that Dubai's civil aviation sector focuses on is the sustainability of its operations. Economic sustainability is also a core aspect that needs to be focused upon in terms of economic growth. Overall, the civil aviation sector plays a severe role in the economic development of Dubai.

Sustainability can be considered the ability of the organization or business to preserve its entity and balanced performance model despite the negative influence of the environment and internal factors of the development (Mensah & Casadevall, 2019). Gupta, Mishra, and Tandon (2020) mention that sustainability is an essential aspect of the aviation sector because many countries, individuals, and corporations are concerned about the safety of passengers and employees, air pollution, high fuel consumption, and increased emissions by the aviation sector. The increasing concern of sustainability regarding the environment and social impact in the aviation sector has become more relevant, requiring detailed discussion and analysis.

1.2 Problem Statement

Sustainability is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (White, 2013). Various global standards focus on implementing sustainability and reporting them using various aspects. For instance, in current times, United Nations (UN) Sustainable Development Goals are one of the central sustainability-related objectives that organizations can implement for better sustainability practices (United Nations, 2018). Also, Herath and Rathnayake (2019) have outlined that one of the primary sustainability models used globally for integrating sustainability practices is the three pillars model that explains the implementation of economic sustainability, environmental sustainability, and social sustainability. There are some standards for global reporting practices, known as Global Reporting Initiative (GRI), an international standard that allows companies to report their sustainability practices (GRI, 2016).

In addition, the aviation sector is a global business that follows global sustainability standards known as the International Civil Aviation Organization (ICAO). The organization also focuses on increasing sustainability among aviation companies, but the primary focus of the global body is on environmental sustainability (ICAO, 2021). The current research focuses on three sustainability practices, economic, social, and environmental, which would guide Dubai's civil aviation sector.

Also, Dubai's aviation sectors must report their sustainability practices by following the reporting standards, and the UN sustainable development goals guide its 2030

sustainability agenda. Dubai's civil aviation sector is one of the UAE's most advanced and quickly developing sectors, locally and internationally. However, Alameeri et al. (2017) mentioned that sustainability is one of the significant concerns in Dubai's aviation sector. The author outlined that Dubai's aviation sector has a large carbon footprint for which the country and the government, along with the aviation sector, are taking necessary precautionary measures to ensure sustainability in the civil aviation sector. Also, the timely developments and changes in Dubai's civil aviation sector have impacted various stakeholders differently. For instance, with the increasing focus on sustainability globally, passengers are more concerned with their security and safety while travelling, air emissions, and social awareness, among others.

Similarly, managers are more concerned with the economic aspects and environmental aspects. All the stakeholders have different challenges and perspectives in terms of sustainability, and also, they are aware of the apparent benefits of civil aviation services. However, still, the sector faces some concerns in terms of economic, social, and environmental sustainability. Also, these aspects would have different factors in terms of a different set of stakeholders. No other research has identified the indicators of economic, social, and environmental sustainability in Dubai's aviation sector in terms of stakeholders, such as passengers, the Civil Aviation Authority, Airlines, and Airports. These stakeholders are essential in maintaining sustainability in Dubai's aviation sector. The requirement for players in the civil aviation sector to comply with these principles of long-term development places additional requirements on the process of strategic planning and management.

At the same time, realizing a sustainable development model in any business is associated with effectively including different stakeholders in the decision-making process. Since one of the main results of the organization's performance is related to a significant influence on different categories of stakeholders, it is crucial to identify the interests and positions of stakeholders in the process of creating a sustainable development model (Ayuso, Rodríguez, & Ricart, 2006). Also, it would help benefit the stakeholders and ensure sustainability in the civil aviation sector. Analyzing stakeholders' positions in the context of the existing model of sustainable development realization is vital since changes in stakeholders' attitudes can severely affect organizational performance outcomes (Benn et al., 2016). In this context, it is essential to analyze the indicators of the sustainable development of the civil aviation sector in Dubai from the perspective of stakeholders, such as civil aviation authorities, airports, passengers, and airlines.

In contrast to carbon emissions of the global aviation industry, a sustainability study issued by Graver, Rutherford and Zheng (2020) found that international trips were accountable for around 85 per cent of general aviation carbon emissions. In 2019, this contributed to 785 million metric tons of carbon emissions. Between 2013 and 2019, commercial airlines' transport-related carbon emissions climbed 33 per cent. For the same time, the frequency of aircraft operations climbed 22 per cent and revenue passenger kilometres, also known as RPKs, showed an increase of 50 per cent. This indicates that commercial aviation traffic rose roughly four times quicker than fuel economy improved. It may be noticed that carbon emissions are a big problem globally regarding civil aviation. The Asia-Pacific area revealed a high carbon emission region-wide compared to other

nations. Graver, Rutherford and Zheng (2020) also noticed that emissions rose slower than the world average in many locations. For instance, it was 27 per cent in the Middle East, 21 per cent in Africa, and 19 per cent in Latin America/Caribbean. It may be seen that the Middle East pays substantially better attention to sustainability than other areas.

However, in the examination of country-wide comparison, the authors discovered that the US had released 23 per cent of worldwide passenger transport-related carbon emissions, which was the greatest compared to other nations. UAE has released 2.7 per cent of global passenger transport-related carbon pollution, which was pretty low compared to the US and other significant countries. Even though UAE had low carbon emissions compared to the US and other major nations, it was still ranked 6th out of 10 in the largest carbon emissions. Its carbon emissions were more significant than those of India, France, Spain, and Australia. Concerning foreign operations, carbon emissions were significant owing to overseas flights (Graver, Rutherford & Zheng, 2020). (Graver, Rutherford & Zheng, 2020). For instance, nearly 61 per cent of passenger service carbon emissions in 2019 originate from an international flights. For example, international flights leaving the United States produced the most carbon emissions, while the UAE ranked fourth in global flight carbon emissions. International passenger activities are the primary source of carbon emissions at international airports.

For a region-wide comparison, specifically in the Middle East and North Africa (MENA) Region, it was found that Dubai (DXB) Airport is the busiest airport as it had the highest passenger traffic of 86.3 million passengers in 2019. Also, concerning carbon

emissions, the UAE has the highest in the MENA region, followed by Saudi Arabia, but that is because of increased passenger traffic (Mordor Intelligence, 2020). However, the report further outlines that Etihad Airways emerged as the first airline to fly a passenger flight using biofuel from plants grown in a desert. Furthermore, UAE's aviation sector in the MENA region is a leading sector in maintaining sustainable practices, and this shows that the country is significantly improving its sustainable practices.

Concerning the comparison of the airports, such as London Heathrow (LHR) Airport and Paris Charles de Gaulle (CDG) Airport, Dubai (DXB) Airport has the most extraordinary carbon emission from international passenger transportation (Graver, Rutherford & Zheng, 2020). It may be seen that Dubai's aviation industry must prioritize sustainability. Even though sustainability is a concern for Dubai's aviation, the concept of sustainability is not well researched and studied academically in Dubai's civil aviation sector, as its importance has increased over the years due to raising awareness of sustainability. However, commercially, Dubai's aviation industry has placed more emphasis on sustainability and sustainable practices.

In addition, theories, such as the triple bottom line framework (TBL), explain the concept of sustainability and the three bottom lines social, economic, and environmental. However, there is no appropriate way that one can use to measure these aspects. Sridhar and Jones (2013) have criticized the TBL framework by pointing out that businesses pick the metrics that are the simplest for them to track and share data about while ignoring the metrics that can either be quantified or that may show a less favourable aspect of the

organization in relation to its efforts to be sustainable. Second, and much more linked explicitly to the TBL reporting requirements, there is a shortage of integration between the TBL sustainability concepts since each concept is autonomous from another in respect of its assessment. This lack of connectivity can be seen in the TBL concepts. The effort that should be placed on businesses to demonstrate ties or interdependencies between such key pillars and how one might affect the other is not being exerted. Keeping the above criticism in mind, the current research focuses on all three concepts. It shows that all three aspects must be studied and analyzed simultaneously rather than focusing on them individually, and the focus on sustainability is done through sustainability theory. Also, Sridhar and Jones (2013) mention that the TBL framework does not provide any basis for prioritizing the requirements and demands of various stakeholder groups.

To understand the perspectives of different stakeholder groups, the current research has underpinned the work using stakeholder theory and stakeholder salience theory. One of the problems with the stakeholder theory is that it does not make it possible for researchers to distinguish between groups of people and individuals who are relevant to a particular research project and those who are not. Another problem is that stakeholder identity can be challenging to determine (Phillips & Reichart, 2000). People can provide a broad range of advantages to the organizations with which they have been linked because of their unique perspectives and experiences. However, in the context of a particular business, for instance, the aviation sector, the whole world may be divided between persons who are members of the organization in some capacity and those who are not genuine. However, taking into consideration one of the facets described by Chang et al. (2017), the

problem of stakeholder identification was brought into the spotlight. The authors point out that critical stakeholders, as opposed to secondary ones, often directly influence the organization or are impacted by it somehow. Also, to overcome the issue of sustainability, the current research has focused on stakeholder salience theory. Focusing on stakeholder salience would allow the organizations to understand worldwide stakeholders' relevance and assist companies in comprehending local interests while enabling them to concentrate on essential principles, interests, and objectives (Gianfelici, Casadei, & Cembali, 2018). Managers are obligated to acknowledge and assess the significance of the value of their company's relationships with stakeholders.

The concept of sustainability is complex and multidimensional nature (multiple indicators of sustainability) explains the importance of sustainability conceptualization in the Dubai civil aviation sector. The following dimensions and forms of sustainability are currently identified: economic, environmental, ethical, and social (John & Narayanamurthy, 2015). From this perspective, different forms of sustainability in the development of the civil aviation sector are associated with differences in the specifics of the influence on engaged stakeholders and in the form of stakeholders' engagement to improve a specific form of sustainability. As a result, it is essential to conceptualize different forms of sustainability in the Dubai civil aviation sector and identify particular forms of development for each sustainability dimension.

1.3 Research Context and Justification

The context of the current study is Dubai's civil aviation sector, as sustainability is one of the main aspects of the sector. The civil aviation authority is one of the most significant authorities in the UAE, which contributes significantly to the country's social and economic growth. For instance, the UAE's civil aviation sector's strategic objectives are to increase the safety of air services and implement the best standards for the country's people (GCAA, 2019). Also, the UAE's civil aviation sector has various achievements, such as organizing international workshops and being a part of conferences focusing on increasing aviation safety. One of the primary focuses of the UAE's civil aviation sector and its authorities is protecting the environment and contributing to the UAE's sustainable growth (GCAA, 2019). The nation is strongly committed to greenhouse gas moderation and is very involved in all matters related to environmental change. Dubai's aviation sector has taken several measures to ensure sustainability, including environmental planning, sustainable design, waste recycling, new technologies, environmentally safe construction, and other initiatives (DAEP, 2021). Various airline companies, individuals, and the UAE government have also invested much in enhanced technology and infrastructure for the development of the aviation sector (Khan and Khan, 2016; Schiliro, 2013). Such investments and products ensure economic growth and sustainability in Dubai's aviation sector (Khan and Khan, 2016).

Additionally, the UAE Government has dramatically progressed in streamlining Dubai's civil aviation industry operations. For instance, it has improved airspace utilization specifically to facilitate local and international aviation traffic transit. Along with it, there have been some critical advancements in the aviation industry, such as adding

more direct air routes connecting Abu Dhabi and the Kingdom of Saudi Arabia and significantly decreasing travel times, energy consumption, and carbon dioxide emissions. Ground handling and catering activities are being scrutinized to mitigate environmental effects via composting, recycling, waste treatment, and collaborative partnerships with the communities (UAE Aviation, 2019). Airline companies throughout the nation have implemented energy conservation and waste minimization initiatives. The UAE established an extensive aviation and climate change strategy in 2012 (UAE Aviation, 2019). This guideline emphasizes the International Civil Aviation Organization's (ICAO) responsibility to mitigate the effect of global aviation carbon emissions. It can be observed that UAE's civil aviation sector is expanding incredibly, and it has always kept its focus on sustainable development and growth.

Additionally, the focus is to understand the role of sustainability in the operations of the civil aviation sector in Dubai and assess optimal ways of stakeholder engagement to achieve the goals of sustainable development of the chosen sector in Dubai. It was stated earlier that the expansion of the civil aviation sector in Dubai is associated with significant benefits, such as social and economic benefits for the engaged stakeholders in various domains like finance, legal, and other such domains. In addition, the 2030 sustainable agenda of the UAE focuses on improving sustainability in multiple sectors, including the aviation sector (SDG Report, 2016). Also, the aviation industry is putting in massive efforts to reduce carbon emissions, but there should be an emphasis on stakeholders' perspectives, which is done in the current research. However, there is a very brief discussion in the SDG Report (2016) on how to maintain sustainability in the aviation sector, as no specific

framework has been presented in the context of Dubai's aviation industry. In addition, Graver, Zhang, and Rutherford (2019) have reported sustainability concerns for environmental sustainability in Dubai's aviation sector. Also, the research done in other contexts cannot be applied to Dubai's civil aviation industry because every country has sustainable operations, legal laws, actions, and other related aspects. The aviation sector's emissions, security, and other elements are different in all countries because of different cultures, regulations, individual perceptions of sustainability, and other reasons. The aviation sector is considered one of the primary sectors that increases sustainability-related concerns for the countries and their individuals, which also applies to the UAE.

The leading organization in the UAE takes care of Dubai's aviation sector in Dubai Aviation Engineering Projects (DAEP). DAEP has increased the focus on sustainability as the country, and its individuals are concerned about various aspects of the country, such as the economy, environmental impact, and other societal concerns. The increased focus on Dubai's aviation sector and its need to improve sustainability in the UAE has motivated the researcher to choose this innovative research context. Hence, it is essential to provide a reliable conceptualization of sustainable development and determine the role of stakeholders in sustainable development and specific ways of stakeholders' engagement. The increased engagement of stakeholders will help the civil aviation sector achieve sustainable growth and development.

1.4 Research Questions and Objectives

The identification of the research problem and the context of the study has led to the definition of the following key research objectives and questions:

RO1. To define the critical categories of stakeholders engaged in the sustainability of the civil aviation sector in Dubai.

RQ1. What are the key categories of stakeholders related to the sustainability of the civil aviation sector in Dubai?

RO2: To understand the impact of crucial sustainability indicators (social, economic, and environmental sustainability) on stakeholders' engagement and the overall sustainability in the aviation sector of Dubai.

RQ2. How do the critical sustainability indicators (social, economic, and environmental) impact stakeholders' engagement and the overall sustainability in the aviation sector of Dubai?

RO3: To outline the role of stakeholders' sustainability indicators in helping stakeholders find each other to enhance sustainable development and growth.

RQ3. How can the identified and ranked sustainability indicators help stakeholders find each other to enhance sustainable development and growth?

1.5 Significance of the Study

The significance of the study is manifested as follows: First, it analyzes the significant role played by the civil aviation sector and its stakeholders in the socio-

economic development of Dubai. In the past, different stakeholders were concerned with the effective development of the civil aviation sector in Dubai, indicating its importance for the Emirate. The government of Dubai (2018) has presented a set of initiatives focused on improving conditions in the civil aviation sector, including the rejection of the reduction of landing fees for private jets, a decrease in tax pressure, and the attraction of foreign investors to Dubai. From this perspective, the successful development of the civil aviation sector is of high importance for the economy and society of the Emirate, which requires the analysis of optimal ways of stakeholder engagement for future development.

Second, the study analyzes the critical role of sustainability in developing competitive and efficient business activity. The effective integration of different forms of sustainability in the company's business strategy is a crucial factor for success in the future (Giovannoni & Fabietti, 2013). Analyzing the dimensions of sustainable development of competitive and efficient business activity contributes to identifying the critical role of stakeholders in this context (Matuleviciene & Stravinskiene, 2015). Also, an analysis of the three sustainability dimensions, such as social sustainability, economic sustainability, and environmental sustainability, would impact various stakeholders of the aviation sector, such as passengers, airlines, airports, and civil aviation authorities. Focusing on social sustainability would help the stakeholders achieve passengers' safety and security, increase social awareness, equal opportunity, and other social benefits. However, these social sustainability indicators would differ based on the stakeholders. Such analysis would be carried out with the help of the AHP framework. The study is significant in analyzing stakeholders' views and opinions regarding sustainability. The similarities and differences

among their views and points outlined would help the aviation sector to make the similarities and differences as points to focus on improving the sustainability and related operations in Dubai. For instance, security is one of the stakeholders' concerns, which means that the sector should focus on improving safety to maintain satisfaction for all the stakeholders. However, economy-related aspects would not be a concern to everyone, so the industry should focus on improving that aspect based on the circumstances of a specific stakeholder.

Stakeholders are essential for the future development of the Dubai civil aviation sector, so their role and contribution must be adequately assessed. Identifying ways for the effective integration of stakeholders and their engagement in creating sustainable development practices for business is essential (Silva et al., 2019). The position of stakeholders must be included to effectively mitigate risks existing in the strategic development process of achieving competitive and efficient business activity (Kaplan & Mikes, 2012). Overall, the detailed conceptualization of sustainable development of the Dubai civil aviation sector is highly important for the future development of the industry and the Emirate in general.

1.6 Academic Contributions

Before discussing the critical contributions of the current study, it is essential to compare Dubai and other countries and why the study is only limited to Dubai. The recent research focused on similar research but in a different context. To begin with, Londoño-Pineda, Cano, and Gómez-Montoya (2021) conducted research focused on sustainability

and identified indicators based on the 17 UN sustainable development goals. The study was conducted in Colombia. Also, Kumar and Garg (2017) researched India's automotive sector, whereby the authors focused on sustainability in supply chains using AHP. Concerning the aviation industry, research on sustainability is underpinned by AHP methodology in different contexts like India and Turkey, among other general contexts. Tuzkaya (2009) conducted the study in Turkey, and it only focused on environmental sustainability as a focus in the aviation sector.

However, Singh, Sharma, and Srivastava (2019) have focused on determining sustainability based on three sustainability indicators, but the primary focus was on aviation fuel. There are various other researchers like Mahtani and Garg (2018), Ogbojafor and Adekoya (2014), and Eshtaiwi et al. (2018), among other researchers, have focused on India, Nigeria, and Libya, respectively. However, some of the papers only focus on specific sustainability indicators and not all three sustainability indicators. In addition, Dubai is highly rich in culture as it has a high number of expatriates working in the aviation sector, has a robust economic environment and culturally diverse organizations. Due to such a mixed environment of the organizations, stakeholders have differing views on sustainability. For instance, expatriates might have one idea regarding a social sustainability indicator, while UAE locals might have a different perspective based on their culture and other demographics. Hence, the current research will allow focusing on all common aspects that are not highly differentiated according to demographics and apply to the sector as a whole, along with all kinds of stakeholders. Also, Dubai's aviation sector is

trying to focus on the sustainability of the industry in general from the perspectives of stakeholders on three main pillars of sustainability.

The critical contributions of the study include the following: First, the study uses the adequate conceptualization of sustainable development to analyze the efficiency of the civil aviation sector in Dubai. It considers different dimensions of sustainability and explores their role in the operations and future development of the civil aviation sector. It draws out similarities and differences in how the different dimensions of sustainability are related to critical stakeholders in the industry. Also, identifying these sustainability indicators would help Dubai's civil aviation sector work and improve, allowing it to make a global presence in terms of high sustainable growth and development.

Second, the study considers the role of the stakeholders in achieving sustainable development of the civil aviation sector. It identifies critical categories of stakeholders engaged in the strategic development of the Dubai civil aviation sector: Government, passengers, the civil aviation authority, the airlines' company, and the airport management company. Every stakeholder has a different perspective of sustainability, and the purpose of understanding the role of stakeholders is to maximize beneficial impacts on an initiative, organization, or collaboration while reducing adverse effects. To be successful, stakeholder engagement should be continuous, allowing for the transfer of insights into the company's development.

Third, the study's results enable the adequate consideration and equitable inclusion of key stakeholders' interests in developing a strategy for securing the sustainability of the

civil aviation sector in Dubai. The analysis identifies optimal ways of stakeholder engagement in the decision-making process of sustainable development strategy in the civil aviation sector in Dubai.

In addition, the aviation industry is a worldwide enterprise that adheres to the global sustainability criteria established by various worldwide agencies. However, the primary emphasis of the worldwide authorities is on the preservation of the environment; therefore, the organizations also work to improve sustainability inside aviation firms. The current study concentrates on three different types of sustainability, namely economic sustainability, social sustainability, and environmental sustainability. These three types of sustainability would be used to direct Dubai's civil aviation sector, which is one of a kind in the field of research and is, therefore, the subject of the study. Additionally, since Dubai's aviation industry is one of the largest and most modern industries, it must provide the best in sustainable business practices to maintain its position as a global leader.

Also, the current research significantly contributes to the field of study related to the sustainability of the aviation sector. Many researchers have conducted research to improve sustainability in the aviation sector using a more empirical approach or in terms of technological advancements. However, using AHP in the current research would help prioritize the sub-indicators of the leading indicators, such as social, economic, and environmental sustainability. Also, the sustainability indicators and their sub-indicators would be a significant academic contribution as the research can be carried out with each indicator. The current study leads to developing specific sub-indicators of sustainability in

Dubai's aviation sector, which is a unique contribution to academic research. Previous studies have outlined the three leading sustainability indicators in their studies (economic, social, and environmental). However, the sub-indicators of the aviation sector have been identified and prioritized only in the current research with an intensive secondary and primary data analysis, making it unique research.

Additionally, the academic researchers are also the decision-makers in companies who act as consultants for the aviation sector in the research and development teams. So, the current research can also help academic researchers to understand these sustainability indicators individually, which can further support the civil aviation sector to consider those aspects accordingly.

Lastly, the AHP model is **modified** to correspond to the sustainability requirements of Dubai's civil aviation sector, which industry practitioners can utilize further. Extensive sub-indicators have been identified for each sustainability indicator, which can serve as a base for knowledge formation and analysis.

1.7 Practical Contributions

The precise identification of the sustainability criteria and indicators important for stakeholders of the Dubai civil aviation sector is vital for developing future sustainable development strategies for the sector. Based on the detailed conceptualization of sustainability in the Dubai civil aviation sector, the definition of critical categories of

stakeholders and the identification of the main tools of stakeholders' engagement for the aims of sustainable development of the sector in the future will be an essential scientific basis to facilitate more inclusive decision-making for effective outcomes of new policies and procedures in the civil aviation sector. The comparison of different vital stakeholders' positions on the sustainable development of the civil aviation sector in Dubai demonstrated differences in their perception of sustainability values and dimensions, which must support civil aviation management in implementing specific sustainability interventions. For instance, the civil aviation authorities might not be able to identify which sustainability aspects are important for passengers. However, the current research could help them to analyze the sustainability indicators from a passenger perspective. Also, by doing this, Dubai's civil aviation sector can satisfy all its stakeholders, increasing their loyalty to the industry.

At the same time, the study's findings can be of practical use for stakeholders themselves. From the perspective of the regulatory authority in Dubai, the assessment of different perceptions of sustainability presented by critical stakeholders can contribute to sustainability promotion in the sector with the help of regulatory measures and requirements. Various stakeholders can cooperate and form powerful coalitions that enable them to communicate and discuss sustainability factors, which they can further integrate and implement with the sustainability policies. Also, the integration of positions and interests of different stakeholders can lead to the development of new forms of Dubai and federal laws, which would contribute to the successful satisfaction of stakeholders' needs in the civil aviation sector of Dubai.

The results of the present study would contribute to the conceptualization of sustainable development problems in the Dubai civil aviation sector. Based on the realization of the stated research objectives, it must be possible for researchers and practitioners to define the main elements of the sustainable development process in the civil aviation sector. This knowledge is for science-based decision-making in creating sustainability strategies for organizations in the civil aviation sector in Dubai.

1.8 Research Plan

The research plan is divided into three main sections to help achieve the stated study objectives. Exploratory research, qualitative research using the narrative method to gather data from focus groups, and analytical hierarchy process (AHP) analysis to perform prioritization that helps with decision-making. The summary of the research plan and all the performed activities are presented in Figure 1.

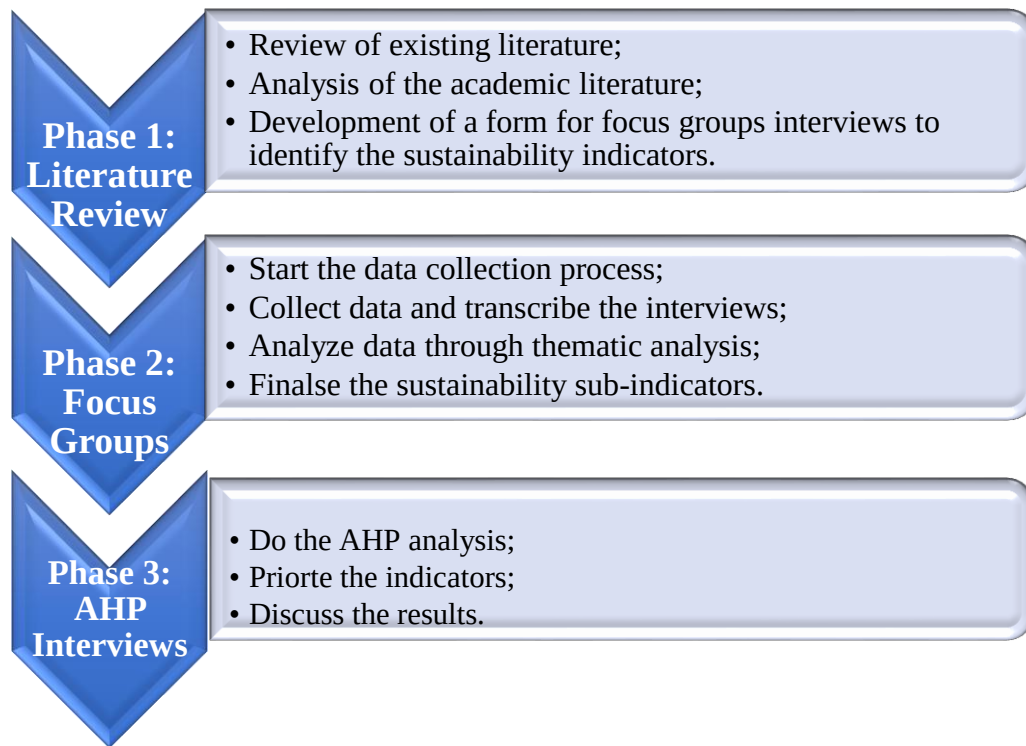


Figure 1: Research Plan

The study's first phase was a narrative literature review that helped the researcher identify some of the leading sustainability indicators and sub-indicators already discussed in the existing literature. The narrative literature reviews' findings helped identify the specific fundamental indicators (factors) of sustainability in the civil aviation sector for the different categories of stakeholders. Moreover, the narrative literature review results served as a basis for the form provided to the participants of the focus groups (part of qualitative research) that helped assess the relevance of the specific sustainability indicators to different categories of stakeholders in the Dubai civil aviation sector. Also, the categories of stakeholders were identified from the narrative literature review along with the use of the stakeholder theory.

The second phase of the study, which includes qualitative research methodology that was conducted using focus groups, included an analysis of the conceptual framework of critical indicators, which will contribute to the identification of stakeholders' expectations in the Dubai civil aviation sector. This phase also helped identify the factors that need to be considered or removed from the study. Stakeholders representing different groups interacted to identify if some indicators needed to be excluded or added. The findings of the qualitative study were further summarized and presented in the form of the conceptual framework, which served as a basis for defining the critical indicators of multidimensional sustainability in the civil aviation sector.

The third phase of the research was conducting interviews as a part of the AHP model, which helped rank the indicators and sub-indicators based on the participants' responses. The data collection procedure These participants were selected from a total of 148 participants in the focus groups based on specific criteria, which are discussed in section 3.6.3. In this phase, social, environmental, and economic sustainability indicators were analyzed using the AHP model. AHP was conducted to prioritize indicators, which significantly helps the decision-making process. AHP model may establish a hierarchy of importance or weights for criteria and choices regarding the contrasting assessments. The priority of leading indicators was calculated along with the social, environmental, and economic sustainability sub-indicators.

1.9 Structure of the Dissertation

The structure of dissertation is organized into six main sections. The main sections addressed in the dissertation included the following: introduction, literature review, methodology, results, discussion, and conclusion.

The literature review section served the aim of summarization of the results of pre-performed studies in the chosen research domain. The findings of the literature review served as an essential basis for the development of the study methodology.

The study's methodology section presented the study's research design and philosophy, the specific data collection and analysis methods applied in the research conditions, and the study sample's parameters. The study's results section presented the data collection and analysis procedure outcomes. The dissertation's discussion and conclusion sections developed and presented the essential findings and implications of the research, which were casually related to pre-defined research questions and objectives.

1.10 Summary

The study's introduction section defined the following aspects of the dissertation: background, research problem, research questions and objectives, significance of the study, theoretical and practical contributions, and the research plan. Discussing the background and research problem gave the audience a clear vision of the study scale, domain of interest, and problems that would be addressed in the study context. Research questions and objectives provided a basic understanding of the potential outcomes of the study and issues that would be solved during the study. The discussion of the study's significance is

essential from the perspective of assessing the potential effects of the study results and the importance of the study questions resolution for the future of the Dubai civil aviation sector. The discussion of the research plan contributed to the identification of the research methodology used in the study process.

2 Background Discussion and Literature Review

2.1 Chapter Introduction

The current chapter discusses the development of the civil aviation sector nationally in the UAE and internationally. Furthermore, it focuses on the concept of sustainability and how important it is in the aviation sector. The chapter also outlines the role of stakeholders in maintaining sustainability in the aviation sector. The nature and behaviour of stakeholders vary based on the type of sustainability being focused upon. Three primary sustainability indicators are discussed such as environmental sustainability, economic sustainability, and social sustainability. Along with this discussion, the role of stakeholders in promoting these sustainability indicators is also discussed. Lastly, the study's framework and theoretical background are highlighted.

2.2 Civil Aviation Sector Internationally

The immediate context of the study includes Dubai's civil aviation sector. The civil aviation sector is one of two major flying categories representing private and commercial non-military aviation sectors. The main categories of services in the civil aviation sector are scheduled to air transport and general aviation. As a critical objective of this research, the orientation of the civil aviation sector requires careful assessment of the current role and future development trends in this economic sector. First, it is significant to highlight that the civil aviation sector serves as one of the essential pillars of economic and social growth in the modern world. Its development substantially impacts a wide range of directly

engaged stakeholders, including “manufacturers, passengers, freight, airport & services, aviation services, governments, and air transport sector” (ILO, 2013, p.2). In particular, the civil aviation sector's effective growth should be considered a sustainability factor for all the mentioned industries and sectors of the economy. An understanding of the role of civil aviation in modern society requires a brief description of the industry. According to relevant statistics, the global civil aviation sector includes “over 1,303 scheduled airlines, over 31,717 aircraft in service, 3,759 airports, and 170 air navigation services providers” (ACI, 2019, p.13). In 2018, the worldwide civil aviation sector facilities carried around 4.3 billion passengers, logging 8.3 trillion in revenue (ACI, 2019, p.11). With this, 58 million tons of freight were effectively transported worldwide, 40% of world trade by value (ACI, 2019, p.11). These results make civil aviation a vital element of contemporary global economic operations.

Additionally, to assess the overall importance of the civil aviation sector for the modern economy and society, it is crucial to consider its critical economic and social benefits. In this context, the expert community has defined the following impacts: direct, indirect, induced, and catalytic (ACI, 2019). Regarding the direct implications of civil aviation operations, the major ones are employment opportunities development and the generation of a significant part of the national GDP (ACI, 2019, p.17). Regarding the indirect impacts, it is essential to mention the generation of economic benefits for sector stakeholders and indirect employment opportunities (ACI, 2019, p.18). Overall, indirect benefits were assessed at the US \$638 million in 2016 (ACI, 2019, p.18).

Regarding the induced impacts of the sector's development, they include the mandatory creation of workplaces in related sectors of the economy. Generally, they amounted to the US \$454 billion (ACI, 2019, p.18). Finally, regarding the catalytic impacts of the civil aviation sector development, they include the support of sustainable operations of a wide range of industries that rely on timely delivery of goods, support of international investment activity, and encouragement of innovations (ACI, 2019, p.19). The role of the civil aviation sector in supporting global tourism and global trade should also be highlighted.

Together with the economic impact of the civil aviation sector, the social role of this sector should be considered. The critical social benefits of civil aviation include a safe connection between business and people and improved citizens' quality of life (ACI, 2019). Altogether, the growth of the civil aviation sector is a source of significant opportunities for a wide range of engaged stakeholders.

While civil aviation sector development can impact the social development of the UAE's society, it is essential to consider future trends in sector development and the associated opportunities developed in the social sector. The civil aviation sector development trends are pretty contradictory and can seriously impact engaged stakeholders. First, the number of passengers travelling is expected to increase from 2.7 billion in 2010 to 5.9 billion in 2030 (ILO, 2013, p.23). Furthermore, direct jobs are expected to rise from 8.36 million to 12.1 million (ILO, 2013, p.23). The COVID-19 crisis reduced results because the overall reduction of the number of seats offered by airlines in

2020 ranged from 32 % to 59 % in 2020 (ICAO, 2020). The global civil aviation sector will most likely require additional time to restore operations, which makes the earlier presented forecast quite unrealistic in the future. The ILO performed a detailed analysis of the sustainable improvement of civil aviation sector operations (ILO, 2013, p.24). Reduction of CO₂ emissions and improvement of the quality of customer services are considered critical future priorities of the sector. Enhancing cooperation with employees in the civil aviation sector will become a part of reform initiatives (ILO, 2013). At the same time, the long-term development of the civil aviation sector will depend on several drivers of change, summarized in Figure 1 (IATA, 2018, p.6). As can be seen, the growth of the civil aviation sector is related to a wide range of opportunities and risks, and the question of sustainability will play a significant role in its future.

Drivers of change

Society	Technology	Environment	Economy	Politics
• Terrorism • Urbanization and the growth of megacities • Passenger identity and fraud • Global aging • Middle class growth in China and the Asia-Pacific region • New modes of consumption • Tensions between data privacy and surveillance • Global population growth driven by Asia and Africa • Shifting ethnic, political and religious identity • Disability, fitness and health	• Cybersecurity • Expanding human potential • Robotics and automation • 3D Printing and new manufacturing techniques • Virtual and augmented reality • Internet(s) of Things • Alternative fuels and energy sources • New aircraft designs • Alternative modes of rapid transit • Geospatial technology	• International regulation of emissions and noise pollution • Resource nationalism • Personal carbon quotas • Water and food security • Environmental activism • Extreme weather events • Rising sea levels and reclaimed habitats • Human-controlled weather • Circular economy • Infectious disease and pandemics	• Global income inequality • Strength and volatility of global economy • Price of oil • Level of integration along air industry supply chain • Shift to knowledge-based economy • Privatization of infrastructure • Concentration of wealth into a "Barbell economy" • Unionization of labor and regional independence • Open data and radical transparency • Changing nature of work and competition for talent	• Bribery and corruption • Geopolitical (in)stability • Government ownership of airspace and critical infrastructure • Strength of governance • Anti-competitive decisions • Defense priorities dominate civilian needs • Shifting borders, boundaries, and e sovereignty • Increasing influence of alternative regional and global institutions • Trade protection and open borders • Rise of populist movements

Figure 2: Drivers of Change in the civil aviation sector

(Source: IATA, 2018, p.6)

2.3 Civil Aviation Sector in the UAE

2.3.1 Development of Civil Aviation Sector in the UAE

While the civil aviation sector serves as a severe catalyst for economic growth worldwide, it is a significant factor for the UAE's economy and Dubai in particular. In 2019, experts expected the civil aviation sector to generate 20% of the country's GDP compared to 15% in 2018 (John, 2018). The expert community assessed the impact of the civil aviation sector on the UAE economy for 2020 at the level of AED 200 billion (John,

2018). Moreover, specialists expected the civil aviation sector to provide up to 750'000 jobs in the UAE (John, 2018). Overall, the capacity of the UAE civil aviation sector represents about 45% of the overall aviation sector capacity in the Arab world, placing the country in the leading position regarding air transport sector development in the region. Together with direct economic benefits for Dubai, the civil aviation sector growth has contributed to the adequate diversification of the state and Dubai's economy (Schiliro, 2013). Specifically, Dubai has demonstrated the highest effectiveness in economic diversification due to the successful development of the civil aviation sector (Schiliro, 2013). It has led to the growth of the tourism sector and international investment activity in the UAE.

The UAE's civil aviation sector's critical role can also be observed based on recent initiatives and projects. At the beginning of 2020, the most important news was the information ahead of the Global Investment in Aviation Summit (GIAS 2020) that the UAE had already invested US \$270 billion in developing the civil aviation sector (Arabian Business, 2020). Together with allocating additional financial resources, the UAE government and other private and public sector businesses targeted integrating new technologies in the sector. The innovative solutions currently offered for the civil aviation sector in the UAE include the ONE ID passenger identification concept and the latest technology of the civil aviation sector performance tracking to improve service quality and reduce security risks (Dubai Airshow, 2019). Finally, the Government of Dubai (2020) has issued a plan for artificial intelligence (AI) technology development that should play a role in optimizing the quality of the civil aviation sector services in the future. Among the ways

of governmental support for the civil aviation sector, the Government of Dubai has made decisions to realize the needs of the civil aviation sector business. First, the reduction of landing fees for private jets was rejected (Government of Dubai, 2018, p.42). At the same time, the decrease in tax pressure and the attraction of foreign investors to Dubai are considered important initiatives (Government of Dubai, 2018, p.42). Overall, the civil aviation sector served as a severe source of economic development for the UAE.

2.3.2 Contribution of the Civil Aviation Sector in Dubai

The definition of the role of the study theme must include an estimation of the impact of the civil aviation sector on the economy of Dubai. Together with this, it is functional to demonstrate that the improvement of the civil aviation sector plays a crucial role in the social development and well-being of Dubai and the UAE's society. Overall, the sustainable growth of the civil aviation sector in Dubai must be associated with the generation of significant social and economic impact for different categories of the population in Dubai.

From the economic impact of the civil aviation sector, it was stated earlier that it could provide direct and indirect benefits for various stakeholders in Dubai. It is valuable to provide specific information supporting the general argument. Most important, the structure of Dubai's gross domestic product (GDP) must be assessed from the point of the role of the civil aviation sector in it. According to the relevant statistical data summary, the share of transportation and storage sectors in the GDP of Dubai equalled 12.2 % in 2019 (Dubai Statistics Center, 2020b). It is essential to show that the transportation sector

includes different types of transport and is not limited only to the civil aviation sector. Nevertheless, the assessment of the transport sector structure in Dubai demonstrated that civil aviation plays a significant role in it from the point of economic and social impact.

According to relevant statistics, air transport is the leader in the transportation sector of Dubai from the point of added value generation. From this perspective, the added value of air transport in Dubai equalled AED 25'761'469 in 2018 or approximately 52 % of the total added value of Dubai's transport and storage sector (Dubai Statistics Center, 2020a). The role of the civil aviation sector in intermediate consumption generation for the transport sector of Dubai equalled 73.6 % in 2018 (Dubai Statistics Center, 2020a). The civil aviation sector in 2018 contributed to the generation of 51.6 % of compensation for workers engaged in the transport sector of Dubai. However, the share of workplaces generated by the civil aviation sector was 17.25 % (Dubai Statistics Center, 2020a). This data demonstrated that the civil aviation sector significantly improved living conditions for engaged employees, guaranteeing a considerably higher compensation level than a significant part of other transportation sectors in Dubai. The share of total output generated by the civil aviation sector for Dubai's transport and storage sector in 2018 equalled 66.6 % (Dubai Statistics Center 2020 a). Overall, the civil aviation sector contributed seriously to Dubai's successful economic development.

With the direct economic and social impacts of the civil aviation sector, it is valuable to estimate the indirect implications of this sector's performance. Tourism is the critical sector that benefited from the growth of the civil aviation sector in Dubai. Due to

Dubai's geographic location and characteristics, air transport has become one of the main instruments of tourists travelling to the emirate. Without air transport infrastructure, tourists would not be able to visit Dubai in such a volume. The indirect impact of the civil aviation sector can also be observed in the sectors of retail and wholesale, accommodation and food service sector, real estate, arts, and entertainment sectors, which together took more than 40 % of Dubai's GDP in 2018 (Dubai Statistics Center, 2020b). As for the specific sectors that benefit from the civil aviation sector, such as tourism, food and beverages, hospitality, and others, the change in hospitality facilities volume in Dubai can be provided. During 2017-2019 in Dubai, the number of hotel rooms The average occupancy level in the hospitality sector in 2019 equalled 83%, a significant contribution to the civil aviation sector (Dubai Statistics Center, 2020d). The indirect economic impact of the civil aviation sector is significant.

Finally, it is essential to remember that the population of Dubai is highly heterogeneous. In 2019, only 7.8 % of the Dubai Emirate population were Emirati residents (Dubai Statistics Center 2020 e). More than 90 % of the population in Dubai, mainly contributing to the production of GDP, and economic and social welfare of the emirate, are non-residents. These people require a stable transportation infrastructure provided by the civil aviation sector, and the civil aviation sector is vital for Dubai's long-term success and development.

It can be observed that Dubai's civil aviation sector is a significant part of the UAE's economy, so it is essential to maintain its sustainability. Before discussing different

sustainability aspects, it is crucial to highlight the importance and nature of sustainability in terms of economy, environment, and other factors. The nature of sustainability is discussed in the following section.

2.4 Importance of Sustainability in the Aviation Sector

2.4.1 Nature of Sustainability

The current research analyzes the role of sustainability in projects that contribute to the growth of the civil aviation sector. Therefore, it is essential to provide a detailed and complex definition of sustainability and apply it to the specific operations of the civil aviation sector. First, it is necessary to highlight that the purpose of sustainability can vary, and it depends on the specification of human activity where the term itself is used. In general, the term “sustainability” is causally related to the idea of development in different types of organizations (Moore et al., 2017). Thus, experts consider sustainability as a form of expression for the time function of an object. That is why these two terms cannot be considered separately.

Since the realization of sustainability is causally linked to development, the term “development” requires a clear definition. In this aspect, we considered the term “development” in organizational development, specifically organizations operating in the civil aviation sector. Researchers identified the idea of development as “an evolutionary process in which the organizational capacity increases in terms of initiating new structures, coping with problems, adapting to continuous change, and striding purposefully and

creatively to attain new goals” (Mensah & Casadevall, 2019, p.4). Various definitions of the term consider development as a process aimed at maximizing benefits for a subject or business, stabilizing the exchange between subjects and organizations, and reducing associated risks.

The primary definition of sustainability is the ability of the subject or organization to maintain its entity despite the potentially disruptive influence of the environment and internal factors. The term “sustainability” is directly related to the term “development” and the notion of entropy. From the position of a subject and structure development, entropy is considered a permanent process of useless energy accumulation, leading to the chaotization and generation of disorder in operations of any type of mechanism or business (Popovic, 2018). The objective tendency of increasing disorder in any subject's functions is a serious factor that should be taken into account in managing that subject, following this vision of the process of the subject's or organization's development. Effective management and leadership aim to minimize entropy's potential negative impact on the subject or business and guarantee the system's long-term balance.

As regards the definition of sustainability itself, different positions have been developed by researchers and experts in various domains of human activity. First, the viewpoint of the Brundtland Commission, where the term was initially introduced, should be considered. According to it, sustainability is the process of “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (University of Alberta, 2018). The key characteristics of sustainability are its

complex and diversified nature, cross-generational equity, and the orientation to the dynamic equilibrium state as the key objective (Mensah & Casadevall, 2019, p.5). Sustainability is causally related to stability in the long-term development of any subject or organization (Emas, 2015, p.2). United Nations have defined sustainability as "filling the demands of today without jeopardizing previous descendants' capacity to fulfil their requirements" (United Nations, 2020). In addition, the sustainability definition in UAE's SDG Report (2016) focuses on environmental stewardship and sustainability. The report mentions that living within the limits of our environment will become more intertwined with creating possibilities for future successive generations and societies in the years ahead, which is referred to as sustainability. Even though the world's population and cities are expanding rapidly, there is much potential for creative solutions to guarantee that this expansion is both healthy for the planet and human well-being while minimizing global inequalities. With the general definition of sustainability, it is functional to consider sustainable development's primary forms and rules. The current research has considered UAE's sustainable development-related definition as Dubai's aviation sector needs to be developed to be safe for future generations and increase the economic scope for them in the long run.

One of the most critical elements of sustainable development is the principle of orientation on different dimensions of sustainability. Researchers identified the following dimensions and forms of sustainability: economic, environmental, ethical, and social (John & Narayanamurthy, 2015). The concept behind the definition of various forms of sustainability was that such differentiation should also highlight the interdependence and

interconnectedness of various human activities and their impact on organizations and the environment. Simply put, it was necessary to outline that social sustainability could not be achieved without economic sustainability, and both forms depend on environmental sustainability (Greco & Jong, 2017, p.10). We presented the interconnection model between primary sustainability forms in Figure 2.

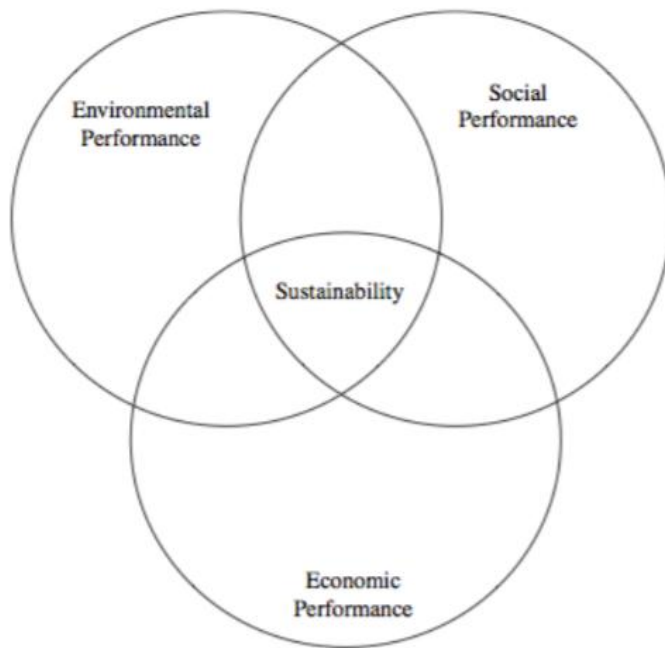


Figure 3: Sustainability Model

Source: Kotob, 2015.

Figure 2 shows the classic Carter & Rodgers Sustainability Model, which highlights the importance of a complex attitude to the issue of sustainable development of organizations. The lack of interest in specific aspects of sustainability caused challenges

and risks in the operations of organizations and the accumulation of negative environmental impact.

Economic sustainability is the state of the production and service delivery system that guarantees a stable and effective fulfilment of modern society's consumption needs, providing sufficient opportunities for future generations. We highlighted the economic sustainability problem separately due to the identified limits of natural resources, challenges of uncontrolled growth and consumption, and the importance of the balance of production, distribution, and consumption in the economic system (Mensah & Casadevall, 2019, p.9). The researchers have established the imperfection of the conventional economic models oriented only towards maximizing production and consumption levels. Limited natural resources and risks of uncontrolled growth leading to financial crises have led to the development economic sustainability principles and practices (Mensah & Casadevall, 2019, p.9).

Social sustainability aims to create optimal conditions for socialization and the self-realization of each member of society. The researchers considered the concept of social sustainability on the notions of “equity, empowerment, accessibility, participation, cultural identity and institutional stability” (Mensah & Casadevall, 2019, p.9). Regarding economic and environmental sustainability, achieving social sustainability objectives presupposes the state when each member of society can reach their self-realization goals, avoiding risks of inequality, poverty, or discrimination.

Finally, the environmental sustainability concept focuses on maintaining the natural environment stability and preserving a sufficient number of natural resources for future generations. Sustainable development objectives include the functional application of natural resources and the minimization of the negative impact of human activity on the environment (Mensah & Casadevall, 2019, p.10). Overall, the connection between different forms of sustainability leads to optimal conditions for social development.

It is important to remember the existing risk of tensions and challenges of integrated sustainability due to its complex and interconnected nature. Integrated sustainability is the term applied to describe the interconnection between different aspects of sustainability in modern organizations – economic, social, and environmental. The nature of this problem is that the practitioners' decision to reach effective development based on the integration of objectives for different forms of sustainability might not always result in desired positive outcomes (Giovannoni & Fabietti, 2014, p.29). In certain conditions, the fulfilment of objectives of the economic sustainability of organizations is strongly connected with social sustainability but can lead to adverse outcomes as regards environmental sustainability. The need to search for a balance among three key dimensions of sustainability is a common issue in sustainable development, and the specialists should be capable of effectively responding to the potential challenges.

2.4.2 Role of Sustainability Indicators in Enhancing Sustainability

Identifying ways of sustainable development in the civil aviation sector in Dubai must be based on a clear definition of the main tools and instruments that must be applied

in this context. Among the various approaches, the most reliable strategy is the orientation on the sustainability indicators as a quantitative parameter that can be objectively assessed to identify the level of sustainable development in the civil aviation sector. Without reliance on sustainability indicators, it would be difficult for the management and stakeholders in the civil aviation sector to identify the relevance and effectiveness of applied strategies from the point of sustainable development goals realization. Clear identification of the sustainability parameters that can be used in the civil aviation sector is important.

Identifying sustainability indicators in the civil aviation sector is complicated mainly due to the presence of many engaged stakeholders and the differences in assessing sustainable development priorities among them. The research by Alameri et al. (2017) identified vital categories of stakeholders engaged in the sustainable development of the civil aviation sector, their values, and priorities that can be estimated as a basis for the identification of sustainability indicators in the civil aviation sector. According to the study findings, three categories of sustainability indicators were identified for the civil aviation sector: economic, social, and environmental sustainability indicators. At the same time, the analysis of key sustainability indicators for different categories of stakeholders demonstrated differences in their perception of sustainability in the civil aviation sector. Identifying the nature of these differences and the importance of indicators unification for the successful engagement of different stakeholder categories is important.

Alameeri et al. (2017) considered the first category of sustainability indicators was oriented toward social sustainability. In this way, civil aviation authorities and airports

provided the highest number of indicators as stakeholders. Among the differences presented by key categories of stakeholders in the definition of sustainability indicators, the civil aviation authority needed to consider political relations among the Emirates as an important indicator, while airports and airlines oriented on job opportunities generation, and passengers demonstrated concerns about the quality of life and safety (Alameeri et al., 2017). Similar differences were established for a comprehensive list of indicators, showing that it is impossible to say that all stakeholders are interested in a matching set of sustainability indicators. The same results were presented for assessment outcomes for economic and environmental sustainability indicators (Alameeri et al., 2017). In conclusion, each stakeholder was concerned about the specific aspects of sustainable development in the civil aviation sector, which differed from the interests of other stakeholders.

This finding highlighted the role of the unification of sustainability indicators to guarantee the satisfaction of stakeholders and their effective engagement for the aims of sustainable development of the civil aviation sector. From this perspective, the resolution of the question about the search for optimal ways of stakeholder engagement for the aims of sustainable development of the civil aviation sector includes the need for unification of sustainability indicators that can be offered to civil aviation sector management to comply with stakeholders' expectations. In these conditions, differences in stakeholders' needs from the point of sustainable development can place the management of the civil aviation sector under challenging conditions, making them choose between separate stakeholders. To avoid this problem, the unification of sustainability indicators must provide a single

solution for all stakeholders and management, contributing to the practical and sustainable development of the civil aviation sector. Hence, it is important to discuss the role of stakeholders and their engagement in maintaining sustainability.

2.5 The Civil Aviation Sector Framework in Dubai

To answer a question about the key stakeholders that must be engaged in the civil aviation sector sustainable development process in Dubai emirate must include the analysis of the aviation framework presented in the emirate. The legal and operational structure of Dubai's civil aviation sector operations must be considered for this aim. The regulatory framework of the civil aviation framework in Dubai was established in the Civil Aviation Law of 1991, which established rules and principles of civil aviation sector performance modification on the territory of the UAE, including the Dubai emirate. The regulatory responsibility in the civil aviation sector of the UAE is concentrated in the hands of the General Civil Aviation Authority (Abeyratne, 2008). This federal institution is supposed to control the development of aviation-related activities in the UAE. This institution cooperates with regulatory institutions of all seven Emirates, setting laws in the civil aviation sector and controlling their proper realization. General Civil Aviation Authority is also responsible for organizing international cooperation with international bodies responsible for developing safe civil aviation practices and rules. An example of such cooperation is the partnership with the International Civil Aviation Organization (UAE-ICAO, 2020), which contributed to developing high-quality security standards in the civil aviation sector of the UAE.

As was earlier stated, the objective of the General Civil Aviation Authority is to establish general rules of civil aviation sector development in the UAE and adapt these principles in cooperation with regulatory institutions of all the Emirates. In the Dubai emirate, the role of the national partner of the General Civil Aviation Authority is played by the Dubai Civil Aviation Authority. This institution was established as an autonomous body oriented toward developing the air transport sector of Dubai and overseeing aviation-related activities in the emirate (Dubai Civil Aviation Authority, 2020). The functions of the Dubai Civil Aviation Authority include the definition of regulatory policy for the civil aviation sector in the emirate, management of the civil aviation sector, provision of requirements for modification of civil aviation facilities and infrastructure, the establishment of bilateral and multilateral agreements with international partners in the civil aviation sector, licensing of foreign air transport providers in Dubai emirate, and to provide General Civil Aviation Authority with regular reports about its progress in the domain of civil aviation sector security and safety in Dubai (Dubai Civil Aviation Authority, 2020). Overall, the Dubai Civil Aviation Authority is an autonomous body that cooperates with the General Civil Aviation Authority and provides optimal conditions for civil aviation sector development in Dubai.

Together with the institutions that fulfil regulatory functions, it is functional to consider the actors responsible for developing and providing civil aviation services in Dubai. The stakeholders in this domain include airline operators and airport companies (Alameeri et al., 2017). These two actors of the aviation framework in Dubai work in direct cooperation, successfully generating opportunities to provide air transport services to

different customer categories. Airlines operators are responsible for the realization of air transport services in the civil aviation sector, while airport companies develop appropriate infrastructure for the organization of air transport services. These types of stakeholders can operate only through indirect cooperation since the operations of a single one makes no sense without another one. Overall, the civil aviation sector in Dubai is presented by several stakeholders, each fulfilling a specific function in the industry's structure.

From the above discussion of the framework, it can be observed that Dubai's aviation sector does not have a specific detailed framework available, which explains how it focuses on sustainability along with a clear perspective of the stakeholders. Still, the Emirate has highly advanced sustainability policies, increasing sustainability's application and importance for the aviation sector. Also, sustainable policies have allowed the aviation industry to achieve some achievements regarding sustainability. However, the country and the Emirate still contribute to high carbon emissions when compared globally and regionally. Also, there are some challenges with the current framework, like a lack of focus on specific sub-indicators of sustainability.

2.6 Role of Stakeholders in the Sustainability Considerations

Together with the discussion of sustainability enhancement project development, the presented dissertation aims to address the problem of stakeholders' effective engagement in the sustainable development of the civil aviation sector in the UAE and Dubai. According to the available position stated in the research, stakeholders are considered the key actors responsible for supporting the management of the civil aviation sector

companies in sustainability enhancement projects planning and realization. Such a position might raise questions about the arguments behind such a vision. It is crucial to provide a detailed discussion of the essential role of stakeholders in the growth of competitive and efficient business activity and the realization of principles of sustainable development.

Before discussing the stakeholders' role in realising the sustainable development strategy, it is crucial to study and discuss the complex role they play in the development of competitive and efficient business activity in general. The comprehensive list of stakeholders related to the operations of the civil aviation sector was mentioned earlier. It includes the following actors: "manufacturers, passengers, providers of freight, airport and aviation services, governments, and employees in the air transport sector" (ILO, 2013, p.2). In this dissertation's context, additional stakeholders have been identified: state authorities (UAE Ministry of Economy), competent aviation regulators (the civil aviation sector Authority), airport companies, airline operators, and passengers. The main characteristics of the stakeholders are that their performance affects and is impacted by the progress of business development. From this perspective, the organisation's successful operations depend on the stakeholders' position and behavior, which can be further explained by stakeholder salience theory, which is discussed in sections 2.10.5 and 2.10.6.

It is crucial to identify the characteristics of critical categories of stakeholders selected for the aims of engagement in the process of civil aviation sector sustainable development in Dubai. The list of targeted stakeholders included the following actors: the UAE federal government (General Civil Aviation Authority, 2020); Dubai civil aviation

authority (Government of Dubai, 2020); airport companies of Dubai (Dubai Airports, 2020); airlines in Dubai and passengers travelling from and to Dubai. Hence, it is important to describe the role and potential impact of each of the presented stakeholders for Dubai's civil aviation sector.

The federal government's role in the Dubai civil aviation sector's sustainable development is related to the definition of regulatory requirements for business performance and the development of regulatory and fiscal support for business. The engagement of this category of stakeholders is important since it can create the basis for the successful sustainable development of the industry. The aspect of Dubai civil aviation authority this institution is responsible for the regulatory control over the performance of the civil aviation sector in Dubai, which makes companies adapt to its requirements and regulations. The influence of airport companies of Dubai and airlines in Dubai on the development of civil aviation authority is based on the engagement of these types of organizations in the performance of the civil aviation sector. They form the basis of the civil aviation sector, and the realization of sustainable development goals is based on their readiness to apply sustainable practices in their performance. Finally, passengers can be considered the key party that is taking part in the consumption of the civil aviation sector services, making them an influential party that can pressure the development trajectory of the civil aviation sector. The engagement and cooperation of mentioned stakeholders were an important source of sustainable development in the civil aviation sector.

It is crucial to provide a detailed understanding of the role of stakeholders in the sustainability considerations for the civil aviation sector in the UAE, and it is important to consider different notions of their influence on competitive and efficient business activity operations. Benn et al. (2016) focused on identifying factors a company depends on regarding its stakeholders' position. Stakeholder's position is the term applied to summarize the interests and needs of specific stakeholders – their expectations, requirements to the organization, and other such aspects (Benn et al., 2016). Among the attributes that were found to be important, the following were highlighted: power, legitimacy, and urgency. The power parameter is applied to determine the relationship among parties in their cooperation. The stakeholders' role lies in the fact that they can influence the decision-making process in the organization. For example, the customers' decision to avoid purchasing products due to the company's irresponsible environmental policies can force a business to consider environmental sustainability in its operations. The parameter of legitimacy is used to characterize the actions of a business regarding its stakeholders from the position of social and public acceptance (Benn et al., 2016, p.3). The management's actions in any organization must be considered socially acceptable by all the engaged stakeholders for a company to succeed. In this context, the stakeholders' influence on the process of sustainability consideration in the organization can relate to establishing cultural and public norms and requirements for business. For example, customers and suppliers can set specific social norms concerning the model of the company's behaviour (Benn et al., 2016). The decision not to follow these requirements is likely to lead to a

situation when these categories of stakeholders reject an offer for cooperation, which will lead to the failure of the business.

Finally, the parameter of urgency is applied to characterize the level of urgency required from an organization to react to the claims of specific stakeholders (Benn et al., 2016, p.3). For instance, if the company is not highly dependent on the group of suppliers, it is possible to ignore their claims until a specific moment. At the same time, in this case, it is highly dependent on the specific category of customers; it is obligatory not only to react to their claims rapidly but even to predict future changes in their expectations. The analysis of the mentioned attributes of stakeholders demonstrates that they play an essential part in the planning and decision-making of companies. Organizations' management must adapt to the stakeholders' perceptions and expectations, which also defines the stakeholders' role in the sustainability consideration process.

Together with the direct impact of stakeholders on the success of the company's performance, it is necessary to assess the factors of indirect influence of their position and activity on business perspectives. The reputational impact should be carefully considered. Corporate reputation, which can also be considered one of the organisation's critical resources, is the product of the cooperation between a company and its stakeholders (Matuleviciene & Stravinskiene, 2015, p.77). From this perspective, the company is interested in maintaining strong and positive relations with stakeholders. If the management ignores the stakeholders' needs, the corporate reputation resource will remain low, limiting opportunities for business expansion. From the position of corporate

reputation improvement, the management of the civil aviation sector must be interested in the involvement of stakeholders in the process of sustainability consideration.

The earlier discussion about the impact of stakeholders in the sustainability consideration has pointed out that organizations depend on the decisions and actions performed by their stakeholders, making them analyze the stakeholder's position in the sustainable development planning process. From this position, it is crucial to consider the advantages the organization can receive because the stakeholders participate in the process of sustainability consideration. Potential benefits of such a form of cooperation include resources, reputational advantages, and opportunities for effective mitigation of risks in sustainable development.

Sustainable development is usually related to the introduction of significant changes to the current business model, which is also associated with high costs for the company. Silva et al. (2019) showed that the active integration of stakeholders using ways of communication and cooperation between stakeholders and business management at an early stage of responsible innovation development could reduce risks for the project and organization in general. From this perspective, the discussion of stakeholders' positions about the sustainability project can increase their satisfaction with the result and the probability of the project's financial success, as well as bring about reputational benefits for the organization.

The outcomes of the analysis demonstrate a significant role played by stakeholders in the process of modern organizations' development. The effective mitigation of potential

risks for business growth requires the management of companies to consider the position of stakeholders as an essential factor during decision-making (Kaplan & Mikes, 2012). Since the researchers associate decision-making for sustainable development with high costs and risks, the management should be interested in analysing the stakeholder's viewpoints, expectations, and reactions to the final decision regarding sustainable development. So, the stakeholders' participation in the sustainability consideration process should be considered an essential factor of ultimate success in this activity.

2.7 Sustainability Configurations in the Civil Aviation Sector

The discussion of separate parameters mentioned in the research questions and objectives demonstrated the importance of sustainable development for the effective growth of the civil aviation sector in the UAE and Dubai. At the same time, realising this goal requires the effective planning and fulfilment of separate tasks and projects, which should be based on a defined set of parameters and indicators. It is functional to consider key sustainability configurations applied in competitive and efficient business activity and highlight the specific parameters that are effectively applied under the conditions of the civil aviation sector.

The definition of sustainability configurations requires the discussion of one characteristic of sustainability that is important specifically for business practice. The corporate social responsibility (CSR) parameter describes the company's motivation and readiness to react to the stakeholders' needs in its performance (Bansal & Desjardine, 2014). Although experts regard CSR initiatives as a form of business sustainability, Bansal

& Desjardine (2014) argued that focusing on CSR as the configuration of sustainability is not a reliable answer to the problem of business sustainability because it typically aids in the achievement of short-term development goals while business sustainability development is always a long-term process. Another parameter of sustainability that is useful for assessing business performance is organizational resilience – the ability of a company to overcome shocks (Bansal & Desjardine, 2014). Still, it is an important parameter of sustainability. In addition, it is important to assess an organization's ability to satisfy the stakeholders' needs through improving results for the critical sustainability indicators (Feil et al., 2019). From this perspective, researchers analyze sustainability indicators as the expression of essential values followed by stakeholders in the process of sustainability promotion in an organization (Marques, 2020). The ability of the company to satisfy stakeholders' needs defines the level of satisfaction. One more important parameter that must be taken into consideration is a sustainable business model. The business model consists of an aggregated presentation of key elements of a business structure, their connections, and the form of value generation in the company (Geissdoerfer et al., 2018). The modernization of this term and development of a sustainable business model implies the model that “incorporates pro-active multi-stakeholder management, the creation of monetary and non-monetary value for a broad range of stakeholders, and which holds a long-term perspective” (Geissdoerfer et al., 2018). This definition explains the current approach to realising sustainability in business organizations. It includes significant parameters of the focus on stakeholders' needs, generation of monetary and non-monetary value, and long-term orientation of the program. Together with these characteristics of

sustainability configuration, the following can be considered relevant: orientation on costs minimization, maximization of social and environmental benefits, minimization of waste, emphasis on delivery of functionality and experience instead of product ownership, collaboration and sharing experience (Bocken et al., 2014). A significant part of these principles has been effectively applied in the Nestle Corporation (2002). This argument demonstrates the relevance of the defined components of sustainability configuration.

In addition to discussing the general configuration of sustainability applied in a competitive environment and efficient business activity, it is important to identify the specific characteristics of sustainability that are relevant to the civil aviation sector. First, we consider the character of sustainability challenges common to the civil aviation sector. In this context, the relevant studies and strategies of different civil aviation sector services providers in the sustainability domain share reliable knowledge that can be applied to form a general understanding of the existing situation (Ochieng & Zuofa, 2015). Another vital characteristic includes sustainability indicators that are relevant for each separate stakeholder. The role of sustainability indicators is based on defining the main priorities and values for each category of stakeholders. In this way, they can serve as the key objectives in different sustainability segments in the civil aviation sector. These will include economic sustainability – cost-effective transportation; social sustainability – improvement of living standards for stakeholders; financial sustainability – generation of sufficient funds for the civil aviation sector operations; and environmental sustainability – integration of environmental concerns in aviation (Lutte & Bartle, 2016, p.2). The

realization of these objectives should be considered as the core of the sustainability configuration in the civil aviation sector.

With the core objectives defined earlier, specific goals in the civil aviation sector sustainable strategies should be mentioned. They can differ among countries. For example, in the UK, they include the following: positive social and economic outcomes; climate change impact reduction; noise reduction; local air quality improvement; surface access improvement; practical application of natural resources; and total sector commitment to the realization of sustainability initiatives (Larsson et al., 2018; Sustainable Aviation, 2015; Ryley et al., 2013). The problems of waste and pollution, space utilization and noise have also been relevant in the sustainable development of airport infrastructure (Sameh & Scavuzzi, 2013). Generally, the stated goals can be considered the basic configuration of sustainable development in the civil aviation sector. While discussing the key objectives and goals of sustainable development in the civil aviation sector is important for a general understanding of trends in this domain, it is also necessary to consider examples of sustainable development strategies executed by specific companies. This should provide helpful information about key practices used in the process of sustainability enhancement project development and the fundamental role of stakeholders in this process. Before discussing specific business examples of sustainable development, the technologies commonly applied to improve the environmental impact of aviation should be considered. Agarwal (2012) identifies 25 different technological initiatives to promote green aviation. Among them, the most exciting and promising initiatives include biofuels, advanced composites, fuel cells, geared turbofans, laminar flow wings, close formation flying, quiet

aircraft, solar-powered aircraft, multi-modal airports, greener helicopters, and hybrid ground vehicles. This comprehensive list of technologies that can be applied to guarantee the environmental sustainability of the civil aviation sector points to the complex nature of the proposed changes. Agarwal (2012) is also concerned with whether sustainability considerations in the civil aviation sector provide solutions in various areas, such as reducing resource expenses for operations, minimization of pollution and noise, and optimization of the existing business model. The sustainability problem is addressed in various details and should be considered an integrated element of modern civil aviation.

Finally, the specific examples of sustainable development initiatives applied in civil aviation organizations should be discussed. This will contribute to a complex understanding of sustainability configuration. Kotze (2017) described critical elements of the sustainable development models of Ryanair and SAS airlines. Among the main aspects of their strategies, the following should be mentioned: technological advancement, ancillary services, route network and airport utilization, effective communications and reporting to stakeholders, and balancing short- and long-term objectives. Like the experience of these companies, other business actors concerned with sustainability in the civil aviation sector have also placed stakeholders in one of the most critical positions in the strategy structure (Bertoni et al., 2015). Specific attention is also paid to sustainability assessment and stakeholder reporting (Hahn & Kuhnen, 2013). As regards the assessment of the current progress, companies mainly orient on its complex and transparent evaluation, effective communication, and broad participation of stakeholders in the process (Sala et al., 2015). The direct connection between the scale of business and the level of

stakeholders' engagement for sustainable development has also been identified (Karaman et al., 2018). Altogether, the sustainability configuration assessment results demonstrate the stakeholders' strong impact in all aspects of this process.

It is vital to compare Dubai and other nations and to explain why the research is only conducted in Dubai before highlighting the present study's significant contributions. The emphasis of the present study was on previous research that had been conducted in a different setting. To begin, Londoo-Pineda, Cano, and Gómez-Montoya (2021) carried out research in Colombia centred on sustainability and developed indicators based on the 17 sustainable development objectives of the United Nations. The study was carried out in Colombia. In addition, Kumar and Garg (2017) studied India's automotive industry. In this study, the authors focused on sustainability in supply chains and utilized AHP as their primary research tool.

Research on sustainability in the aviation sector is carried out using the AHP technique in various settings, including India and Turkey, as well as in several other broad contexts. Lin and Li (2011) conducted their study in China, whereby the authors determined various intervention options based on multiple factors for ensuring safety in the aviation industry. However, Chen et al. (2017) have concentrated on establishing sustainability in China based on two sustainability indicators, such as social sustainability and environmental sustainability, whereby the authors focused on examining the impact of various human error intervention approaches on a range of challenging activities. Other studies include Di Gravio et al. (2015) and Ciccone Jr et al. (2008). I also conducted research

in Italy and Brazil, respectively. Also, one of Alam and Dwivedi's studies (2019) conducted in the United States was about sustainable jet fuel.

On the other hand, some publications concentrate on just one of the three indications of sustainability rather than all three. In addition, Dubai is rich in culture because it employs many people from other countries in its aviation industry, has a robust economic climate, and has organizations from various cultural backgrounds. Stakeholders hold different perspectives about sustainability since the environment in which organizations operate varies. For instance, residents in the UAE may have a distinct point of view toward a social sustainability indicator based on their culture and other demographic factors. In contrast, ex-pats may have a particular viewpoint on the matter. As a result, the ongoing study will make it possible to concentrate on all of the universal characteristics that are not greatly different based on demographics and relevant to the industry as a whole, along with all various stakeholders. Additionally, Dubai's aviation industry is trying to concentrate on the long-term viability of the industry as a whole from the points of view of its stakeholders on the three primary pillars of sustainability.

2.8 Nature and Behavior of Stakeholders in the Civil Aviation Sector

The realization of the study objectives is highly dependent on understanding the nature and behaviour of stakeholders in the civil aviation sector. A clear assessment of the stakeholders' potential role in the sustainability enhancement project development should be based on identifying the key stakeholders and their attitude to the sustainability problem in the civil aviation sector. It is functional to answer a question about whether stakeholders

are concerned with the issue of sustainability and what behavioural models they can apply to use their power and force a company to integrate sustainable changes into the existing business model.

The earlier discussion identified vital stakeholders operating in the civil aviation sector. The following stakeholders can be considered vital for the operations of the civil aviation sector: “manufacturers, passengers, freight, airport and aviation services, governments, and air transport sector employees” (Solaimani et al., 2013). We also identified additional categories of stakeholders: state authorities (UAE Ministry of Economy), a competent aviation regulator (the civil aviation sector Authority), airport companies, airline operators, and passengers. In addition to these categories of stakeholders, employees of the civil aviation sector companies should be regarded as one of the key parties engaged in the process of sustainability integration as well (Casey & Sieber, 2016). For each of these categories of stakeholders, it is crucial to identify their nature and motivations for influencing the changes in sustainability configurations of the civil aviation sector. This information will make it possible to define the stakeholders’ potential role in enhancing sustainability matrix project realization in the civil aviation sector.

The discussion of stakeholders' behaviour and attitudes to the performance of the civil aviation sector should start by identifying sustainability indicators for each stakeholder. The first category of stakeholders that should be considered in this context includes passengers, and it consists of subjects that serve as critical consumers of the civil

aviation sector services. Companies mainly generate profits from their passengers, and it is essential to satisfy their critical needs for a business to remain profitable. Buaphiban (2015) defined the role of the following critical criteria in the process of passengers' decision-making when it comes to the selection of an airline: attitude, subjective norms, perceived behavioural control, company's public reputation, service quality, price, safety, route availability and frequent flyer programs available.

Among the mentioned factors, the following can be considered related to the sustainable development of business: attitude, company's public reputation, service quality, price, and safety. Thaichon et al. (2016) established that the orientation of passengers' expectations could make them pay higher prices for the service quality that fulfils their needs. It was found that higher safety and quality of customer service during a flight can also affect passengers' preferences. As for the critical sustainability values that passengers target, the role of the following indicators was highlighted: reduction of noise and fuel consumption, environmental responsibility of a business, and effectiveness of waste management (Addepalli et al., 2017). Finally, Woon et al. (2015) identified the impact of the following factors on passengers' decisions about the purchase: the company's commitment, trust between passengers and the company, and perceived quality of service. Overall, the passenger behaviours assessment results demonstrate the significant impact of factors related to sustainable development on their choice of a civil aviation sector company.

The second important category of stakeholders that should be studied in the context of the stated question includes employees working in the civil aviation sector. Their power explains their significant role in the sector in civil aviation sector companies (Lorincova et al., 2019). The quality of employees' work and their motivation affect the quality of passengers' services and their safety, which are among the critical criteria for passengers in the civil aviation sector (Lorincová et al., 2019). From this perspective, a business needs to guarantee the satisfaction of its workers' key expectations and needs, motivate them, and contribute to their development as specialists (Lorincova et al., 2019). It is important to assess their needs and define sustainable development's role in guaranteeing high-quality personnel motivation.

A wide range of experts assesses the main motivational factors concerning the employees in the civil aviation sector. In particular, Chatzopoulou (2015) defined the leading role of the following factors: equal and fair treatment in the workplace, high compensation level, exciting nature of work, objective assessment of employees' progress, effective development of competencies, safety and security of the working environment. Additionally, Penni (2019) stressed the role of such factors as workplace promotion, a clear understanding of the company's mission and vision, work-life balance opportunities, and security of working conditions. Finally, Lorincova et al. (2019) demonstrated the significant role of "atmosphere in the workplace, basic salary, good work team, fair appraisal system, and supervisor's approach" (p.6). Overall, analysing the factors that generate value for employees in the civil aviation sector reveals that sustainable

development can be considered an important objective among workers since it can increase their motivation and satisfaction.

The importance of consideration of passengers' and employees' positions as stakeholders of the civil aviation sector is identified by the fact that their influence on the development of this sector is apparent and can be presented. Yet, the impact of these categories of stakeholders can be quite limited under specific circumstances. For example, in case a limited number of airline companies operate in the emirate, passengers will have to face a lack of opportunities for pressure on the providers of services (Lorincova et al., 2019). At the same time, limited employment opportunities will force employees to adapt to the existing conditions in the organization, removing possibilities for the promotion of sustainable development. In these conditions, one of the stakeholders that can put the most severe pressure on the civil aviation sector business about sustainable development is different governmental authorities (ICAO, 2015). State authorities as a stakeholder obtain direct mechanisms of regulatory influence on the performance of the civil aviation sector company. Even if the business can ignore customers' and employees' needs for a certain period, leading to the accumulation of sustainability risks, the requirements of the government cannot be bypassed due to the absence of alternatives that would allow it to maintain operations.

In the circumstances of the significant influence of government on the work and development of the civil aviation sector, it is important to define the nature and interests of this stakeholder from the position of sustainability of the civil aviation sector. Compared

to the earlier mentioned stakeholders, state authorities and regulatory organizations provide the most structured and detailed instructions for the civil aviation sector companies. Moreover, their range of interests in the sustainable development of the civil aviation sector is more comprehensive compared to most other engaged stakeholders. Their interests include the following aspects: security and safety of airline services, environmental risks mitigation strategy, economic sustainability concerns, and social impact of the civil aviation sector operations (ICAO, 2015). One of the most critical questions in the functions of the civil aviation sector for governments is the issue of operations safety (Yadav & Nikraz, 2014). Companies must comply with the clearly stated safety standards to receive a civil aviation sector operations license. Together with this, governments are interested in the operations of the civil aviation sector as a source of economic growth for the country (Bastola, 2017). From this perspective, state authorities can be considered as a subject that severely pressures the civil aviation sector from the position of sustainable development.

The final category of stakeholders that should be analyzed as severe influencers for the decision-making process in sustainable development for the civil aviation sector business includes airports and airline companies. They provide essential resources required for developing a business, which defines their specific role in the company's management. Consequently, the management of civil aviation sector organizations is necessary to orient on the satisfaction of the needs of airports and airline companies to improve brand reputation and remain capable of attracting new funds for future growth (Muthukrishnan, 2011). While the customer serves as the primary source of profits for the business, investors provide the required funds for its strategic expansion.

From the position of investors as potential providers of financial resources for the aviation sector, the following trends are related to the sustainable development of business: investors' interest in the environmental, social and governance (ESG) issues and socially responsible investing. The focus on the ESG issues includes monitoring and selecting projects that can have a significant positive impact on the environment and society. The trend regarding the growth of ESG investing can be seen in Figure 3 (Grim & Berkowitz, 2018). From 2012 to 2016, the total value of global ESG assets increased from US \$13.3 billion to US \$22.9 billion. Different models of sustainable investing were developed, including the following: sustainability-themed investing, social impact bonds, and green bonds (Grim & Berkowitz, 2018). These initiatives demonstrate the change in the perception of sustainability issues in the global community of investors. Despite the initial orientation solely on the economic aspects of specific projects, the modern trend is associated with a higher level of concern about the ESG aspects of the project.

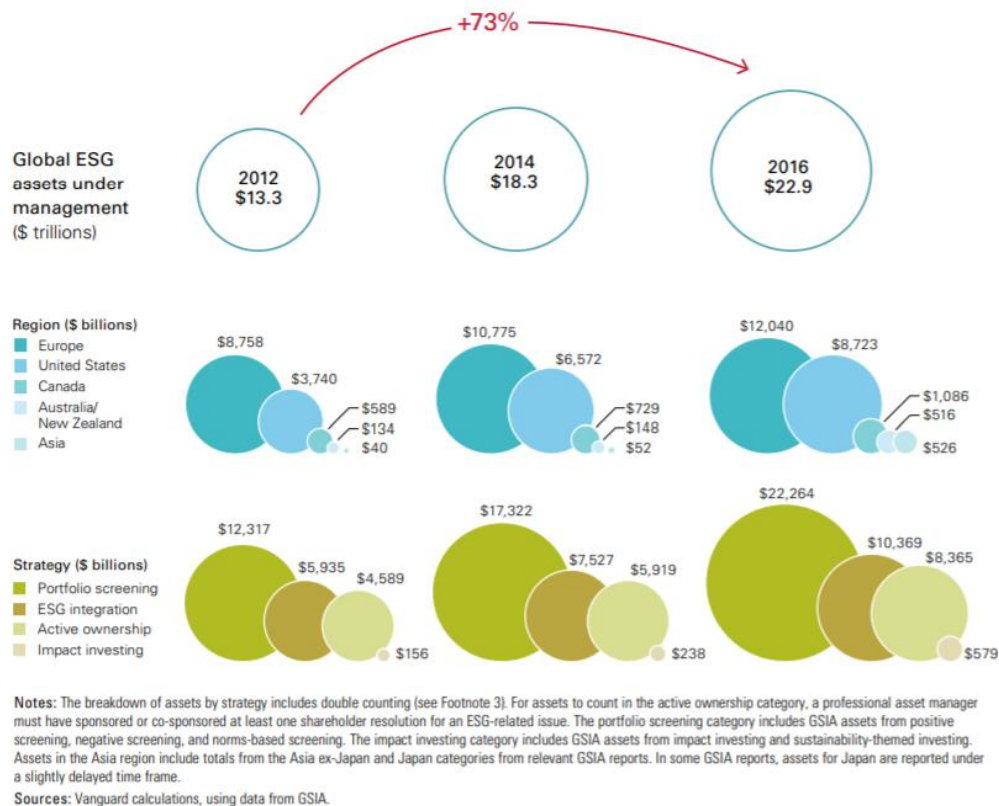


Figure 4: ESG Investing Trend

Source: Grim & Berkowitz, 2018

With the rising demand for sustainable investment projects, it is important to understand whether SRI activity can be considered a profitable decision for investors. The need to answer this question is based on the idea that the primary interest of investors in any project is related to the maximization of financial benefits (Eccles & Klimenko, 2019). In these conditions, the orientation of the SRI projects might not be attractive for investors if such a decision does not guarantee comparable profits. Wallis & Klein (2015) provide the analysis and comparison of the profitability of the SRI and conventional investing

activities. According to the results of the complex academic literature review, it was found that the SRI activity can be regarded as a valuable source of profits for a business. In addition, it generates reputational benefits gained from investing in the sustainable development of companies. Overall, investors should be viewed as an important source of motivation for civil aviation sector businesses to initiate sustainable development projects.

The results of the performed analysis of the critical categories of stakeholders in the civil aviation sector have revealed that each of the involved parties can be considered an essential source of encouragement for developing sustainability projects in the civil aviation sector. While each stakeholder might be oriented on the specific type of sustainability in business, their general impact can lead to the complex and balanced realization of the full range of sustainability objectives. It is important to assess their impact on different aspects of sustainable development to provide a deeper understanding of the stakeholders' potential role in the development of sustainability in the civil aviation sector.

2.9 Stakeholders' Engagement in the Development of Sustainability in the Civil Aviation Sector

The earlier discussion of the stakeholders' interests in the civil aviation sector sustainability has demonstrated their motivation for the sustainable development of business and their power in influencing the realization of the sustainability projects in this sector. From this perspective, it is important to provide a more detailed discussion of the stakeholders' impact on critical types of sustainability in the civil aviation sector (Jeffery, 2009). Based on the findings of the performed analysis, it should be possible to identify

actions required for more effective engagement of stakeholders in the sustainable development of business.

2.9.1 Role of Stakeholders in the Promotion of Social Sustainability

The final aspect of the sustainable development of the civil aviation sector that should be considered is social sustainability. Regarding the business, it is characterized as the ability of the organization to guarantee the sound quality of protection of rights and interests of different categories of stakeholders engaged in its operations. To determine the specific role of various stakeholders in social sustainability promotion, it is important to summarize the key indicators of social sustainability that groups of stakeholders apply. The prior study results in the chosen field of research demonstrate differences in the engaged stakeholders' perception of the social sustainability of the civil aviation sector. As regards passengers, the key indicators of social sustainability include quality of life, equal opportunities and protection of stakeholders' rights, cultural diversity, and corporate social responsibility (CSR) policies (Fontaine, 2013). Social sustainability also allows the passengers to have social awareness in terms of increasing opportunities in the aviation industry, increasing growth and development, and shaping attitudes and awareness among the passengers (Machnik-Słomka, 2017; Hutchins and Sutherland, 2008). For the civil aviation sector as one of the key stakeholders, the following indicators are the most important and valuable: equal opportunities, national noise level; community trust and security; social outcomes of performance; quality and protection of stakeholders' rights. From the position of airlines as the engaged stakeholders, it is necessary to mention the

role of the following indicators: job opportunities, safety and security of services; social outcomes; passenger satisfaction; flexibility, and cultural diversity (Dimitriou and Sartzetaki, 2020; Chodhry, 2018). Finally, the key social sustainability indicators for airports are as follows: job opportunities; safety and security of operations, social engagement and outcomes; health and safety; stakeholders' interests and rights protection (Skouloudis, Evangelinos, & Moraitis, 2012). A summary of the critical social sustainability indicators demonstrates the potential vector of stakeholders' cooperation in social sustainability promotion in the civil aviation sector companies.

Analyzing the stakeholder's roles in social sustainability development in the civil aviation sector should be based on applying a particular set of analytical instruments. The relevant study results highlight the specific role of the instrument of social network analysis (SNA) for collecting and analysing information about the key engaged stakeholders and their interests concerning the social sustainability development of modern organizations (Doloi & Almahmoud, 2012). The application of this instrument contributes to the realization of several important objectives, namely, the definition of major engaged stakeholders, analysis of connections between the engaged stakeholders, and the assessment of the interests of each involved party (Doloi, 2012). To discuss the role of each specific stakeholder in the process of social sustainability development in the civil aviation sector, it is important to distinguish the pressure caused by primary and secondary stakeholders. While primary stakeholders have resources to pressure the organisation strongly, secondary ones do not possess similar opportunities for influence (Awan et al., 2017). The key types of the impact caused by stakeholders in the process of social

sustainability development in modern companies include the following: “regulatory pressure, customer-specific requirement, consumer pressure, competitors, employees and investor pressure and NGOs pressure” (Awan et al., 2017). Taken together, the primary influence of stakeholders on the process of social sustainability promotion in the companies is related to the direct pressure on their decision-making process. Richards and Barry (2010) describe the importance of social awareness in maintaining social sustainability.

A more detailed analysis of the potential pressure caused by stakeholders regarding sustainable development can support the research in defining fundamental mechanisms applied in the course of social sustainability promotion in the civil aviation sector companies. In this context, Mani and Gunasekaran (2018) provided the model of stakeholder's influence on a business's social sustainability based on the following types of pressure: customer social pressure, sustainability culture requirements, regulatory compliance pressure and external stakeholders pressure (p.156). The power of customers explains the significant role of customer social pressure as a key generator of profits for a company (Timmis, 2015). As for sustainability culture, the orientation of the contractors and suppliers concerned with social sustainability can place the civil aviation sector organizations in conditions where they are forced to comply with their requirements. Finally, the regulatory pressure of state authorities is regarded as the most influential source of pressure for the development of social sustainability in modern organizations (Mani & Gunasekaran, 2018, p.158). While governmental regulations play a key role in social sustainability promotion, organizational commitment and professional body support inside the business are also crucial for establishing social sustainability (Kaur & Lodhia, 2016;

Kuo et al., 2016). It is also necessary to reach mutual agreement and cooperation between engaged stakeholders (Geiger, 2017). Otherwise, the process, in general, can face the risk of failure.

The discussion of the stakeholders' role in the process of social sustainability promotion in the civil aviation sector should also include a definition of critical requirements and challenges faced by the civil aviation sector companies in the process of the stakeholders' engagement in the promotion of social sustainability. First, the main aspects regarding stakeholders' interests in the process of social sustainability promotion should be summarized (Soma et al., 2018). For different types of organizations, significant aspects that stakeholders value when it comes to social sustainability include the following: “equal opportunities; education and training; governance; health and safety; employment; security; human rights; indigenous rights; labour practices; fair operating practices; cultural heritage; community involvement and development; consumer/product responsibility, technology development” (Weingaertner & Moberg, 2016; Ilkhanizadeh and Karatepe, 2017). In the context of stakeholders' engagement for social sustainability development, organizations face a list of challenges. They are as follows: “lack of the unified scheme of stakeholders engagement, conflicts of interests, lack of capacities, a too high number of different stakeholders, later stage of stakeholders engagement, stakeholders fatigue and cynicism, risks for government and barriers in direct dialogue and engagement with some stakeholders” (Filho & Brandli, 2016). An effective mechanism for the prevention of the stated issues is required to guarantee the successful engagement of stakeholders in the social sustainability development process.

The effective engagement of the stakeholders in the process of social sustainability development in the civil aviation sector requires the application of specific methods and managerial practices. From this perspective, stakeholders can impact a change in the managerial models utilized in the civil aviation sector organizations and the promotion of social sustainability (Air France, 2014). Ferro-Soto et al. (2018) highlighted the importance of the transformations in the organizational culture as the key elements of influential stakeholders' engagement. The second significant element of the beneficial engagement of stakeholders for social sustainability promotion includes the development of a practical format of social sustainability reporting (Amaeshi & Crane, 2006). The leading indicators aimed at the assessment of its effects include the following: "profile, strategy & policy, governance & management, results, reporting policy, the relevance of reporting, clarity of reporting, reliability of reporting, stakeholders' involvement and contextual contingency" (PWC, 2011). All these parameters demonstrate the stakeholders' values concerning sustainability reporting procedures (Herrera & Heras-Rosas, 2020). It is possible to say that the effective engagement of stakeholders can contribute to the improvement of the earlier stated aspects of sustainability reporting in civil aviation sector organizations (Hannigan et al., 2015).

To summarize the stakeholders' role in promoting social sustainability in the civil aviation sector, it is important to highlight the specific indicators that present the highest interest for the stakeholders in the process of social sustainability level assessment in the particular organizations. In that respect, the Sydney Airport outlined the role of the following social sustainability indicators: "impacts of existing development and

operations; plans for future development; proposal to change aviation services; ground transport access issues; access issues for passengers; planning and policy changes in airports; changes of airport facilities; effectiveness of complaint-handling procedures; and strategy of board informing on the existing issues” (SYD, 2020). In addition to this list of indicators, Chang et al. (2015) established the impact of the following indicators of social sustainability applied in the civil aviation sector: “environment and social reporting, labour practice indicators, human capital development, talent attraction and retention, corporate citizenship and philanthropy, stakeholders’ engagement and product responsibility” (p.7768). In conclusion, stakeholders are oriented on a wide range of social sustainability indicators, contributing to their effective integration into operations of the civil aviation sector.

The discussion of the stakeholders’ role in promoting social sustainability in the civil aviation sector points to the importance of stakeholders’ effective engagement and various domains of the civil aviation sector performance that they can impact. While the definition of the critical indicators of social sustainability and stakeholders’ role in their realization has contributed to a better understanding of the significance of stakeholders’ engagement, it is necessary to understand the specific models of stakeholders’ meetings utilized in the civil aviation sector to guarantee its high effectiveness for social sustainability development. The analysis of the role of the reporting process in this context has been necessary to define one of the critical mechanisms of cooperation between stakeholders and the company. Nevertheless, a better understanding of the stakeholders’

position on the optimal means of collaboration for promoting social sustainability is required.

2.9.2 *Role of Stakeholders in the Promotion of Economic Sustainability*

Economic sustainability is one of the critical interests of the majority of the engaged stakeholders. This is explained by the fact that the improvement of the economic sustainability of a company leads to direct benefits for the main stakeholders, namely, reduction of prices for passengers, improvement of compensation level for employees, increase of returns for investors and tax payments for the government. Yet, it is difficult to reach an objective understanding of the stakeholders' role in the development of economic sustainability in competitive and efficient business activity because for a company to be sustainable, it has to engage in electricity usage and waste disposal effectiveness, which in turn generates a financial benefit for the company. Companies are selected to minimize pollution by the financial rewards they get. The social desirability of a corporation may be improved by all of these dimensions of societal functionality and social progress. To be successful, a firm must concentrate on societal problems, such as offering equitable salaries, flexible work schedules for women, and encouraging participation in social events by its workers. Economic expenditure is shown to have an implicit influence on sustainability, which means that economic improvement in sustainable development will need a repayment duration in the form of a return on investment. Reduce, recycle, compost and reuse the material to improve the company's waste collection effectiveness and financial payback on your resources.

Kumar et al. (2016) demonstrated that, currently, the stakeholders are mainly concerned with environmental sustainability development, and their role in promoting economic and social sustainability is considered weaker. In this context, it is essential to discuss the specific mechanisms that the civil aviation sector stakeholders can apply to influence the processes of economic sustainability development in companies.

The first aspect that should be discussed concerning the study is that the active engagement of stakeholders is believed to be one of the significant factors of sustainable development for organizations. Without their engagement, the business might find it challenging to define the specific vector of sustainable development that will satisfy the needs of all actors inside and outside its operations (Geissdoerfer et al., 2018; Baltaci et al., 2015). Before the discussion of the impact on economic sustainability, it is sensible to determine the following categories of stakeholders: regulatory stakeholders, organizational stakeholders, community stakeholders, and media (Gao & Zhang, 2006, p.725). The nature of a specific group of stakeholders determines their influence on the decision-making process in the organization (Toman & Pezzey, 2002). Additionally, it is important to remember that the cooperation between the company and its stakeholders is always a consensus development process (Gao & Zhang, 2006, p.725). Due to the existing differences in the stakeholders' interests, the organisation's management has to orient on the solutions that will result in a balanced and satisfy all parties. This is the objective basis of economic sustainability development.

The study of the specific steps required for the successful engagement of the stakeholders in the process of corporate sustainability development has allowed the researchers to identify the best practices required to guarantee the effective inclusion of stakeholders in the decision-making process (Rotondo et al., 2019; Dharmawan, 2012). Among such steps, the following should be mentioned: to provide stakeholders with complete information about business and other stakeholders; to guarantee stakeholders' trust in the social and ethical accounting; to involve the stakeholders in the process of definition of terms of engagement; to include public disclosure and allow stakeholders to express their positions without restriction (Gao & Zhang, 2006, p.726). As can be seen, the stakeholders' role should be based on principles of direct communications and negotiations concerning all aspects of sustainable development, including business economic conditions.

The stakeholders' impact on the economic sustainability of a business can also be explained by the fact that their behaviour and attitude to the company's actions in the sustainability sphere can influence the management's readiness for changes. This question was addressed earlier, though no detailed discussion of the specific risks that stakeholders can generate for the economic sustainability of an organization was provided. In this context, the existing risks should be considered from the position of the company's supply chain management (SCM) model. Rebs et al. (2017) identified the following categories of risks posed by stakeholders that can impact the sustainable development of business: supply, demand, product, and information risks (p.221). The supply risk is based on the supplier's failure to comply with the initially stated principles of cooperation. The demand

risks are related to the company's inability to sell the planned volume of products or services in the market. The product risks are premised on the inappropriate quality of the final product because of stakeholders' influence. Finally, information risk refers to the issue of information asymmetry in the cooperation of stakeholders. As can be seen from this analysis, stakeholders can play a severe role in the process of economic sustainability development.

Effective engagement of stakeholders can also be considered a source of competitive advantages for a business, which is the basis of its economic sustainability. The main benefits of influential stakeholders' involvement in economic sustainability include regular dialogue and continual iteration with stakeholders and better positioning of the company regarding anticipation and reaction to existing economic challenges (Whelan & Fink, 2016). The absence of practical cooperation between stakeholders and a company can lead to conflicts and reduce its operations' economic effectiveness. In addition, practical collaboration with stakeholders can affect the organisation's barriers in everyday operations (Whelan & Fink, 2016). Modern customers expect to receive the highest quality a product and services. The company's interest is in providing sustainable results and complete information for clients to affect their preferences in favour of its offering (Whelan & Fink, 2016). Businesses can increase their prices based on the customers' readiness to pay more for better quality using sustainable development mechanisms. Furthermore, good cooperation with employees can increase their productivity and performance outcomes for the company in general.

The problem of stakeholders' engagement for the aims of economic sustainability development should also be addressed from the position of the assessment of their role in the process of sustainability-oriented innovations (SOI) realization. According to Ghassim (2018), two types of stakeholder engagement for the mentioned purposes were defined: transactional and relational (p.55). Discussing these forms of stakeholder engagement is important to establish the potential role they can play in the sustainable development of a business. In this context, transactional interaction between an organization and its stakeholders supposes the company can perform sustainable development based on gaining knowledge about the stakeholder's expectations without requiring direct participation in decision-making (Ghassim, 2018). Compared to this, the relational interaction form implies the active engagement of stakeholders in all stages of the sustainable development process. Such direct cooperation with stakeholders allows businesses to gain more relevant and reliable information about their preferences without delays and misunderstandings. Also, knowledge sharing can be crucial in maintaining economic sustainability (Natti & Still, 2007; Warkentin et al., 2001; Yuan et al., 2016). Knowledge sharing can occur through the effective use of technologies like data analytics, cloud technologies, and many others (Wixom et al., 2008; Hausladen & Schosser, 2020; Heilig and Vob, 2017).

The final aspect that should be mentioned in assessing the stakeholders' potential role in economic sustainability development is the application of social auditing mechanisms for collecting reliable data from stakeholders. From this perspective, relevant studies highlighted the positive role of practical auditing and reporting to the stakeholders in the sustainable development of a business (Gao & Zhang, 2006; Holland et al., 2020).

The social auditing practice's objective is to establish an effective dialogue between stakeholders and management and among stakeholders. The realization of this format of cooperation with stakeholders requires significant changes in the company's corporate culture, which include the following: "shift from objects to relationships; shift from parts to the whole; shift from domination to partnership; shift from structures to processes; shift from individualism to integration and from growth to sustainability" (Gao & Zhang, 2006, pp.728-729). As can be seen from the description of the required changes, the stakeholders' role in the process of economic sustainability development is related to the radical transformation of the form of cooperation between them and the organization's management.

With the discussion of the theoretical aspects of economic sustainability promotion by stakeholders, it is important to consider specific examples when the engagement of stakeholders led to the effective development of the financial sustainability of the business. While the study's key objective includes the civil aviation sector, the number of reliable and relevant research on sustainability in this sector is quite limited. That is why it is necessary to investigate the best examples in other industries and economic sectors to form the full image of perspectives of stakeholders' engagement (Alshehhi, 2018). The performance of the following companies can be regarded as the source of information about examples of successful stakeholders' engagement for the promotion of the economic sustainability of a business: Intel, Adidas, and Nokia (Lorne & Dilling, 2012). In the case of Intel, the adequate support of non-governmental organizations (NGOs) using business resources led to increased business operations transparency in the developing world,

reducing operations costs for Intel and other international corporations (Lorne & Dilling, 2012). The cooperation between Intel and the NGOs resulted in mutual benefits and increased the company's economic sustainability. Like this, Nokia and Adidas offered specific benefits to their communities, which increased their economic sustainability (Lorne & Dilling, 2012). As regards Nokia, the management of the company developed special programs for communities in developing states to receive mobile phones for a lower price. Because of this initiative, demand for the company's services and products in the developing world rose, which was a factor in the economic sustainability of the business.

Finally, the role of stakeholders in promoting economic sustainability in the civil aviation sector should be discussed. An example is an influence of the African Development Bank Group (ADBG) on the sustainable development of the civil aviation sector. The objective of the ADBG performance was related to the formulation of a specific framework for the growth of the civil aviation sector in the African states and the financial support of initiatives oriented toward the realization of this program. Among the key elements of the framework, the following should be mentioned: liberalization of the African civil aviation sector market, an increase in private sector participation, improvement of safety and security of the civil aviation sector services, and enhancement of operational efficiency and sustainability of the civil aviation sector in Africa (ADBG, 2019, p.26). This example shows how operational and regulatory stakeholders of the civil aviation sector can unite their efforts to support the sector's economic sustainability. The influence of the ADBG on the operations of the civil aviation sector was related to the practical cooperation of the banking business and governmental organizations. This case

also supports practical collaboration between stakeholders in economic sustainability promotion in the civil aviation sector. Cooperation between the banking sector and African governments and their ability to identify domains of mutual interest regarding the sustainability of the civil aviation sector allowed them to develop a reliable framework for its support.

Discussing different aspects of stakeholders' engagement for economic sustainability improvement has demonstrated that practical cooperation between stakeholders and the companies of the civil aviation sector is required. It is essential to distinguish between the influence of regulatory, operational, community, and media stakeholders in economic sustainability development. Besides, several gaps in knowledge about the role of stakeholders in the civil aviation sector's economic sustainability have been identified. First, defining factors that can lead to poor quality of stakeholders' engagement in the civil aviation sector aimed at economic sustainability development is necessary. Second, it is functional to address the issue of the effectiveness of the existing practices of social accounting in the civil aviation sector. Finally, there is a need to assess the effectiveness of stakeholders' cooperation in promoting economic sustainability in the civil aviation sector.

2.9.3 Role of Stakeholders in the Promotion of Environmental Sustainability

Environmental sustainability is the second important form of sustainability that should be considered in the civil aviation sector. The results of a prior study have contributed to defining key indicators of environmental sustainability for the major

categories of stakeholders. For passengers, the following parameters are vital: appropriate resource management, environmental protection, clean energy application, and relocation of resources. As for the civil aviation sector, the leading ecological sustainability indicators include emissions and noise reduction, climate change and footprint control, air quality, and compliance with environmental standards. As regards airports and airlines, the following values have been established to be relevant: environment-friendly technologies, waste reduction, air quality and climate change, waste and noise reduction, rational resources application, and compliance with regulatory requirements (Upham & Mills, 2005). From this perspective, it is essential to understand the impact of stakeholders on the development of the environmental sustainability of modern civil aviation sector organizations.

Various other aspects are linked to maintaining environmental sustainability in the aviation sector, like maintaining carbon emissions and producing sustainable aviation fuels concerning sustainable aviation fuels, Mussatto et al. (2022) mention that compared to traditional kerosene, fuels known as sustainable aviation fuels are capable of producing fewer carbon emissions and can be generated in a more environmentally friendly manner. Manufacturing and deploying such powers on a broader scale constitute a crucial step toward a better sustainable aviation sector today. The aviation sector has committed to considerably decreasing its climate impact by the year 2050. In addition, Barke et al. (2022) mention that using sustainable aviation fuels would be favourable, especially in reducing hazardous emissions that negatively impact the environment and individuals. However, using fossil kerosene may also be beneficial over using sustainable aviation fuels due to its

lower costs. Hence, the companies that are under a cost constraint, it is difficult for them to focus on the sustainability aspect. In addition, Abrantes, Ferreira, Silva, and Costa (2021) mention that the cumulative impact of innovations with sustainable aviation fuels is deemed acceptable if companies achieve the targets stated by IATA, for instance, reducing carbon emissions by 50 per cent and carbon-neutral growth from 2020. The evaluation findings suggest that the targets cannot be realized merely with the simultaneous effect of forthcoming aeroplane technology and the usage of alternative fuels. Carbon-neutral development is only realized when the cumulative impact of technology is evaluated with the situation that the quantity of sustainable aviation fuels produced is larger (Abrantes et al., 2021). Concerning reduced carbon emissions, Liu, Hang, Wang, and Zhou (2020) have also outlined that carbon emissions have increased significantly as a negative impact on the aviation sector, and it is essential to reduce them.

The analysis of the stakeholders' role in the promotion of environmental sustainability in the civil aviation sector should be based on the application of the stakeholder theory. This methodology contributes to the definition of the structure of stakeholders that impacts the performance of a specific organization and the mechanisms of such influence (Hörisch et al., 2014). The analysis of the problem of stakeholders' effect on the environmental sustainability of a business performed by Lindblom & Ohlsson (2011) demonstrated exciting findings. When it comes to ecological sustainability promotion, the leading role is played by government agencies, which provide environmental regulations that are obligatory for a company to follow (Van der Walddt, 2016). The employees' role in promoting environmental sustainability has been related to

their ability to offer new solutions for environment-related issues in the organization (Lindblom & Ohlsson, 2011). The final category of influential stakeholders from the position of environmental sustainability promotion includes customers (Lindblom & Ohlsson, 2011). At the same time, it has been established that suppliers possess limited opportunities to pressure a business in this aspect of its development (Lindblom & Ohlsson, 2011). In the context of real-life examples, the specific business case studied by Penzenstadler et al. (2013) identified the leading role of state authorities and NGOs in promoting environmental sustainability. So, it is possible to offer a specific pressure distribution model in the stakeholders' structure.

To define the role of the engaged stakeholders in promoting environmental sustainability in the civil aviation sector, it is essential to summarize findings for the organization of environmental sustainability management in modern companies performed by stakeholders. Smaliukienė (2007) identified the conceptual framework of environmental sustainability promotion in modern organizations (Figure 4). According to this model, the stakeholders influence the environmental sustainability promotion in businesses at different stages, from identifying a company's responsibility to specific performance (Abdullaha et al., 2016). The instrument of environmental sustainability responsibilities establishment is mainly related to developing the corporate social responsibility (CSR) framework (Camilleri, 2017). Such a complex approach guarantees the practical realization of environmental sustainability initiatives.

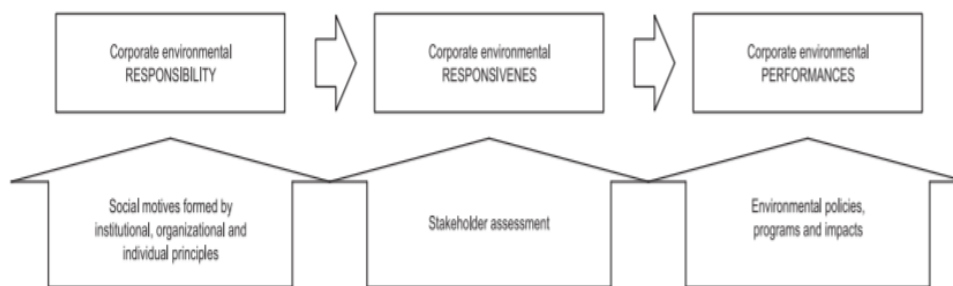


Figure 5: Conceptual Framework of Environmental Sustainability Promotion

Source: Smaliukienė, 2007

Together with the earlier presented model of environmental sustainability promotion, stakeholders can apply a list of additional solutions to pressure the organization to change its sustainability policy effectively. The first form of the coordinated performance of stakeholders that can impact the company is the multi-stakeholder initiative (MIS) format (Bakker et al., 2019). It supposes the integration and cooperation of different stakeholder categories mentioned earlier. In addition to the MIS format, Collaborative Environmental Management (CEM) initiative can be implemented. While the MIS format implies the coordination of stakeholders' pressure on business, the CEM format is applied to establish a strategic management process that will serve as a basis for the productive partnership between key stakeholders and the management of the organization (Štimac et al., 2017). The main pillars of the CEM format include the following: "shared understanding; shared information; consultation and joint implementation" (Štimac et al., 2017, 293). As can be seen, the effective engagement of stakeholders can create a foundation for a new quality of environmental sustainability management in the civil aviation sector.

In addition to analysing the specific mechanisms of environmental sustainability promotion, it is important to address the key challenges that stakeholders can face in the process. From the position of environmental sustainability, the main issues encountered are climate change conflict (Chen, 2010) and the conflict between a business strategy and the environment (Welford, 2018). These challenges are mainly explained by the fact that any type of stakeholders' environment-oriented initiative faces specific economic losses for the organization that undertakes obligations to accept this initiative (Smaliukiene, 2007). Due to the company's primary interest in maximising the financial benefits, the integration of environmental sustainability practices in its performance can become a severe problem for stakeholders (Polansky et al., 2019; Stimac et al., 2017). From this perspective, it is functional to discuss methods that can be utilized to overcome this issue in the civil aviation sector of Dubai.

The discussion of the stakeholders' role in promoting environmental sustainability should be supported by analysing the business cases of modern organizations operating in the civil aviation sector. For this purpose, the sustainability reports of the leading global business players have been analyzed, and the following facts have been established. The case of Air services (2013) demonstrated the direct orientation on complex cooperation with stakeholders as one of the main priorities in the process of environmental sustainability promotion. Moreover, informing stakeholders effectively was one of the main elements of their engagement (Air services, 2013). Similarly, Omega considered adequate knowledge sharing with stakeholders as one of the main elements of environmental sustainability development (Gardner, 2007).

Furthermore, the Etihad Aviation Group mainly focused on the reliable sustainability reporting strategy as a stakeholder engagement (Etihad Aviation Group, 2017). Finally, the most diversified model of stakeholders' engagement for environmental sustainability promotion was demonstrated at the Heathrow (2018) airport. It included developing various forms of cooperation with stakeholders aimed at environmental sustainability promotion: colleague diversity networks, cross-functional governance groups, local community forums, team Heathrow groups, membership in trade, and sustainability organizations (Heathrow, 2018). In conclusion, these findings demonstrate the stakeholders' significant role in environmental sustainability promotion and different means of realising the given objective.

2.10 Theoretical Background

The theoretical framework elucidates the insights relating to concepts and theories that are essential to the study. Also, it offers a framework for connecting research to broader fields of knowledge. This study context involves identifying the role of sustainability in Dubai civil aviation sector operations and assessing optimal stakeholder engagement to enhance sustainable development. By identifying the sustainability forms and dimensions, including ethical, social, and environmental aspects, the theoretical background attempts to prioritize concepts of theories to the sustainability of civil aviation in Dubai. Sustainability theories and models constitute natural and human ecological phenomena and can describe, analyze, and prescribe practical and scientific survival approaches (Starik & Kanashiro, 2013).

For instance, various models and tools are about maintaining sustainability in companies. Some of the tools are life-cycle assessment (Jia et al., 2019), environmental performance index (Zuo, Hua, Dong, & Hao, 2017), strategic environmental assessment (White & Noble, 2012), cost-benefit analysis (Long & Ji, 2019), and sustainability assessment model (Adabre & Chan, 2020) among various others. For example, the objective of the life-cycle assessment is only related to environmental sustainability as a focus, and the scale measurement is for a product. However, the environmental performance index and strategic environmental assessment only have an objective that focuses on the environmental sustainability aspect. Cost-benefit analysis and sustainability assessment model are related to all aspects of sustainability, such as environmental, economic, and social sustainability, and the scale measurement is for a project.

Therefore, the theoretical background provides profound theories to illustrate and understand variables or phenomena under study. The sustainability theory and stakeholder theory are the primary theories that adequately explain the concept of sustainability and the role of stakeholders. Besides, such theories try to integrate social responses to cultural, economic, and environmental issues while sustaining financial and natural capital, ecological integrity, biological diversity, and human dignity.

2.10.1 The Sustainability Theory

The theory of sustainability revolves around societal efficient and equitable resource distribution; sustainability is associated with the economic activities and operations within a finite ecosystem. Significantly, sustainability relates to the corporate

and financial environment (Alameeri et al., 2017). Regarding sustainability, the corporate sustainability theory has been utilized in the corporate context to explain the sustainable development concept in businesses. Corporate sustainability theory focuses on the benefits of meeting the needs of stakeholders while balancing the environmental, economic, and social dimensions of organizational performance (Fischer, Brettel & Mauer, 2018). This theory also functions through a concept called the Triple Bottom Line, developed by Elkington, constituting the three dimensions (Chang et al., 2017). Through the triple bottom lines, corporates can enhance their efforts toward sustainable development with a management framework that integrates social, environmental, and financial dimensions. Also, corporates enhance their competitive advantage by concentrating on the triple bottom line approach dimensions. Another model integrated into the theory of sustainability is the business model. The business model elucidates how corporates acquire their competitive advantage through their services or products (Chang et al., 2017). Notably, sustainable business models usually incorporate the social, environmental, and financial dimensions while considering the interests of various stakeholders. Firms can embed sustainability into business processes and purposes through a sustainable business model.

The sustainability theory can also be explained through various types of sustainable development, including weak sustainability, strong sustainability, and absurd strong sustainability. Weak sustainability entails a human-based view that manufactured capital can replace natural capital (Shi et al., 2019; Biely, Maes & Van Passel, 2018). Concerning neoclassical welfare economics, humans claim that the total amount of natural and manufactured capital is an essential aspect. Therefore, as long as capital increases

during development, sustainability is still achieved. On the other hand, strong sustainability refers to a nature-based view where natural resources play a vital role in manufacturing and consumption (Shi et al., 2019). As such, this concept demonstrates that it is impossible to manufacture capital without natural capital input. Hence, the development process should consider capital structure rationality. Also, economic development should not exceed the natural limit.

Further, absurdly strong sustainability acknowledges that manufactured capital cannot replace natural capital, so utilization and exploitation of natural resources should be avoided and eliminated (Shi et al., 2019). Notably, this concept acclaims that people should develop without altering nature's status quo as all species in the ecosystem are equal. Sustainability advocates for cooperative governance, and sustainable development involves social coordination (Shi et al., 2019). Governance is the primary factor that promotes sustainability.

2.10.2 Sustainability Theory and Civil Aviation Sustainability

The sustainability theory can be integrated into understanding sustainable development in civil aviation. Based on the sustainability dimensions, including the environmental, social, and economic ones, the civil aviation sector can strike a balance between business and environmental, social, and economic sustainability. Besides, environmental sustainability concentrates on maintaining the natural capital; hence, the civil aviation sector can ensure sustainability by balancing non-renewable and renewable resources. According to Alameeri et al. (2017), the increased volume of civil sector growth,

such as passenger traffic and cargo transport, has increased stakeholder concern over their influence on the environment. Airports and airline transport affect the environment by emitting greenhouse gases into the atmosphere as they operate at high altitudes, leading to climate change (Leamon et al., 2019). Also, noise from planes and other machines causes pollution, resulting in mental problems. As depicted in the sustainability theory, social sustainability involves the sector's ability to deal with issues like poverty alleviation. Civil aviation sector growth has brought forth multiple social impacts, including passenger growth. Remaining the social dimension may involve coping with mishandled luggage, delayed flights, and customer dissatisfaction. Further, civil aviation's economic sustainability consists of a production system that satisfies present consumption needs without affecting future consumption. Sustainability theory can be utilized to understand how to enhance economic growth while sustainably considering prospective consumers, such as ensuring the quality of service in airports and social responsibilities fulfilment (Wan et al., 2020).

2.10.3 The Stakeholders Theory

The stakeholder theory is a crucial perspective in theorizing the corporate role. The theory was introduced in the last quarter of the twentieth century by freeman. Freeman authored a book called strategic management-a stakeholder approach (Chang et al., 2017). In his argument, freeman posited that corporates should understand the association with traditional individuals and groups, including customers, employees, and supplies, as well as non-traditional ones, including environmentalists, government, and special interest

groups, to enhance their corporate management effectively (Chang et al., 2017). Besides, these stakeholders can impact firms' goals and objectives. According to the theory, there are two distinct stakeholders, including the primary stakeholders and secondary stakeholders. The primary stakeholders usually have a more direct impact or are affected by the organization than the secondary ones (Chang et al., 2017). Therefore, a stakeholder entails a person or group impacted by the attainment of firms' objectives and purpose or performance (Miles, 2017). Initially, stakeholder theory concentrated mainly on social stakeholders; however, the theory has currently incorporated the non-social stakeholder to deal with environmental matters.

Moreover, the stakeholder theory is based on the stakeholder approach. The basic concept of a stakeholder approach is that corporates or businesses are actors in the social environment and hence should deal with stakeholder demands and pressures to attain their goals (Chang et al., 2017). Nonetheless, the theory includes the shareholder approach that requires corporations to maximize profits. Therefore, corporates must ensure survival in the long run while considering the several stakeholders' needs. The corporates' survival is affected by shareholders and other stakeholders, including governments, workers, the general public, and customers. The theory classifies stakeholders into various categorizations based on the definitional framework. Claimant stakeholders are required to claim on the corporate business. The influencer needs a capacity to impact the corporate business, while combinatory needs both business claim and influential capacity in the corporate (Miles, 2017). According to Burga and Rezanian (2016), stakeholders have a legitimacy element that indicates their claim on the corporate.

The stakeholder theory develops an effective, practical, efficient, and ethical manner of managing corporates in a widely comprehensive and complicated environment (Harrison, Freeman & Abreu, 2015). The theory is practical because corporates must manage their stakeholders while treating them well, enabling them to reciprocate with positive perceptions, behaviours, and attitudes towards the corporate, which enhances efficiency (Harrison, Freeman & Abreu, 2015). Such perspectives include offering better financial terms, sharing crucial information, purchasing products and services, purchasing more stock, and enduring during challenging periods.

2.10.4 Stakeholder Theory and Civil Aviation Sustainability

Stakeholders and sustainability are linked to the interested individuals or groups and have rights and claims that business activities can affect or violate. In the civil aviation sector, stakeholders usually have varying expectations regarding sustainability (Alameeri et al., 2017). Effectively dealing with sustainability issues must be integral to civil aviation's corporate responsibility. As such, it enhances corporate performance and goal attainment. The stakeholder theory performs a framework to understand the ways and mechanisms of ensuring sustainability while taking care of stakeholders' needs. Karaman, Kilic, and Uyar (2018) demonstrated that stakeholder theory enables corporates to utilize their business disclosure when responding to influential stakeholders' informational needs. Such primary stakeholders in the civil aviation sector include the equipment and airline manufacturers, civil aviation sector members and employees, airports, customers, and the government. Therefore, such a sector should ensure the well-being of these stakeholders.

Engaging the stakeholders by the sector's management is vital for achieving corporate success. Significantly, stakeholders impact the sustainability process, resulting in the development of public and cultural norms that the industry abides by. The stakeholder theory offers a framework for understanding different stakeholders and their interests and needs.

2.10.5 Stakeholder Salience Theory

Mitchell, Agle, and Wood's (1997) theory of stakeholder recognition and salience has been among the most outstanding achievements in advancing stakeholder research. Mitchell et al. (1997) addressed how administrators recognize and rank the company's stakeholders in their paper. After analyzing a large amount of data and disputing multiple interpretations about what it implies to be stakeholders, they determined that stakeholders might well be distinguished by their presence of three characteristics: power, legitimacy, and urgency. In addition, they argued that such characteristics provide the basis for management prioritizing stakeholder concerns. Their hypothesis of stakeholder salience is defined as the extent to which administrators give precedence to conflicting stakeholder assertions (Mitchell et al., 1997). The authors further claimed that administrators would view stakeholders as more salient if they acquired any mixture of the three traits. Other scholars have provided empirical evidence for the notion (Eesley & Lenox, 2006). Administrators continually weigh the stakeholders' expectations versus the demands of other stakeholders, particularly investors (Eesley & Lenox, 2006). This needs an evaluation of the statement's legitimacy and the impact satisfying the request will have on stakeholder profits. For executives with constrained capacity, correctly identifying the company's

stakeholder sequence and precisely emphasizing stakeholder assertions are essential steps for the effective management of companies, the consequences of which have been felt by stakeholders.

Furthermore, such stakeholders get seriously influenced by the company's activities (Jawahar & McLaughlin, 2018). Research on salience has the opportunity to profoundly add to the prescriptive knowledge of how businesses should effectively manage numerous stakeholder interactions (Dunfee, 2008). This study is compatible with Mitchell et al. (1997) objective to create a thorough categorization of stakeholders depending on the ethical premise that these characteristics characterize the domain of stakeholders and such entities toward whom administrators must pay consideration. Mitchell et al. (1997) admitted that companies unavoidably established broad generalizations that must be reviewed and evaluated to expand the theoretical basis and increase its utilization. Despite the application's broad acceptability, attempts to extend it further or examine its underlying assumptions have been limited (Magness, 2008). In addition, these subsequent changes are seldom acknowledged and included, resulting in academics that refer to the stakeholder salience notion, often only citing the initial conception (Enroth, 2007).

The sustainability of a business is contingent upon the sustainable development of its stakeholder partnerships: an organization must recognize and interact not only major shareholders, workers, and customers but also vendors, governmental entities, the regional (or national, depending on the size of the business), and broader society, among others (Perrini & Tencati, 2006). The sustainability of stakeholders' connections could be the driving concept for business decisions and the core of a more complete company structure

currently and in the foreseeable future. The essential link in their idea would be that the number of stakeholder qualities increased stakeholder prominence (Perrini & Tencati, 2006).

They proposed and validated a framework of stakeholder salience wherein management beliefs and stakeholders' qualities impact management views of stakeholder salience (Agle, Mitchell, & Sonnenfeld, 1999). Administrators play a crucial part in the idea since stakeholder salience arises in their thinking. In addition, Pfeffer and Salancik (2003) found that management beliefs and distinctions depending on the uniqueness and innovation in the current setting considerably impacted stakeholder prominence. These authors contend that inevitable dominance, distinction, and unexpectedness influence organizational preconceptions of the stakeholder characteristics of power, legitimacy, and urgency; thus, they seek to describe how interested parties' qualities incorporate with management thoughts and behaviours to generate stakeholder salience (Mitchell, Agle, Chrisman, & Spence, 2011). In reality, the dynamics of stakeholder salience estimates and management reactions to the demands of salient users are expected to diverge in significant respects. While considering options that may result in alterations to the underlying framework, managers in such organizations examine a series of ethical considerations. For these reasons, we emphasise stakeholders in the civil aviation business to determine if the style of controlling stakeholder interactions is effective.

2.10.6 Stakeholder Salience Theory and Civil Aviation Sector

The topic impacts the idea of stakeholder salience at hand and the component of duration. Therefore organizations in the aviation sector should address monitoring

developments through time. Mitchell, Agle, and Wood (1997) explain this by asserting that executives should never neglect that stakeholders differ in meaningfulness, salience, and relative importance, needing differing levels and kinds of awareness based on their contributed ownership of power, legitimacy, and urgency. Additionally, the relative importance of the three characteristics and their overall salience can vary significantly from one issue to another and over time. The present research emphasizes stakeholder importance concerning particular sustainable challenges, including stakeholders' problems with the aviation industry's environmental, economic, and social impacts.

Consequently, key stakeholders will be assessed based on the degree to which executives view their demands to be potent, valid, and time-sensitive concerning this issue (Mitchell et al., 2011). Also, one of the most critical aspects of the stakeholders in civil aviation companies is how the company's growth influences its performance. This viewpoint contends that the numerous stakeholders' positions and behaviours are crucial to achieving the organization's operational goals. However, this research will include the changing composition of stakeholder salience by investigating how justifying activities for aviation stakeholders such as passengers, airports, the civil aviation authority, and airlines may have altered over time owing to shifts in stakeholder salience.

2.11 The Study Framework

The study seeks to determine the role of sustainability in the civil aviation sector operations in Dubai by examining stakeholders' role in sustainable development and specific means of stakeholder engagement. The dimensions and forms of sustainability

identified in the paper include the economic, environmental, and social sustainability indicators. Notably, as the civil aviation industry develops, different forms of sustainability are linked to variations in the specifics of the influence on the involved stakeholders and changes in how stakeholders are engaged to improve a given state of sustainability. Here, the study will determine how each sustainability indicator impacts the stakeholders' engagement, influencing sustainability in the aviation sector.

2.12 Chapter Summary

The current chapter discussed the development of the civil aviation sector nationally in the UAE and internationally. Furthermore, it focused on the concept of sustainability and its importance in the aviation sector. The chapter also outlined the role of stakeholders in maintaining sustainability in the aviation sector. Three primary sustainability indicators were discussed such as environmental sustainability, economic sustainability, and social sustainability. Along with this discussion, the role of stakeholders in promoting these sustainability indicators was also discussed. The following chapter is a research methodology, which outlines the method adopted to carry out the current research along with the discussion of the research method, data collection, and analysis.

3 Research Methodology

3.1 Research Philosophy

Research philosophy is a set of beliefs and beliefs regarding the proper way to gather, analyze, and apply data on a topic or event in research (Saunders, Lewis, and Thornhill, 2012). Furthermore, Saunders et al. (2012) go over three different categories of assumptions to consider when conducting a study: ontological assumptions (based on the truths discovered during the research), epistemological assumptions (based on the particular experience of an individual), and axiological assumptions (based on the researcher's ideas and beliefs). Based on these assumptions, Saunders et al. (2012) highlight five main research philosophies: positivism, post-positivism, postmodernism, interpretivism, and critical theory. The current research is underpinned using interpretive research philosophy as the primary aim of the research is to increase sustainability practices in the aviation sector by identifying which indicators are perceived by the main stakeholders as critical indicators of social sustainability, economic sustainability, and environmental sustainability. Also, interpretivism is a philosophy that asserts that truth may be subjectively appraised since everyone perceives and develops knowledge differently (Saunders et al., 2012).

3.2 Overview of Research Methods

Research methods are the techniques, strategies, and procedures used to gather data or evidence for analysis to discover new facts or establish a better comprehension of a

subject. Three research methods utilize varying tools for the collection of data. A research method depends on the researcher's study goal, and an appropriate research method and design must be chosen to achieve the research objectives. The three research methods include qualitative, quantitative, and mixed-methods research methods.

Qualitative research depends on image and text data (Creswell & Creswell, 2018). This method gathers data about humans' lived experiences and perceptions (Rutberg & Bouikidis, 2018). According to Creswell and Creswell (2018), qualitative research examines and understands individuals or groups' meanings ascribed to human or social problems. On the same note, Gunnell (2016) reveals that researchers utilize a qualitative method to accomplish an in-depth extraction of information within a natural setting. Data analysis in qualitative methods entails inductively building from particulars to general themes.

Further, the researcher makes interpretations of the data's meaning. Research reveals that the results obtained from qualitative research are more profound and specific; thus, they provide a holistic understanding of the social problem (Rahman, 2016). Qualitative research aids in the investigation of what happened and why, as well as in the interpretation and characterization of what happened.

On the other hand, quantitative research strives to attain correct and reliable measurements that allow for statistical analysis (Queirós, Faria, & Almeida, 2017). Rutberg and Bouikidis (2018) urge that this method utilizes a rigorous and controlled design to scrutinize phenomena using precise measurements. The quantitative method gathers numerical data that can be measured, ranked, or categorized through statistical analysis.

The quantitative research approach tests objective theories by examining the relationship between variables (Creswell & Creswell, 2018). Notably, it helps to uncover relationships or patterns and make generalizations.

Creswell and Creswell (2018) define mixed methods research as an approach that involves collecting qualitative and quantitative data, incorporates the two types of data, and uses discrete designs that comprise theoretical frameworks and philosophical assumptions. According to Snelson (2016), interpretations, while using mixed methods, research is drawn based on the combined strengths of data to answer the research questions. Usually, this method offers a holistic method of integrating and analyzing the statistical data with more profound contextualized insights. This is because integrating quantitative and qualitative data yields additional insight past the data provided by either qualitative or quantitative data (Creswell & Creswell, 2018).

3.3 Justification of the Research Method

The primary goal of this research is to identify the role of sustainability in Dubai's civil aviation sector operations and assess the optimal means of stakeholders' engagement for the aims of sustainable development of this industry. First, the study seeks to identify the critical categories of stakeholders engaged in the sustainability of Dubai's civil aviation sector and further examine the impact of each sustainability indicator on the stakeholders' engagement and the overall sustainability in the aviation sector. To identify sustainability indicators, the study uses stakeholder theory; thus, a qualitative research design is adopted. Also, phenomenology was chosen as a type of qualitative research method.

Phenomenology was chosen as the current methodology as it is a philosophy-based approach of qualitative inquiry based on the research participants' perspectives, perceptions, and views regarding a phenomenon, likely to lead to the concept of interactions for those who have encountered the phenomenon (Creswell, 2014). According to Lyotard (1991), phenomenology is the exploration of phenomena, which encompasses everything that occurs to an individual throughout their experience. Because the primary topic of this study is sustainability, the participants in this research will either have an understanding of sustainability or will be sustainability experts who have seen its occurrence in the aviation industry. Lyotard (1991) continues, "phenomenology is a qualitative research technique that facilitates the researcher to understand the significance and complexity of the emergence under evaluation, and to undertake experiments in newer areas of research and to explore an idea in its typical or happening environment. Qualitative researchers say that whenever writings are analyzed, the amount of data collection, which includes audio recordings, comprehension, and analysis of an activity, is significantly reduced (Moran, 2008). A phenomenological research design establishes the study's framework and setting, facilitating the identification of alternatives to the research aims (Miles, Huberman, and Saldana, 2014). The choice of phenomenology was decided for its versatility, as it provides for greater flexibility and the possibility to study the essential qualities of others' narratives, ideas, and viewpoints throughout the interviews (Lyotard, 1991). While researchers may use several methodologies, qualitative research is fundamentally driven by the desire to convey the human aspect of a tale. This

served as the impetus for the current research, which adopted a design that encourages the individual and collaborative expression of life events.

All the research questions are exploratory in nature. This is because they seek to gain a more profound comprehension of different categories of stakeholders engaged in Dubai's civil aviation sector's sustainability. The qualitative research method is adopted to answer these research questions as it facilitates understanding the stakeholders' behaviours, opinions, attitudes, and beliefs regarding the leading sustainability indicators in Dubai's civil aviation sector. Research reveals that the qualitative method allows for a greater comprehension of individuals' behaviours, opinions, attitudes, and beliefs concerning particular phenomena (Gair & van Luyn, 2016). The researcher developed semi-structured questions to gather the opinions of civil aviation members, middle and top-level management, airport and airline companies' stakeholder groups, and passengers. The qualitative approach is preferred since it offers a naturalistic perspective of the topic under review (Mohajan, 2018). This, therefore, makes the research more realistic. This method is also chosen because it offers an all-inclusive utilization of relevant data. Also, the qualitative research method offers a far more adaptable method. For example, if the investigators do not get relevant findings, they may swiftly adjust the topics, the location, or just about any element to enhance reliability. Many researchers, such as Alameeri et al. (2017), Singh, Sharma, and Srivastava (2019), and Acar, Beskese, and Temur (2018), have used qualitative research methods to support their research work and achieve the desired aims and objectives. The use of the qualitative research method in studies similar to the current research has guided the current research to be underpinned by the use of the

qualitative research method. Qualitative research methods and phenomenology enable the researchers to be significantly more imaginative regarding the subjects being studied and their methods.

3.4 Qualitative Study

The research instrument used to collect qualitative data includes a closed and open-ended questionnaire. The questionnaire was self-constructed to capture the research objectives and help answer the first two research questions. This research instrument was designed in simple English, and all the participants could provide data in the English language. A pilot study is generally conducted to ensure the reliability of the questionnaire being used in the study. However, a pilot study for the current study had not been carried out. Malmqvist, Hellberg, Möllås, Rose, and Shevlin (2019), Chenail (2011), and Poggenpoel and Myburgh (2003) have raised concerns about conducting a pilot study in qualitative research. The authors have mentioned that additional critical concerns may occur during the pilot conduct of qualitative interview methodologies by underlining fundamental difficulties that researchers face concerning "instrumentation accuracy" and bias control. Poggenpoel and Myburgh (2003) also reflect this concern and see the researcher as an "instrument" for data collection. To mitigate credibility issues, the authors underline the significance of researchers conducting interviews and spending time planning the fieldwork techniques that will be implemented, in addition to being well informed. The researcher in the current study conducted detailed and thorough interviews for the final data collection to avoid credibility concerns.

Qualitative data was collected from four stakeholders, including passengers, civil aviation, Airport companies, and national airlines. In addition, there are other stakeholders in the aviation industry, too, and it is crucial to distinguish the selection of the selected stakeholders from other stakeholders in the aviation sector. Also, stakeholder identity is one of the challenges of stakeholder theory, which does not allow the researchers to differentiate between groups and individuals who are relevant stakeholders and who are not for specific research (Phillips & Reichart, 2000). Individuals can provide various benefits to the organizations with which they have been affiliated. Yet, in the context of a specific corporation, the whole globe may be broken down into people who are members of the organization within a particular capacity for individuals who are not. The stakeholders are the owners of the business since it is their common goals that bring the members of the company altogether. As a result, the participants must have the authority to decide the firm's goals as long as they stay "inside the standards." As was previously said, participants must be free to determine what constitutes "achievement" and how it should be evaluated. However, the issue of stakeholder identity was focused upon by considering one of the aspects outlined by Chang et al. (2017). The authors mention that the primary stakeholders usually have a more direct impact or are affected by the organization than secondary ones, which in the current case are passengers, civil aviation, Airport companies, and airlines.

The questionnaire was divided into two parts, Part A and Part B. The first section of the questionnaires (Part A) collected the participants' demographic information through six questions, while Part B sought to determine the sustainability pillars. Besides gathering data on the key sustainability indicators, Part B questions also sought to determine

participants' knowledge regarding sustainability and their perspectives concerning Dubai's sustainability. Questions collecting participants' demographic information were closed-ended, while those seeking to identify the social, economic, and environmental sustainability indicators were open-ended. The data was collected via the focused groups with 148 participants in 13 groups of 11 people and one group of 5 participants. These sessions happened over five months, and each session used to be an hour long. All the sessions were conducted on Microsoft Teams because of the ongoing Covid-19 pandemic, and the participants were not comfortable with meeting face to face for discussions. All the sessions were recorded for every group of stakeholders. All the recorded sessions were heard 3 to 4 times and transcribed manually by the researchers. The transcripts prepared were used in the qualitative analysis.

3.4.1 Validity of the instruments

Validity may also be referred to as correctness or accuracy and is an eminent measure of the accuracy of the survey instrument. According to Baines and Chansarkar (2002), validity tells whether an item has measured what it is supposed to measure. Various methods are utilized for measuring validity, including face, criterion, content, and construct validity. According to Creswell and Miller (2000), the truth of research is influenced by the author's sense of correctness and relevance and their selection of paradigm or assumption.

3.4.2 Reliability of the Instruments

Reliability refers to the consistency of the study findings. Research reveals that for a study to be deemed reliable, another researcher must be in a position to obtain the same results under similar conditions (Smith &Albaum, 2005). Different ways are proposed for evaluating reliability, including internal consistency, intra-observer, test-retest, inter-observer, and intra-observer. Morse et al. (2002) mentioned the verification method to ensure data reliability in qualitative research. Verification is the process of examining, verifying, ascertaining, and validating.

Verification in a descriptive study as a part of a qualitative study refers to the procedures utilized throughout the research method to add gradually to assuring reliability and validity, and hence the thoroughness of research. These procedures are weaved throughout the investigation to ensure the development of sound output (Kvale, 1989) by recognizing and fixing flaws before their being incorporated into the evolving paradigm and subverting the assessment (Creswell, 1997). If qualitative research guidelines are applied, the research is self-correcting. For instance, a descriptive study is repetitive rather than sequential, and a skilled qualitative investigator will immediately switch between design and implementation to maintain accuracy between the preparation of an interview guide, literature review, selection of a sample from a population, data collection techniques, and analysis. Data are examined methodically, concentration is retained, and the information's fit and the theoretical process of investigation are regularly reviewed and validated. Verification techniques assist the researcher in determining whether to proceed, pause, or adjust the research study to attain reliability and validity while maintaining

integrity. In the current research, the researcher ensured verification to maintain the reliability of the research. Also, the questionnaire used in the current study was examined by one of the industry peers and supervisors to ensure that the questionnaire is valid and can be used further. Also, the questions that seemed like leading questions were removed to ensure the validity of the findings.

The factors linked to the qualitative approach's reliability include transferability, trustworthiness, dependability, credibility, and confirmability. For trustworthiness, the respondents were guaranteed confidentiality; thus, this resulted in confidence-building. Ensuring the respondents' confidentiality assisted in the data collection without the fear of exposure or victimization, and this resulted in more openness and uncensored sharing by participants. As such, this approves the aspect of trustworthiness in the qualitative approach.

3.4.3 *Sampling for Qualitative Method*

Sampling is the practice of choosing people to participate in research based on their ability to offer knowledge essential to the inquiry topic. Mack et al. (2005) observe that obtaining data from the whole sample population of specific research is often impossible. In qualitative research, sampling comprises selecting a group of people, known as the sample, for a particular study inquiry. The selection of individuals and the number of respondents for a specific research inquiry is determined by the study objectives and the characteristics of the sample to be drawn from a population. The sample population for this study comprised members of the civil aviation sector's middle and top-level management,

airport and airline operator companies' stakeholder groups, and passengers. Purposive sampling was employed to choose the desired sample size. It was essential to ensure the selected sample size was sufficient to intensify the comprehension of the sustainability indicators in Dubai's civil aviation sector. Research reveals that the purposive sampling technique allows the selection of respondents to provide comprehensive and inclusive information regarding the research questions (Hammarberg, Kirkman, & de Lacey, 2016). Gair and Van Luyn (2016) also urge that purposive sampling is subjective.

Usually, participants' selection relies predominantly on the criterion determined by the researcher, and the selected sampling technique is cost and time-saving. In this study, the sample size chosen included 148 participants from four key stakeholders, including passengers, civil aviation, Airport companies, and national airline managers. According to Leavy (2014), a sample size of at least 30 is adequate to expedite the data collection procedure using qualitative methods. However, in the current research, the aim of collecting data was from a different group of stakeholders, and the overall large sample size was considered for the study. The reason for selecting a large sample for the current study was to increase the findings' quality, accuracy, and validity. A large sample indicates and approximates the population appropriately. Sandelowski (1995) suggests that qualitative samples should be big enough to develop an 'innovative and increasingly detailed knowledge of the phenomena being studied and to allow for depth, case-based research of subjective data. According to Mocanasi (2020), the higher the valid data acquired from each individual, the researcher can focus on the complexity of the research, enhance the quality, and better the analysis of the data findings.

The following criterion was utilized to select the sample size:

- First, the chosen individuals had to have close contact with Dubai's civil aviation sector, such as frequent passengers and civil aviation, Airport companies, and national airline managers.
- Secondly, participants' ages ranged from below 25 to over 50 years of age to ensure that the researcher had a complete overview of all management levels, including junior and senior managers and occasional and frequent travellers.
- Lastly, the selected participants had to be Dubai's passengers to ensure they were genuinely interested in the issue of sustainability.

The sample selected comprised 35 managers from the civil aviation authority, 45 passengers, 38 managers from two national airlines companies in Dubai, and 30 managers from the airport company, which accounted for 148 participants.

3.4.4 Qualitative Data Collection

The study employs a method of gathering data that relies on utilising focus groups formed by members of various stakeholders' categories. The primary reason the researcher used focus groups to collect data is that it consumes less time than individual interviews. Also, focus groups allow the researcher to collect and investigate the opinions and views of different participants simultaneously. Focus group engagement can generate a vibrant combination among the researcher and participants, which is not present in individual interviews. As Morgan (1996) notes, the focus group discussions are highly different from

the total of interviews conducted because the participants and interviewer simultaneously question and clarify themselves. Focus groups are unique in their capacity to examine the amount and form of respondents' agreement and criticism (Morgan, 1996). Additionally, the researcher's capacity to ask respondents for contrasts and similarities of their experiences and perspectives, rather than collecting specific data from each individual to hypothesize on whether or not the respondents vary, is a strength of conducting a focus group.

Conducting focus groups was a second phase of the research. Focus groups were conducted with 148 participants. The discussion was done in English as the focus groups had mixed demographics, and everyone was comfortable with English. The discussions were audiotaped and not videotaped because participants were uncomfortable with video recordings. The questions asked in the interviews are presented in the Appendix. A narrative literature review identified all the sub-indicators of the leading indicators, such as social, economic, and environmental sustainability. Discussing the focus groups, the participants voted for the important sustainability indicators. The sub-indicators that got the highest votes were finally selected and used for analysis.

3.4.5 Qualitative Data Analysis

According to Albers (2017), the primary aim of data analysis is to connect the results retrieved from the analysis to generate meaningful conclusions. The qualitative data gathered is analyzed through thematic analysis. Thematic analysis is a qualitative method of data analysis that aims to identify, analyze, and interpret themes in qualitative

data. According to Lapan et al. (2011), the thematic analysis identifies patterns that identify the main themes of the gathered data. The thematic analysis method is adopted for this study to serve as a way to identify patterns from the gathered data to assist in answering the first two research questions. The themes are the sustainability indicators identified by the stakeholders. This is attributed to the fact that thematic analysis facilitates flexibility while choosing the theoretical framework. Thus, it works in hand with the chosen method of data collection.

The initial step of thematic analysis, familiarization with the data, happens during the data collecting procedure. In the first stage, the researcher read the developed transcripts and heard the recording multiple times to get familiarized with the data. The second step entails developing codes that engage the researcher further in the information and serve as the foundation for analysis. In this stage, the researcher highlighted the crucial principles in the transcripts, which were further used in developing themes and sub-themes. As the researcher proceeds through the coding process, they will likely begin to find parallels and trends in the data.

However, it is critical to remain engaged in coding the complete dataset while transitioning to the third step of theme construction. The researcher produced themes at this stage the same way a full copy of a work of literature does – they are not final and are subject to modification – with the fourth phase featuring an evaluation of prospective topics. The third and fourth steps were carried out consecutively, and accordingly, the researcher developed themes manually based on the codes developed in the previous stages. Many strategies and questions may be used to lead the process of establishing and

identifying themes and then constructing the complete analysis throughout the sixth and last step, which is preparing the report. Lastly, the researcher grouped the common themes and sub-themes.

The selection of individuals and the number of respondents for a particular research inquiry is determined by the study objectives and the characteristics of the sample to be drawn from a population. Only some of the participants discussed them. However, to decide which factors and sub-factors to consider for further data analysis, they were further ranked and prioritized using the AHP rank form presented in the appendix. Its results are discussed further in section 4.3.

3.4.6 Ethical Considerations

Ethics are the researcher's guiding norms and principles that guide them during the data collection process and the comprehensive study. They assist in achieving the study's aims and reducing or avoiding possible errors. The researcher in this study adheres to the necessary ethical standards to ensure sufficient protection of the respondents' personal information and the accuracy of the data collected. The researcher informed the respondents of the study's details, such as the research questions and the study objectives. This was done transparently following Ellingson's (2017) recommendations, such as ensuring the confidentiality of participants, maintaining ethical standards, and developing consent forms, among others. Consent forms were distributed among the respondents, who requested them to sign them as proof of their consent to participate in the research.

Besides, the researcher maintains the confidentiality and anonymity of study participants by protecting respondents' information from third-party accessibility. Hammarberg's (2016) recommendation uses code names and pseudonyms rather than real names. Besides, the researcher ensured that no possible identifiers were utilized, which ensured that the identification of the respondents was not possible. Ethical standards in this study were observed, thus ensuring the survey did not harm the participants. Finally, participants were given free will to leave the research process at any point. Participants were not required to provide reasons for leaving the research. Respondents were also allowed to withdraw their data after the research. The data collected was stored safely and was only used for the intended research.

After analyzing the qualitative findings, the third phase of the research was conducted, which was AHP. However, before discussing the details of AHP, it was necessary to outline the justification for selecting AHP to support the primary qualitative data.

3.5 Justification for Selecting AHP to Support Qualitative Research

Various multi-criteria decision-making methods allow researchers to select a better strategy and take appropriate decisions. Simple additive weighting (SAW) is the easiest of the Multiple criteria decision-making approaches employed because many practitioners are familiar with it (Afshari, Mojahed, & Yusuff, 2010). However, the scientific idea of the Weighted Product Method (WPM) is more "professional" than the short version of WPM (Zanakis, Solomon, Wishart, & Dublish, 1998). SHARE MCA is founded on the same premise as SAW, but it has been shown that non-technical stakeholders do not instantly adopt the approach. This may be related to the amount of time it takes to comprehend the

problem's hierarchy organization and the role of the corresponding normalizing coefficients with each indication (Zanakis et al., 1998). However, because AHP can be done with the help of proper mathematical formulas and algorithms, it allows various stakeholders to trust the process. Also, the AHP process enables the collection of stakeholders' views and rankings for better decision-making.

The current research included semi-structured interviews with important stakeholders throughout the process, including managers, aviation authorities, and highly experienced aviation professionals. However, the thematic analysis does not allow us to decide which factors and sub-factors to consider for further data analysis. So, they were further ranked and prioritized using the AHP rank form. AHP aided in the decision-making process in the civil aviation industry. Focus groups and the AHP model are interpretive and exploratory, which aided in the achievement of the study's purpose and goals and the resolution of the research questions. The research was considered exploratory in character because the variables and factors influencing tool usage are not entirely empirical. Most information sources are located inside the study region, and the data gathered is qualitative. AHP was also chosen because it will assist Dubai's aviation industry and its researchers in making sustainability-related choices and prioritizing sub-indicators contributing to sustainable development and growth.

3.6 Analytical Hierarchy Process

3.6.1 Overview of the AHP

The Analytic Hierarchy Process (AHP), which Thomas L. Saaty developed, is a commonly used technique for multi-criteria decision-making (Wind and Saaty, 1980). ‘analytic’ refers to breaking down decision issues into constituent components. ‘Hierarchy’ refers to the establishment of relative importance to resolve a decision dilemma. ‘Process’ relates to collecting data and decision-making necessary to acquire the outcomes (Badri, 1999; Bertolini and Bevilacqua, 2006; Wind and Saaty, 1980). By organizing a decision issue and its elements in a hierarchical framework, the AHP provides an edge in addressing a complicated issue. This notion enables decision-makers to understand the relationships between variables better. They may choose a suitable option that adds the maximum to the hierarchy’s criteria (Wind and Saaty, 1980). As a hierarchy, pair-wise comparison is an empirical process of decision-making. Simultaneously comparing two components using a ratio scale has the benefit of distinguishing two components with similar critical levels; consequently, it may yield a more precise ranking of components than rating a considerable number of factors (Bertolini and Bevilacqua, 2006). Since a sequence of pair-wise comparisons does evaluations, the AHP enables the retrieval of associated scores for items (or global priority) concerning the entire hierarchies of items. The AHP initially turns the series of pair-wise comparisons into matrices, which are consistent and then determines local priorities connected to items at the same degree of a hierarchy. The global priorities are then calculated by multiplying the local priorities with the global priorities of their upper-level items in the hierarchy (Wind and Saaty 1980; Saaty 2005).

Nevertheless, the use of AHP also has some limitations, such as high computing requirements even for simple issues, its subjectivity character and reliance on the transference of sentiments to quantitative judgments, and the additional time and effort required for a more significant number of pair assessments and comparisons (Munier & Hontoria, 2021). Despite its drawbacks, the AHP technique is essential for decision-making since, according to Kazibudzki cited in Canco, Kruja, and Iancu (2021), intuitive conclusions are not backed by facts and references and might look random. Also, the authors Canco et al. (2021) outline that decision-making cannot be generalized; it must be problem-specific. The critical stage in the decision-making procedure is to select the problem-appropriate decision-making approach to accomplish the goals and targets.

Additionally, AHP is a method that integrates quantitative and qualitative research methods and analysis. It decomposes one primary factor into smaller sub-factors. This is accomplished by developing several criteria and sub-criteria that may be employed to compare alternative solutions to an issue. These factors and sub-factors are organized hierarchically to make them simpler to grasp and compare on a more fundamental level. Comparisons may be made by using accurate statistics that possess ratio properties. The ratios may be used to establish weights or priority for the choice criteria that represent their relative relevance. Comparisons might be made on an overall level or among themselves. This is when the qualitative nature of the research is focused upon. Saaty (1994) proposed a scale of 1 to 9, with 1 denoting equal importance for each criterion and 9 denoting extreme importance, as represented in the following table.

Table 1: Importance of each criterion

Judgment	Verbal Equivalent	Explanation
1	Equal Importance	The respondents give both components equal importance.
2	Weak or Slight Importance	
3	Moderate Importance	Experience and judgment skew the balance somewhat in favour of one component over another.
4	Moderate plus importance	
5	Strong importance	Experience and judgment skew the balance somewhat in favour of one component over another.
6	Strong plus importance	

7	Very Strong importance	A significant preference exists for an element, and its dominance is reflected in practice.
8	Very, very strong importance	
9	Extreme importance	The evidence indicating that one element is superior to another is of the most excellent quality.

(Source: Saaty, 1994)

Concerning the 1 to 9 scale generally used in the AHP method, researchers Pöyhönen, Haemäläinen, and Salo (1997) have outlined that alternative scales can be used for decision-making purposes and ranking purposes. Nevertheless, Zhang, Liu, and Yang (2009) have also outlined using index scales over 1 to 9. However, the researchers further mention that scale depends on the research aim and context. If the research is about ranking essential aspects based on the rich experiences of implementing any application, it is crucial to use a 1 to 9 scale. As the current research was about collecting stakeholders' views on various sustainability-related aspects of the aviation sector, it is vital to use a 1 to 9 scale.

Another critical part of the AHP process is the verification of the uniformity of decisions or comparisons. Due to the tiring nature of the assessment procedure, participants

may be unsure or make bad judgements throughout the procedure. Computation of consistency ratios is required for these repeated checks. Consistency may be shown as follows: if criteria 1 and 2 are of equal importance, then their ratios should be similar to those of the other criteria. When this does not occur, contradictions in assessments become apparent. Saaty (1984) indicated that these discrepancies are acceptable if their amount is less, which is approximately 10% compared to the accurate measurements.

Saaty (1984) also identified three modes of AHP, which are distributive mode, ideal mode, and absolute evaluation mode. These three modes were identified to resolve an issue, which is referred to as rank reversal. Harker and Vargas (1987) mention that rank reversal is an issue that arises when the reordering of alternatives (choices available for the decision-maker) occurs along with the addition of new alternatives. Local priorities at every level of the hierarchy are equal in the distributive mode, which is useful when it is important to distinguish between the alternatives. According to Saaty (1994), the ideal mode is employed to determine the one best option regardless of additional alternatives. In the current research, the researcher focused on the perfect synthesis mode to handle circumstances where the inclusion or elimination of an 'insignificant' option should not and will not result in an alteration in the rankings of available options.

Another vital contribution inherent in the AHP is that the process verifies the consistency of the decisions or judgements. In a decision-making dilemma, conclusions must be consistent and not arbitrary. However, absolute consistency in our findings is impossible to accomplish in real-life settings. Inconsistencies may develop as a result of

changing conditions throughout the many comparisons. A certain level of inconsistency may be accepted as long as the decision-making process is generally consistent. However, it is significant to ensure the consistency of the decisions. According to Saaty (2000), a consistency ratio must be calculated to confirm the precision of pairwise comparisons. If the calculated consistency ratio can reach the threshold value of 0.1, then the decision-makers should reevaluate their preliminary choices (Saaty, 2000). Following all necessary pair-wise comparisons and modifications and ensuring that the consistency ratio is smaller than 0.1, decisions can be developed to assess the primary priority criteria and its further developed sub-criteria. In other words, the pairwise comparison matrix's standardized eigenvector is calculated using the pair-wise comparison matrix's relative weights. The eigenvalue is a statistical rating of the choices, indicating their relative importance. The other is that the ranking should represent the mathematical values' strength or directional value, as expressed by their ratios (Costa & Vansnick, 2008). Weights are then collated to create composite weights for the possible decisions. Finally, before reporting on measured decisions, it is necessary to establish the consistency of those judgments. Before calculating the consistency ratio, it is imperative to calculate the consistency index that represents the internal consistency. The following formula is used to evaluate the consistency ratio:

$$CI = (\lambda_{\max} - n) / (n - 1); \text{ where } \lambda_{\max} \text{ is the eigenvalue of the matrix} \quad (1)$$

Furthermore, the primary formula to calculate the consistency ratio is as follows:

$$CR = CI / RI \quad (2)$$

Where CR = Consistency Ratio

CI = Consistency Index

RI = Random Index

The Random Index is the consistency index of a randomly produced reciprocal matrix from 1 to 9. (RI). With a sample size of 500, Saaty (1994) calculated an average RI for the matrix up to 15. The following table XX lists the number of components in a matrix and the average RI for such matrices (ranging from 1 to 15). The Consistency Ratio is calculated by comparing CI to RI (CR). CR equals CI/RI. A consistency ratio of less than 0.10 is deemed acceptable.

Table 2: Random Index Values

Order of Matrix (From 1 to 15)	Random Index Value
1	0.00
2	0.00
3	0.58
4	0.90
5	1.12
6	1.24
7	1.32
8	1.41
9	1.45
10	1.49
11	1.51
12	1.54
13	1.56
14	1.57
15	1.58

AHP has been used significantly in the decision-making process. In addition, AHP has been improved and developed further and developed into Fuzzy AHP and Rough-AHP. Fuzzy Analytic Hierarchy Analytic Hierarchy Process (FAHP) is an extension of the Analytic Hierarchy Process (AHP) based on the notion of a fuzzy inference system and logic. The fuzzy AHP approach is used similarly to the AHP method. However, the only difference is that the Fuzzy AHP approach transforms the AHP scale into a fuzzy triangular measure for accessing priority (Ayağ & Özdemir, 2006; Büyüközkan, Feyzioğlu, & Havle, 2019). Additionally, fuzzy AHP can be used for technical aspects of the aviation industry. Fuzzy logic is one of the most well-known and widely applied observable methodologies, used in a range of environmental hazard research, such as flood susceptibility surveying (Das, 2020), identifying forest fires (Pourghasemi, Beheshtirad, & Pradhan, 2016), and underground water pollution (Turkey, Gorai, & Iqbal, 2013). Rough AHP examines the relative significance of categories depending on the professionals' choices. Rough AHP analyzes the alternative sites according to the values of the criterion (Aydoğan, 2011).

The following section provides details about the applications of AHP in terms of sustainability in the aviation sector.

3.6.2 Applications of AHP

There are various applications of AHP to ensure sustainability in the aviation sector. The following table highlights a brief description of sustainability indicators using AHP discussed by past researchers. The table also discusses their sample size consideration, primary objective to select AHP and specific field of research in the aviation sector.

Table 3: Applications of AHP in the Aviation Sector

Sr. No.	Research Article	Field of Study	Sustainability Indicator	The objective of using AHP	Considered Sample Size
1	Tuzkaya (2009)	Aviation Industry Sustainability	• Economic Sustainability • Environmental Sustainability	The analytic hierarchy process was used for enrichment assessment to evaluate transportation options regarding their environmental impact.	Not mentioned
2	Alameeri et al. (2017)	Airline Industry Sustainability	• Environmental Sustainability	The AHP provides a structure for identifying, categorizing, and prioritizing airline sustainability measures.	12
3	Singh, Sharma, & Srivastava, 2019	Airline – Reduction in Fuel Consumption	• Economic Sustainability • Environmental Sustainability • Social Sustainability	A considerable amount of fuel consumed by the aviation industry increases the economic and environmental sustainability issues. The AHP model allowed them to identify factors and prioritize them to assess their comparative relevance in the context of fuel-efficient aviation.	14
4	Acar, Beskese, & Temur, 2018	Sustainable Hydrogen production for the Aviation industry	• Economic Sustainability • Environmental Sustainability • Social Sustainability	AHP determines the sustainability of various hydrogen-generating technologies and processes, allowing the aviation sector to increase its economic and environmental performance.	3
5	Mahtani & Garg, 2018	Financial distress in the airline industry	• Economic Sustainability	The primary objective of adopting AHP in the current study was to identify all the elements that significantly influence the economic state of the business and to analyze them using a variety of instruments and procedures regularly. These identified critical elements	10

				may come from the firm's inner circumstances or the external factors in which the business works.	
6	Garg (2020)	Service Quality-Aviation industry	• Social Sustainability • Economic Sustainability	The primary objective of adopting AHP in the current study was to identify all the elements that represent a significant aspect of maintaining service quality in the aviation industry.	Not mentioned
7	Oghojafor & Adekoya, 2014	Customer satisfaction and sustainability in the aviation industry	• Social Sustainability • Economic Sustainability	The primary objective of adopting AHP in the current study was to identify the factors that lead to high customer satisfaction and experience. Providing high-quality service to consumers is critical for airline firms to remain sustainable in the aviation business.	20
8	Haddad & Fawaz (2013)	Maintaining the economic and environmental performance of jet fuel in the aviation industry	• Economic Sustainability • Environmental Sustainability	The sustainability of jet fuel is investigated utilizing the analytic hierarchy approach, considering technical, environmental, and financial factors (AHP). Two scenarios are considered, one emphasizing the environmental benefits and the other the economic benefits of the alternative jet fuel.	12
9	Lin and Li (2011)	Safety Management in the aviation industry	• Social Sustainability	The researchers used AHP to determine various intervention options based on various factors for ensuring safety in the aviation industry. The researcher also outlined that AHP would help decision-makers evaluate the many techniques available for building an aviation safety control plan based on various factors.	19

10	Chen, Lin, & Vincent, 2017	Overcoming the human factors errors in the aviation industry	• Social Sustainability • Environmental Sustainability	The Analytic Hierarchy Process was used to determine the relative importance of various techniques for preventing dangerous behaviour. This research aims to examine the effect of various human error intervention strategies on various dangerous activities. Each intervention strategy should have a distinct significance concerning the targeted object. As a result, this research questioned various specialists in various sectors to ascertain actual difference weights and the relative importance of the five indicators such as organizational, environmental, technology, human, and effectiveness.	6
11	Chen, Yang, & Chang, 2014	Maintaining safety in the aviation industry	• Social Sustainability	The AHP was implemented in the research to evaluate the factors that affect safety in the aviation industry.	59
12	Di Gravio, Mancini, & Patriarca, & Costantino, 2015	Air Traffic Management (ATM) safety review process	• Social Sustainability	The article proposes an enhancement to the Air Traffic Management (ATM) safety review process to provide active security factors using the AHP method. Also, the AHP method allowed the researchers to identify accidents, events, and aviation issues, increasing the risk for the customers and employees.	Not mentioned
13	Eshtaiwi, M., Badi, I., Abdulshahed, A., & Erkan, T. E. (2018)	Best performing airport based on some key indicators of	• Economic Sustainability • Environmental Sustainability • Social Sustainability	The primary direction is to utilize the AHP approach to determine the weights and to identify the best international airport in Libya depending on the principles of the KPIs, such as services for the passengers, Airside Area, Economic Aspect, Security and Stability, and	10

		the aviation industry		Environmental, which helped the researcher in deciding to determine a high-performance airport.	
14	Cicone Udaeta, & Grimoni, 2008 Galvão, 2008	Enhancing the Integrated Resource planning for maintaining the metropolitan airport	• Economic Sustainability • Environmental Sustainability • Social Sustainability	The analytic hierarchy process was an intriguing method for measuring the social, environmental, and economic factors, assigning relative values to each possibility and aggregating these values to arrive at a more optimal answer. Utilizing the AHP was an effective method for modelling and operationalizing total costs, mainly when qualitative parts of the study are included.	12
15	Yoo and Choi, 2006	Improving the screening system at the airports	• Social Sustainability	The AHP was implemented to examine general perceptions on improving the screening system at the airports.	19

Based on the findings outlined in the following table, it can be observed that extensive research has been carried out to maintain different forms of sustainability in the aviation industry. Three primary forms of sustainability and the leading indicators were identified from the qualitative research. Environmental, Economic, and social sustainability were primarily discussed in the literature. Also, as observed, the AHP was mainly used to make decisions and prioritize them to enhance the performance and functions in the aviation industry.

These previous studies demonstrate how the AHP model, as a stand-alone model, is an appropriate method for similar studies. For example, Singh et al. (2019), Acar et al. (2018), Eshtaiwi et al. (2018), and Cicone et al. (2008) have focused on the factors which determine all forms of sustainability, such as environmental, economic, and social sustainability. In addition, the researchers adopted AHP for determining and analyzing social, environmental, and economic variables, giving relative values to each possible outcome, and combining these elements to arrive at a more optimum solution. Also, Chen et al. (2014), Di Gravio et al. (2015), Yoo and Choi (2006), and Lin and Li (2011) primarily focused on the aspect of social sustainability using AHP, which helped the researcher in managing and controlling safety in various aspects of the aviation industry. Additionally, Garg (2020), Mahtani and Garg (2018), and Oghojafor & Adekoya (2014) focused on economic and social sustainability by using the AHP method. Some other researchers, such as Chen et al. (2017), Haddad & Fawaz (2013), Tuzkaya (2009), and Alameeri et al. (2017), primarily focus on environmental sustainability, which allowed the researchers to adopt AHP for determining the relative value of a variety of various approaches for averting potentially risky conduct in the

aviation industry in terms of safety of environment and customers. In the current study, the AHP model will enable the analysis and comparison of the primary sustainability indicators in the aviation industry from different stakeholders, which can help align these indicators and thereby increase the overall sustainability in the UAE's aviation industry.

3.6.3 Sample Characteristics

The sample of the current study is in line with past studies by Mahtani and Garg (2018), Eshtaiwi et al. (2018), and Cicone et al. (2008), which employed sample sizes between 10 and 20. The sample was selected based on a criterion, such as the experience of the individuals. The experts who had experience of at least ten years were selected for the interviews performed in the third phase (AHP phase). The current study was built on 15 selected respondents: all experts on sustainability with five to ten years of managerial experience in the aviation industry in their respective organizations. They occupied roles such as chief analysts, senior managers, economic experts, sustainability experts, and environmental experts. Also, the stakeholders included male and female participants who contributed significantly to the study. Also, the experts selected had more than eight years of experience, and their age was 30 years or more than 30 years.

Also, different stakeholders belonged to different categories, as presented in the following table.

Table 4: Stakeholders and their Categories

Stakeholder	Stakeholder Category
First Class Passengers Business Class Passengers Economy Class Passengers	Passengers

Aviation Manager Economic Expert Environment Expert Social Sustainability Expert	Civil Aviation Authority
Ground Handling Manager Chief Analyst Infrastructure Manager	Airlines
Airport Manager Senior Department Managers (Sustainability) Finance Manager CSR Authority	Airports

The figure below depicts the operationalized AHP model developed from qualitative research.

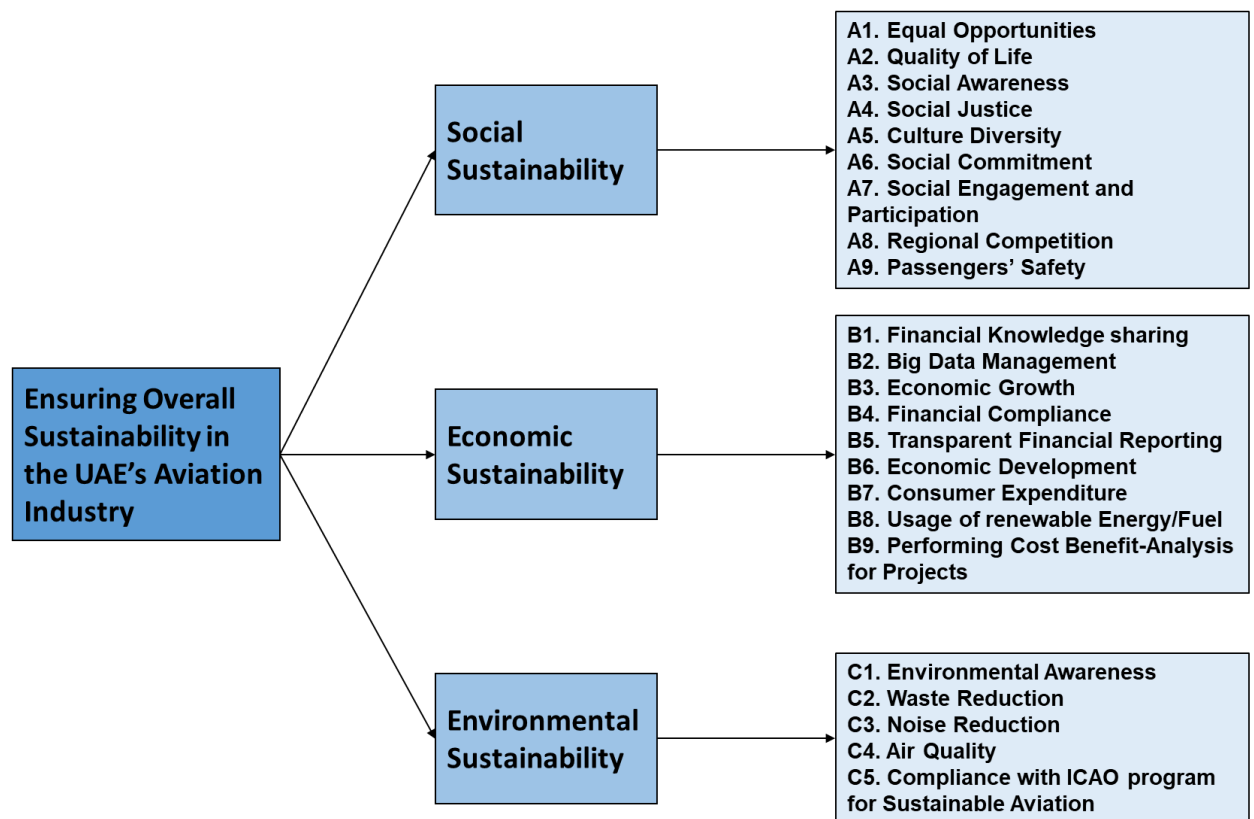


Figure 6: AHP Model for the Current Study

After developing the model, the researcher primarily focused on developing a pair-wise comparison matrix, represented as follows.

Table 5: Pair-wise Comparison Matrix of Three Main Factors

	1 - Equal Importance	2 - Weak or Slight Importance	3 - Moderate Importance	4 - Moderate plus importance	5 - Strong importance	6- Strong plus importance	7 - Very Strong importance	8 - Very , very strong importance	9 - Extreme Importance	
Social Sustainability										Economic Sustainability
Social Sustainability										Environmental Sustainability
Economic Sustainability										Environmental Sustainability

Afterwards, a comparison of sub-factors for each of the sustainability factors. For example, for economic sustainability, the comparison table looked like this (see appendix for complete questionnaire):

Table 6: Pair-wise Comparison Matrix of Sub-factors

	1 to 9 Scale Elements as represent ed in table 1 above.	
B1. Financial Knowledge sharing		B2. Big Data Management
B1. Financial Knowledge sharing		B3. Economic Growth
B1. Financial Knowledge sharing		B4. Financial Compliance
B1. Financial Knowledge sharing		B5. Transparent Financial Reporting
B1. Financial Knowledge sharing		B6. Economic Development
B1. Financial Knowledge sharing		B7. Consumer Expenditure
B1. Financial Knowledge sharing		B8. Usage of renewable Energy/Fuel
B1. Financial Knowledge sharing		B9. Performing Cost Benefit-Analysis for Projects
B2. Big Data Management		B3. Economic Growth
B2. Big Data Management		B4. Financial Compliance
B2. Big Data Management		B5. Transparent Financial Reporting
B2. Big Data Management		B6. Economic Development
B2. Big Data Management		B7. Consumer Expenditure
B2. Big Data Management		B8. Usage of renewable Energy/Fuel
B2. Big Data Management		B9. Performing Cost Benefit-Analysis for Projects
B3. Economic Growth		B4. Financial Compliance
B3. Economic Growth		B5. Transparent Financial Reporting
B3. Economic Growth		B6. Economic Development
B3. Economic Growth		B7. Consumer Expenditure
B3. Economic Growth		B8. Usage of renewable Energy/Fuel

B3. Economic Growth		B9. Performing Cost Benefit-Analysis for Projects
B4. Financial Compliance		B5. Transparent Financial Reporting
B4. Financial Compliance		B6. Economic Development
B4. Financial Compliance		B7. Consumer Expenditure
B4. Financial Compliance		B8. Usage of renewable Energy/Fuel
B4. Financial Compliance		B9. Performing Cost Benefit-Analysis for Projects
B5. Transparent Financial Reporting		B6. Economic Development
B5. Transparent Financial Reporting		B7. Consumer Expenditure
B5. Transparent Financial Reporting		B8. Usage of renewable Energy/Fuel
B5. Transparent Financial Reporting		B9. Performing Cost Benefit-Analysis for Projects
B6. Economic Development		B7. Consumer Expenditure
B6. Economic Development		B8. Usage of renewable Energy/Fuel
B6. Economic Development		B9. Performing Cost Benefit-Analysis for Projects
B7. Consumer Expenditure		B8. Usage of renewable Energy/Fuel
B7. Consumer Expenditure		B9. Performing Cost Benefit-Analysis for Projects
B8. Usage of renewable Energy/Fuel		B9. Performing Cost Benefit-Analysis for Projects

3.6.4 *Ethical Considerations*

Research ethics are critical for high-quality study since protocols, processes, fairness, permissions, and secrecy must all be considered to guarantee that participants are enrolled in genuine or authentic research (Schumacher and McMillan, 2010). The process would begin with an introduction page outlining the study's ethical standards. If participants select accept and next, it indicates that they agreed to complete the survey voluntarily. Participants would be given a choice to opt-out or withdraw from the research at any moment if they did not want to continue participating. Other ethical concerns were maintaining the participant's secrecy and confidentiality. No non-essential private details about individuals or their organizations were asked to be shared with the researchers. The researcher has taken steps to verify that no unauthorized entity has access to the obtained data. For instance, the entire data will be password protected, and no third person will have access to it. When participants cannot engage fully, the researcher will not threaten them. Respondents were also assured that their participation in the present study would not impact their organisational function.

Additionally, the researcher confirmed that the data collected would be destroyed five years after the completion of the study. The researcher collected data in an entirely ethical and non-coercive manner, and he did not gather data from individuals working in jobs similar to those of an investigator to eliminate the chance of indirect coercion. Finally, the researchers maintained their integrity, dignity, and impartiality throughout the investigation.

3.7 Chapter Summary

The current chapter primarily focuses on the interpretivism research philosophy, as it provides a foundation for the current research. Also, the interpretivism research philosophy helped the researcher collect participants' viewpoints regarding social, environmental, and economic sustainability factors. The chapter was followed by an overview of the AHP model along with the application of AHP in different fields of the aviation industry, which primarily focuses on maintaining sustainability. The applications of AHP in the aviation industry allowed the researcher to determine the critical factors of each sustainability aspect. The following section discussed the AHP framework for the current study, which helped in assessing all the factors related to the sustainability factors of the UAE's aviation industry. Lastly, a discussion regarding ethical considerations was carried out. The next chapter will focus on the analysis and findings of the current study.

4 Data Analysis and Results

4.1 Introduction

This chapter covers the analysis of the collected data to answer the proposed research questions. The chapter is organized into various sections, with the first section presenting an analysis of the qualitative data collected using focus group interviews. The subsequent section presents the analysis and presentation of the research findings from quantitative data gathered using questionnaires. The qualitative data is analyzed manually using thematic analysis. This entails scrutinizing the collected data and identifying relevant information relating to the proposed research questions. After identifying the relevant information, themes and subthemes are identified and further discussed based on the research questions.

4.2 Qualitative Data Analysis

The qualitative part seeks to determine the critical stakeholders in Dubai's civil aviation sector and identify the leading sustainability indicators in the aviation sector. Qualitative data is analyzed using thematic analysis. Notably, thematic analysis is a qualitative data analysis approach designed for interpreting the study findings. According to Lapan et al. (2011), this analysis method identifies patterns that assist in identifying the data's key themes. Thematic analysis is adopted in this study to assist in identifying patterns from the gathered data that could answer the first two research questions. Here, the themes are the sustainability indicators identified by different stakeholder groups in Dubai's aviation sector. The researcher chooses to use thematic analysis because it simplifies the qualitative data assessment. This is attributed to its

enabling flexibility while selecting a theoretical framework. The analysis findings are presented as per the narratives developed by the participants during the focus group sessions. The first section, under the qualitative data analysis, presents the demographic characteristics of the respondents. The subsequent sections outline all the themes identified, and the results are presented in table format.

4.2.1 Demographic Characteristics of the Qualitative Data

Regarding the qualitative part's demographic characteristics, the results reveal that the interviewees were at least 25 years of age. These participants had at least 12 months (1 year) of experience in their respective fields. The respondents for the qualitative study comprised 35 members of the civil aviation authority, 30 members from the airport company, 38 members from the airline Operator Company, and 45 passengers, which accounted for 148 respondents. Out of the 148, 93 are males, while 55 are females. Fifty-one respondents are graduates, 82 are postgraduates, and the remaining 15 are doctorates (See Table 1 below).

Table 7: Respondents' Demographic Breakdown

		Passengers	Civil Aviation Authority	Airport Company	Airline Company
Number of Respondents		45	35	30	38
Age group (Years)	25-30 years.	5	5	5	8
	31-40 years.	6	4	11	9
	41-50 years.	12	6	4	5
	51-60 years	3	7	6	10
	60+ years	19	13	4	6
Gender	Female	18	13	12	12

	Male	27	22	18	26
Level of Education	Graduate	25	6	10	10
	Postgraduate	16	25	15	26
	Doctorate	4	4	5	2
Work Experience (Years)	1-5 years	10	8	15	18
	5-10 years	25	12	10	12
	Above 10 years	10	15	5	8

N=148

4.2.2 Different Dimensions of Sustainability

To answer the first research question that seeks to determine the various sustainability indicators, the researcher uses thematic analysis to group together the dimensions of various sustainability indicators presented by the respondents. This section presents the findings of the different dimensions of sustainability, as presented by the participants. The section will be divided into four parts, with the first sub-section presenting the results for the stakeholders' view of social sustainability indicators. The subsequent sub-sections present the stakeholders' views of economic and environmental sustainability indicators, respectively. The last sub-section presents the commonalities among all stakeholders' views of sustainability indicators in Dubai's aviation sector.

4.2.2.1 Stakeholders' View of Social Sustainability Indicators

This sub-section describes the views of the various groups of stakeholders concerning the significant social sustainability indicators in Dubai's civil aviation sector. As presented in Table 2 below, civil aviation authorities and the airports pointed out the most social sustainability indicators. Notably, airports recognized a total of 24 different indicators of social sustainability, while the airlines pinpointed 19 social

sustainability indicators. Besides, the civil aviation authorities and passengers also identified 21 and 9 social sustainability indicators, respectively. From the findings, it was evident that there was a divergence of views among the various stakeholder groups concerning the important social sustainability indicators.

Table 8: Stakeholders' View of Social Sustainability Indicators

Stakeholders	Stakeholder's Views			
Passengers	1. High education	6.	Educational campaigns	
	2. Culture Diversity Adoption	7.	Community Development	
	3. Corporate Social Responsibility	8.	Assuring passengers' rights	
	4. Quality of life	9.	Equal opportunities	
	5. Law and Governance			
Civil Aviation Authority	1. Equal Opportunities	12.	Regional relations	Political
	2. Social commitment	13.	Social security	
	3. Culture diversity	14.	Social justice and equity	
	4. Readiness and contingency plan	15.	Social Loyalty	
	5. Intergenerational equity	16.	Community trust	
	6. Social awareness	17.	Aviation quality control	
	7. Social happiness	18.	Labor rights	
	8. Occupational health and safety	19.	National Noise level	
	9. Emiratization (nationalization)	20.	Intergenerational equity	
	10. Human rights assurance	21.	Quality of life	
	11. Social engagement and participation			

Airports	1. Airport jobs opportunities	13. Regional competition
	2. Intergenerational equity	14. Social commitment
	3. Social security and trust	15. Social coherence
	4. Social Loyalty	16. Readiness and contingency plans
	5. Passengers' safety	17. Cultures diversity
	6. Social engagement and participation	18. Organizational change readiness
	7. Emiratization	19. Airport life quality
	8. Culture diversity	20. Occupational health and safety
	9. Customer happiness	21. Regional Equity
	10. Dependency ratio	22. Social justice
	11. Governance	23. Social awareness
	12. Human assets and labour rights	24. Social benefits and rewards
Airlines	1. Aircrew health and safety	12. Social awareness
	2. contingency plans	13. Social benefits
	3. Culture diversity	14. Social commitment
	4. Emergency readiness and	15. Social engagement and
	5. Flexibility	16. Social justice
	6. Jobs opportunities	17. Social Loyalty
	7. Labor rights	18. Social security and trust
	8. Organizational development	19. the workforce
	9. participation	20. Globalization
	10. Passengers' safety	21. Regional competition
	11. Passengers' satisfaction	22. Share of UAE nationals

Based on the demographics outlined in section 4.2.1, a critical discussion was observed while discussing some of the indicators in the focus groups. Females and males had different perspectives on quality of life and equal opportunities, while not a significant difference was observed in other indicators and sub-indicators based on demographics.

4.2.2.2 Stakeholders' View of Economic Sustainability Indicators

This section presents the findings of the stakeholders' views concerning the critical economic sustainability indicators in Dubai's civil aviation sector. According to the results, as presented in Table 3 below, the airlines, the civil aviation authority, and airports pointed out nearly an equal number of indicators. Notably, airports and the civil aviation authority recognized 24 economic sustainability indicators. Besides, airlines and passengers identified 21 and 12 economic sustainability indicators, respectively. The results are presented below.

Table 9: Stakeholders' View of Economic Sustainability Indicators

Stakeholders	Stakeholders' Views	
Passengers	1. Business diversity	7. Revenues and expenses management
	2. Cost of living	8. Services & prices management
	3. Cost savings	9. Smart growth
	4. Knowledge sharing	10. Smart travelling solution
	5. Long-range planning	11. Social engagement
	6. Research & development-pending	12. Usage of alternative energy

Civil Aviation Authority	1. Air traffic management efficiency	13. Energy consumption
	2. Anti-corruption policies and oversight	14. Financial productivity
	3. Big data management	15. Inflation rate
	4. Civil aviation accidents prevention	16. Investments
	5. Compliance	17. Political relations
	6. Contribution of air transport to the national gross domestic products	18. Sharing knowledge
	7. Cost reduction policies	19. Successful bilateral agreements on air rights
	8. Dynamic efficiency	20. Sustainable development goals (SDGs)
	9. Economic development	21. Trading
	10. Economic growth	22. Volume of air transport
	11. Economic ranking	
	12. Employment population ratio	
Airlines	1. Airlines' ranking	12. Regular financial audits
	2. Big data management	14. Competitiveness
	3. Civil aviation fuel consumption	15. Aircraft (a380) transporting a maximum number of passengers.
	4. Compliance	16. Waste production
	5. Dynamic efficiency	17. Renewable fuel/energy for civil aviation
	6. Economic development	18. Renewable sources of energy
	7. Economic growth	19. Automated services systems
	8. Knowledge transformation	20. Policies for cost reduction
	9. Consumer expenditure	21. Performing cost-benefit analysis for projects
	10. Transparent reporting	

11. Airlines' resources consumption

Airports	1. Airport resources consumption	13. Inflation rates
	2. Automated services systems	14. Infrastructure continuous improvement
	3. Big data management	15. Investments
	4. Civil aviation fuel consumption ration	16. Performing cost-benefit analysis for its projects
	5. Consumer expenditure	17. Planned aerodrome expansions
	6. Dynamic efficiency	18. Renewable energy resources
	7. Economic growth	19. Renewable fuel/energy for civil aviation
	8. Economic ranking	20. Sustainable development goals
	9. Energy consumption	21. Transparent reporting
	10. Environment-related charges	22. Waste production
	11. Increased airlines movement	
	12. Increased passengers' movement	

Based on the demographics outlined in section 4.2.1, no significant difference was observed in economic sustainability indicators and sub-indicators based on demographics.

4.2.2.3 Stakeholders' View of Environmental Sustainability Indicators

This section presents the views of different categories of stakeholders on the environmental sustainability indicators in Dubai's aviation sector. According to the findings, airports slightly identified a higher number of indicators, while passengers pinpointed the smallest number of indicators compared to other stakeholders. The civil

aviation authorities identified ten environmental sustainability indicators. Although environmental sustainability is the main issue of concern in the sustainability debate globally, the recognized number of indicators was lower than the sustainability indicators recognized for economic and social sustainability. This means that stakeholders may have views that differ from the average views in the sustainability debate and that economic and social sustainability may be prioritized. The findings are presented in Table 4 below.

Table 10: Stakeholders' View of Environmental Sustainability Indicators

Passengers	1. Appropriate resources management 2. Habitat restoration and Preservation 3. Resource relocation 4. Research and development for new non-fuel-based propulsion systems	5. Environment protection policies 6. Practices oversight 7. Awareness 8. Usage of clean energy
Civil aviation Authority	1. Compliance with the ICAO program for sustainable civil aviation 2. Emissions reduction 3. Air quality 4. Awareness 5. Climate change	6. Noise reduction 7. Epidemiology knowledge 8. Carbon footprint 9. Airport land use 10. Rules and regulations
Airlines	1. (GHG) emissions 2. Adoption of environmentally friendly technologies 3. Air quality	6. Aircraft lifespan and disposal 7. Awareness 8. Climate change

	4. Aircraft fleet efficiency	9. CO2 emissions reduction
	5. Aircraft greenhouse gas	10. Emissions trading scheme
		11. Waste reduction
Airports	1. Energy management	9. Adoption of environmentally
	2. Noise reduction	10. Airport site CO2 emissions reduction
	3. Waste reduction management	11. Rationing water consumption
	4. Electrical vehicles usage	12. Carbon footprint
	5. Fuel reduction policies for the airside vehicles	13. Airport water quality
	6. Air quality	14. Compliance with the ICAO program for sustainable civil aviation
	7. Epidemiology knowledge	
	8. Reduction of foreign objects damage (FOD) at the airside of the airport	

Based on the demographics outlined in section 4.2.1, no significant difference was observed in environmental sustainability indicators and sub-indicators based on demographics because everyone had a very similar perception of the importance of environmental aspects.

4.2.2.4 Commonalities Among all the Groups of Stakeholders' Views of Sustainability Indicators

Some of the critical views of the participants were collected during the focus groups and were combined into commonalities presented in figure 7. Some of the standard views of the participants that led to the development of social indicators are presented in the following table.

Table 11: Development of Social Sustainability Indicators

Participant	Excerpts from Transcripts	Themes (Sub-Indicators)
P5	“The people in the aviation industry should be given the same chances irrespective of their gender, age, societal status, or any of such aspects. As an employee in the industry, I know how important it is to maintain equality in the company.”	Equal Opportunity
P65	“Nowadays, everyone who cares for the planet is focused on sustainability because we know how important it is because it allows the people to live better lives and change their actions to save themselves and the planet.”	Quality of Life
P32	“Honestly, awareness is highly needed to improve sustainability in any field. If I can give you an example: If I take an action that would benefit the planet, like stop using plastic bags, the person living with me, like my kids or husband, would also be motivated to take the same action. Like next time they go shopping, they would know that they need to take a cloth bag, which is tiny but a significant step towards sustainability. So when they do that, other people in the store would see it and get motivated to do the same. One person makes others aware of maintaining sustainability, and this cycle continues. A similar thing also happens in the aviation industry.”	Social Awareness
P127	“I think everyone has some responsibility towards the environment, and they have to do justice to their surroundings, and they can’t use it just randomly and ignore their responsibility.”	Social Justice
P49	“In the aviation industry, especially at employment, one can increase social sustainability by ensuring that they are not racists and are accepting all the cultures together. In my experience, the aviation industry has many cultures (employees from different countries), dealing with passengers of different cultures, and so much diversity. All the employees, I feel, should empathize with other cultures to maintain sustainability in the aviation industry.”	Culture Diversity

P18	“People should be committed to the environment, and that should not be exploiting the available resources.”	Social Commitment
P93	“In our company and specifically in my division, we give much importance to the environment and doing eco-friendly things, and while doing these activities, we make sure that other people are also engaging and participating with us to take steps that can benefit the company in an overall manner.”	Social Engagement and Participation
P23	“Competition is tricky, but it can benefit the companies and employees. Let me give you a case. If one airline company is taking sustainable measures, and in current times many customers are all about sustainability, some customers focus on air emissions before they focus on the prices. So if a competing airline has more focus on sustainability, there is a chance that customers would fly with that airline.”	Regional Competition
P54	“Safety of passengers is everything in the aviation industry because of past incidents like crashes, terror attacks, and whatnot. Every airline's first and foremost priority should be the safety of their passengers.”	Passengers' Safety

The above figure shows the development of social indicators, and the remaining indicators were also developed similarly; accordingly, the commonalities in figure 8 were developed.

Figure 7 below presents commonalities among the views of different stakeholder groups based on the findings presented in tables 3, 4, and 5. The typical social sustainability indicators identified include equal opportunity, passengers' safety, quality of life, regional completion, social awareness, culture diversity, social commitment, and social engagement and participation. The identified economic indicators of sustainability include knowledge sharing, bid data management, compliance with economic growth, transparent reporting, economic development, consumer expenditure, renewable energy/fuel, and performing cost-benefit analysis for

projects. Besides, the expected environmental indicators include environmental awareness, waste reduction, noise reduction, air quality, compliance with ICAO, and a program for sustainable growth.

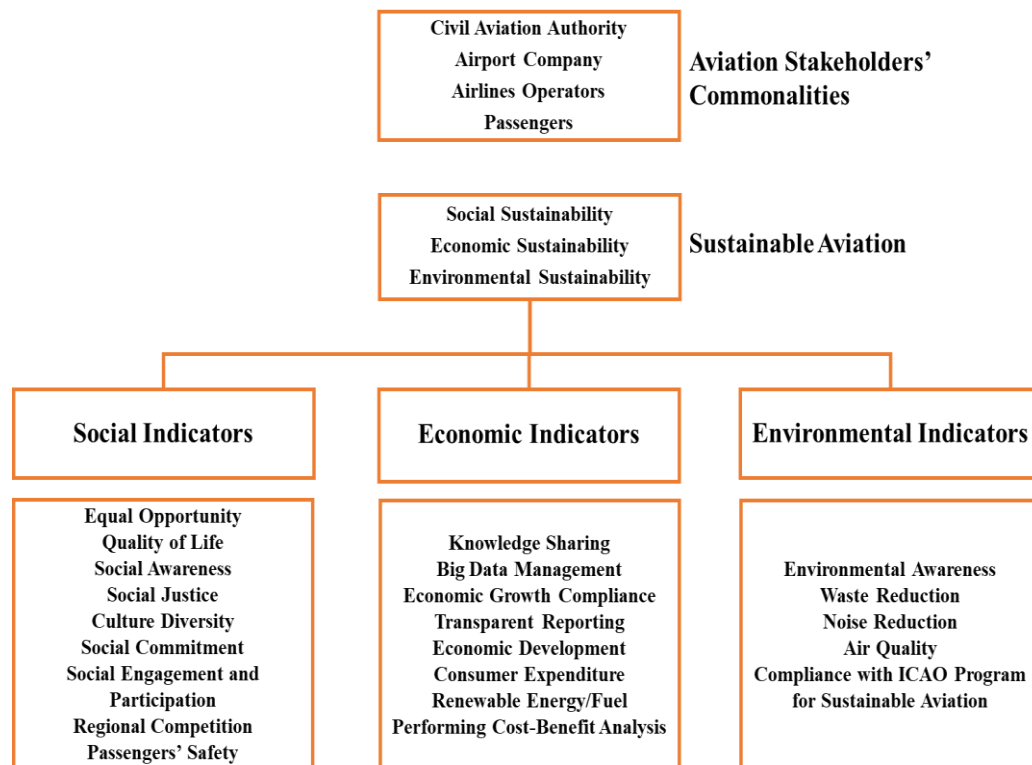


Figure 7: Commonalities Among all the Groups of Stakeholders' Views of Sustainability Indicators

4.3 AHP Data Analysis

4.3.1 Priority of Main Indicators

A total of 15 aviation industry stakeholders participated in the current research. The data was collected using a pairwise comparison matrix of the primary indicators and their sub-indicators. The first step of conducting the AHP was carrying out the pairwise comparison and developing a pairwise comparison matrix based on the stakeholders' responses, as presented in the following table.

Table 12: AHP matrix from pairwise comparisons of Main Indicators

	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	R 14	R 15	
Social Sustainability	1 / 2	1 / 3	1 / 2		1 / 4	1 / 8	1 / 8	1 / 5	1 / 6	1/ 6		1/ 4	1/ 7	1/ 5	2	Economic Sustainability
Social Sustainability				1 / 5										1/ 4	4	Environmental Sustainability
Economic Sustainability							1 / 8	4	5	2	1/ 2	7	7	4	1/ 2	Environmental Sustainability

Following this, a norm matrix for the leading indicators was developed, as presented in the following table.

Table 13: Norm Matrix for Main Indicators

Com Priority	Social Sustainability	Economic Sustainability	Environmental Sustainability
Social Sustainability	1.00	0.86	2.83
Economic Sustainability	1.16	1.00	4.08
Environmental Sustainability	0.35	0.25	1.00

After developing the norm matrix, the normalized matrix was developed as represented in the following weights. Values calculated in this matrix were used to calculate priority weights.

Table 14: Normalized Matrix for Main Indicators

Com Priority	Social Sustainability	Economic Sustainability	Environmental Sustainability
Social Sustainability	0.40	0.41	0.36
Economic Sustainability	0.46	0.47	0.52
Environmental Sustainability	0.14	0.12	0.13

Priority weights were calculated as presented in the following table, and ranks were assigned according to the priority weights. Stakeholders prioritized and prioritised economic sustainability, followed by social and environmental sustainability. The highest rank, with 48%, was economic sustainability, 39% was social sustainability, and 13% was environmental sustainability. The priority weights and ranks are given to each indicator, as shown in Table 14.

Table 15: Priority Weights and Ranks of the Main Indicators

Main Indicators	Priority Weights	Rank
Economic Sustainability	0.48	1
Social Sustainability	0.39	2
Environmental Sustainability	0.13	3

After calculating priority weights, eigenvalues were calculated because the eigenvalues are required to describe the priorities produced from an affirmative reciprocal pair-wise comparisons judgment matrix.

Table 16: Eigen Values of Main Indicators

	Social Sustainability	Economic Sustainability	Environmental Sustainability	Total
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Eigen Value	0.98	1.02	1.01	3.01
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Furthermore, the consistency ratio was calculated to ensure that all the judgments were accepted and valid.

$$CI = \frac{\text{Eigen Values} - n}{n - 1}$$

$$CI = \frac{3.01 - 3}{2}$$

$$CR = CI / RI$$

$$CR = 0.003/0.52$$

$$CR = 0.006$$

$$CR = 0.6 \% < 10\%$$

As the value of CR is less than 10%, all the judgments were accepted.

4.3.2 Social Sustainability

There were nine sub-indicators to evaluate social sustainability. Fifteen stakeholders performed a pairwise comparison, presented in the appendix. Following the pairwise comparison, the norm matrix for social sustainability indicators was evaluated as presented in the following table.

Table 17: Norm Matrix for Social Sustainability Indicators

Com Priority	A1. Equal Opportunities	A2. Quality of Life	A3. Social Awareness	A4. Social Justice	A5. Culture Diversity	A6. Social Commitment	A7. Social Engagement and Participation	A8. Regional Competition	A9. Passengers' Safety
A1. Equal Opportunities	1.00	2.31	1.60	1.27	2.74	0.72	2.30	1.584	0.34
A2. Quality of Life	0.43	1.00	1.72	3.23	3.87	2.28	1.74	2.300	0.33
A3. Social Awareness	0.63	0.58	1.00	3.67	4.60	1.46	1.70	1.88	0.52
A4. Social Justice	0.79	0.31	0.27	1.00	3.12	1.94	1.53	1.30	0.47
A5. Culture Diversity	0.37	0.26	0.22	0.32	1.00	0.83	1.35	1.34	0.41
A6. Social Commitment	1.40	0.44	0.69	0.52	1.21	1.00	1.36	2.28	0.41
A7. Social Engagement and Participation	0.44	0.58	0.59	0.65	0.74	0.73	1.00	3.29	0.83
A8. Regional Competition	2.90	3.00	1.91	2.12	2.44	2.41	1.21	1.00	1.49
A9. Passengers' Safety	2.90	3.00	1.91	2.12	2.44	2.41	1.21	0.67	1.00
Total	10.85	11.48	9.90	14.89	22.16	13.77	13.39	15.64	5.82

After developing the norm matrix, the normalized matrix was developed as represented in the following weights. Values calculated in this matrix were used to calculate priority weights.

Table 18: Normalized Matrix for Social Sustainability Indicators

Com Priority	A1. Equal Oppor tunit ies	A2. Qua lity of Life	A3. Soci al Awa renes s	A4. Soc ial Just ice	A5. Cult ure Dive rsity	A6. Socia l Com mitm ent	A7. Social Engagem ent and Participat ion	A8. Regio nal Comp etition	A9. Passe ngers , Safet y
A1. Equal Opportun ities	0.09	0.20	0.16	0.09	0.12	0.05	0.17	0.10	0.06
A2. Quality of Life	0.04	0.09	0.17	0.22	0.17	0.17	0.13	0.15	0.06
A3. Social Awarenes s	0.06	0.05	0.10	0.25	0.21	0.11	0.13	0.12	0.09
A4. Social Justice	0.07	0.03	0.03	0.07	0.14	0.14	0.11	0.08	0.08
A5. Culture Diversity	0.03	0.02	0.02	0.02	0.05	0.06	0.10	0.09	0.07
A6. Social Commit ment	0.13	0.04	0.07	0.03	0.05	0.07	0.10	0.15	0.07
A7. Social Engagem ent and Participat ion	0.04	0.05	0.06	0.04	0.03	0.05	0.07	0.21	0.14
A8. Regional Competiti on	0.27	0.26	0.19	0.14	0.11	0.18	0.09	0.06	0.26

A9. Passengers' Safety	0.27	0.26	0.19	0.14	0.11	0.18	0.09	0.04	0.17
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A total of 15 aviation industry stakeholders participated in the current research to carry out the pairwise comparison of the sub-indicators of social sustainability. In addition, the stakeholders considered regional competition the most essential practice required for social sustainability, which had 17% importance. Passengers' safety followed the regional competition, the second most crucial aspect to ensure social sustainability with importance of 16%. In addition, quality of life was at third rank, which had 13% importance. Quality of life was followed by equal opportunities and social awareness with importance of 12%. Social justice, social commitment, and social engagement and participation had equal importance of 8%. The least important of 5% was given to cultural diversity.

Table 19: Priority Weights and Ranks for Social Sustainability Indicators

Social Sustainability Indicators	Priority Weights	Rank
A8. Regional Competition	0.17	1
A9. Passengers' Safety	0.16	2
A2. Quality of Life	0.13	3
A1. Equal Opportunities	0.12	4
A3. Social Awareness	0.12	4
A6. Social Commitment	0.08	5
A7. Social Engagement and Participation	0.08	5
A4. Social Justice	0.08	5
A5. Culture Diversity	0.05	6

Table 20: Eigen Values for Social Sustainability Indicators

	A1. Equal Oppor tunit ies	A2. Qua lity of Life	A3. Soci al Awa rene ss	A4. Soci al Just ice	A5. Cult ure Dive rsity	A6. Socia l Com mitm ent	A7. Social Engagem ent and Participat ion	A8. Regio nal Comp etition	A9. Passe ngers , Safet y	T o t a l
Ei ge n Va lue	1.02	1.11	1.15	1.19	1.12	1.07	0.95	1.59	0.89	10.1

Furthermore, the consistency ratio was calculated to ensure that all the judgments were accepted and valid.

$$CI = \frac{\text{Eigen Values} - n}{n - 1}$$

$$CI = \frac{10.1 - 9}{8}$$

$$CR = CI / RI$$

$$CR = 0.14/1.45$$

$$CR = 0.09$$

$$CR = 9\% < 10\%$$

As the value of CR is less than 10%, all the judgments were accepted.

4.3.3 Economic Sustainability

There were nine sub-indicators to evaluate economic sustainability. Fifteen stakeholders performed a pairwise comparison, presented in the appendix. Following the pairwise comparison, the norm matrix for economic sustainability indicators was evaluated as presented in the following table.

Table 21: Norm Matrix for Economic Sustainability Indicators

Com Priority	B1. Finan cial Kno wledg e shari ng	B2. Big Dat a Man age men t	B3. Eco no mic Gr owt h	B4. Fina ncia l Co mpli ance	B5. Trans parent Finan cial Repor ting	B6. Eco nom ic Dev elop men t	B7. Con sum er Exp endi ture	B8. Usage of renew able Energy/ Fuel	B9. Perform ing Cost Benefit- Analysis for Projects
B1. Financia l Knowle dge sharing	1.00	0.97	0.79	2.40	1.23	0.52	0.69	1.49	1.24
B2. Big Data Manage ment	1.03	1.00	2.31	4.58	3.99	2.29	2.04	3.58	3.83
B3. Economi c Growth	1.26	0.43	1.00	3.69	3.85	1.74	0.82	4.60	3.12
B4. Financia l Complia nce	0.42	0.22	0.27	1.00	1.16	0.61	0.88	1.39	1.07
B5. Transpa rent Financia l	0.81	0.25	0.26	0.86	1.00	0.87	0.73	2.85	1.43

Reporti ng									
B6. Economi c Develop ment	1.91	0.44	0.5 8	1.65	1.16	1.00	2.24	2.29	4.22
B7. Consum er Expendi ture	1.45	0.49	1.2 2	1.14	1.37	0.45	1.00	4.19	3.84
B8. Usage of renewab le Energy/ Fuel	0.81	0.26	0.3 2	0.93	0.70	0.24	0.26	1.00	1.18
B9. Perform ing Cost Benefit- Analysis for Projects	0.81	0.26	0.3 2	0.93	0.70	0.24	0.26	0.84	1.00
Total	9.50	4.32	7.0 7	17.1 9	15.16	7.94	8.91	22.23	20.93

After developing the norm matrix, the normalized matrix was developed as represented in the following weights. Values calculated in this matrix were used to calculate priority weights.

Table 22: Norm Matrix for Economic Sustainability Indicators

	B1.	B2.	B3.	B4.	B5.	B6.	B7.	B8.	B9.
Com Priority	Finan cial Kno	Big Dat a	Eco no mic	Fina ncia l	Trans parent Finan	Eco nom ic	Con sum er	Usage of renew	Perform ing Cost Benefit-

	wledg e shari ng	Man age men t	Gr owt h	Co mpli ance	cial Repor ting	Dev elop men t	Exp endi ture	able Ener gy/Fuel	Analysis for Projects
B1. Financia l Knowle dge sharing	0.11	0.22	0.1 1	0.14	0.08	0.07	0.08	0.07	0.06
B2. Big Data Manage ment	0.11	0.23	0.3 3	0.27	0.26	0.29	0.23	0.16	0.18
B3. Economi c Growth	0.13	0.10	0.1 4	0.21	0.25	0.22	0.09	0.21	0.15
B4. Financia	0.04	0.05	0.0 4	0.06	0.08	0.08	0.10	0.06	0.05

I Compliance									
B5. Transparent Financial Reporting	0.09	0.06	0.04	0.05	0.07	0.11	0.08	0.13	0.07
B6. Economic Development	0.20	0.10	0.08	0.10	0.08	0.13	0.25	0.10	0.20
B7. Consumer Expenditure	0.15	0.11	0.17	0.07	0.09	0.06	0.11	0.19	0.18

B8. Usage of renewab le Energy/ Fuel	0.08	0.06	0.0 5	0.05	0.05	0.03	0.03	0.04	0.06
B9. Perform ing Cost Benefit- Analysis for Projects	0.08	0.06	0.0 5	0.05	0.05	0.03	0.03	0.04	0.05

A total of 15 aviation industry stakeholders participated in the current research to carry out the pairwise comparison of the sub-indicators of economic sustainability. In addition, the stakeholders considered extensive data management the most essential practice required for economic sustainability, with 23 % importance. Comprehensive data management was followed by economic growth, the second most crucial aspect to ensure economic sustainability with an importance of 17 %. In addition, economic development was at third rank, which had 14 % importance. Economic growth was followed by consumer expenditure with an importance of 13 %, financial knowledge

sharing with importance of 10 %, transparent financial reporting with an importance of 8%, and financial compliance with an importance of 6 %. Additionally, the least essential indicator was renewable energy/fuel usage and cost-benefit analysis for projects with only 5 % importance.

Table 23: Priority Weights and Ranks for Economic Sustainability Indicators

Economic Sustainability Indicators	Priority Weights	Rank
B2. Big Data Management	0.23	1
B3. Economic Growth	0.17	2
B6. Economic Development	0.14	3
B7. Consumer Expenditure	0.13	4
B1. Financial Knowledge sharing	0.10	5
B5. Transparent Financial Reporting	0.08	6
B4. Financial Compliance	0.06	7
B8. Usage of renewable Energy/Fuel	0.05	8
B9. Performing Cost Benefit-Analysis for Projects	0.05	8

Table 24: Eigen Values for Economic Sustainability Indicators

	B1. Financial Knowledge sharing	B2. Big Data Management	B3. Economic Growth	B4. Financial Compliance	B5. Transparent Financial Reporting	B6. Economic Development	B7. Consumer Expenditure	B8. Usage of renewable Energy/Fuel	B9. Performing Cost Benefit-Analysis for Projects	Total
Eigen Value	0.98	0.99	1.19	1.06	1.15	1.09	1.13	1.12	1.01	9.72

Furthermore, the consistency ratio was calculated to ensure that all the judgments were accepted and valid.

$$CI = \frac{\text{Eigen Values} - n}{n - 1}$$

$$CI = \frac{9.72 - 9}{8}$$

$$CR = CI / RI$$

$$CR = 0.09/1.4$$

$$CR = 0.006$$

$$CR = 0.6 \% < 10\%$$

As the value of CR is less than 10 %, all the judgments were accepted.

4.3.4 Environmental Sustainability

There were five sub-indicators to evaluate environmental sustainability. Fifteen stakeholders performed a pairwise comparison, presented in the appendix. Following the pairwise comparison, the norm matrix for environmental sustainability indicators was evaluated as presented in the following table.

Table 25: Norm Matrix for Environmental Sustainability Indicators

	C1. Environmental Awareness	C2. Waste Reduction	C3. Noise Reduction	C4. Air Quality	C5. Compliance with the ICAO program for Sustainable Aviation
Com Priority					
C1. Environmental Awareness	1.00	3.07	2.38	1.39	2.21
C2. Waste Reduction	0.33	1.00	3.98	1.16	3.43
C3. Noise Reduction	0.42	0.25	1.00	0.37	1.57

C4. Air Quality	0.72	0.87	2.69	1.00	5.20
C5. Compliance with the ICAO program for Sustainable Aviation	0.45	0.29	0.64	0.19	1.00
Total	2.92	5.48	10.68	4.11	13.41

After developing the norm matrix, a normalized matrix was developed as represented in the following weights. Values calculated in this matrix were used to calculate priority weights.

Table 26: Normalized Matrix for Environmental Sustainability Indicators

Com Priority	C1. Environmental Awareness	C2. Waste Reduction	C3. Noise Reduction	C4. Air Quality	C5. Compliance with the ICAO program for Sustainable Aviation
C1. Environmental Awareness	0.34	0.56	0.22	0.34	0.16
C2. Waste Reduction	0.11	0.18	0.37	0.28	0.26
C3. Noise Reduction	0.14	0.05	0.09	0.09	0.12
C4. Air Quality	0.25	0.16	0.25	0.24	0.39
C5. Compliance with the ICAO program for Sustainable Aviation	0.16	0.05	0.06	0.05	0.07

A total of 15 aviation industry stakeholders participated in the current research to carry out the pairwise comparison of the sub-indicators of environmental sustainability. In addition, the stakeholders considered environmental awareness the most critical practice required for environmental sustainability, and it had 33% importance. Environmental awareness was followed by air quality, the second most crucial aspect to ensure environmental sustainability, with an importance of 26%. In addition, the waste reduction was in the third rank, with 24% importance. Waste reduction was followed by noise reduction with importance of 10%, and the least important of 8% was given to compliance with the ICAO program for sustainable aviation.

Table 27: Priority Weights and Ranks for Environmental Sustainability Indicators

Environmental Sustainability Indicators	Priority Weights	Rank
C1. Environmental Awareness	0.33	1
C4. Air Quality	0.26	2
C2. Waste Reduction	0.24	3
C3. Noise Reduction	0.10	4
C5. Compliance with the ICAO program for Sustainable Aviation	0.08	5

Table 28: Eigen Values for Economic Sustainability Indicators

	C1. Environmental Awareness	C2. Waste Reduction	C3. Noise Reduction	C4. Air Quality	C5. Compliance with the ICAO program for Sustainable Aviation	
Eigen Value	0.95	1.32	1.05	1.06	1.04	<u><u><u>5</u></u></u> : <u><u>4</u></u> <u><u>2</u></u>

Furthermore, the consistency ratio was calculated to ensure that all the judgments were accepted and valid.

$$CI = \frac{\text{Eigen Values} - n}{n - 1}$$

$$CI = \frac{5.42 - 5}{4}$$

$$CR = CI / RI$$

$$CR = 0.11/1.35$$

$$CR = 0.07$$

$$CR = 7\% < 10\%$$

As the value of CR is less than 10 %, all the judgments were accepted.

5 Chapter 5: Discussion

5.1 Key Stakeholders and Key Indicators

The primary stakeholders identified were passengers, civil aviation authorities, Airline companies, and Airport management companies. These stakeholders helped the researcher in identifying the critical sub-indicators of the primary sustainability indicators. Also, according to Change et al. (2017), the stakeholder theory allows companies or industries to act as actors in the social environment, and they should deal with stakeholder demands and pressures to attain their goals. Similarly, in the current research, stakeholder theory helped identify and evaluate the stakeholders, which could help the researcher understand their viewpoints in a dynamic environment and context, Dubai's civil aviation sector. The first research question was answered using qualitative analysis.

The following indicators and sub-indicators are mentioned for the reader's reference.

The key indicators of social sustainability were equal opportunities, quality of life, social awareness, social justice, cultural diversity, social commitment, social engagement and participation, regional competition, and passengers' safety. The key indicators of economic sustainability were financial knowledge sharing, extensive data management, economic growth, financial compliance, transparent financial reporting, economic development, consumer expenditure, renewable energy/fuel usage, and project cost-benefit analysis. The critical environmental sustainability indicators were environmental awareness, waste reduction, noise reduction, air quality, and compliance with the ICAO program for sustainable aviation. The second research question was

answered using qualitative analysis and critical exploratory research. Discussion of these indicators and sub-indicators is carried out in the following sections. Also, sustainability is one of the aspects understood and supported with the help of sustainability theory. Sustainability theory allows us to relate sustainability with various aspects, such as social, environmental, and economic sustainability, which are further discussed in the following sections.

5.2 Social Sustainability

Social sustainability has gained pace globally in recent years as significant concerns have been expressed for social problems that demand to make small and large private businesses accountable and various other participants. Social sustainability may also be seen as a humane standard of ethics that must be adhered to in an equal, accessible, and wise way. Social sustainability aims to integrate personal and social factors into the business or any sector in various ways, such as the safety of employees and consumers, satisfaction, well-being, ethical practices, and many others. It also entails safeguarding individuals from the adverse consequences of aviation operations that endanger their security, wellness, and satisfaction. Hutchins and Sutherland (2008) established various social criteria and indicators for measuring social aspects in their research, including healthcare, safety, compassion, and equality.

One of the important elements of social sustainability in the aviation sector identified in the current study is the incorporation of various social problems. Socially accountable business actions depend entirely on variables such as skilled strategy innovators who implement new regulations with a passion for increasing health and wellbeing and the workplace strategy in which choices are made. In the current

study, stakeholders developed social sustainability indicators indicating a necessity for fair and equal treatment and growth in the civil aviation industry. Numerous stakeholder organizations indicate that their future aspirations for air transport include fairness. Researchers such as Hutchins and Sutherland (2008) and Gray and Milne (2002) voiced particular worry about the aviation industry's expansion for all stakeholders in terms of employee and passenger treatment, which are in line with the current study's results. In this regard, some of the sub-indicators of social sustainability, such as fair treatment, social and economic justice, regional equality, workers' rights, and civil rights guarantee, are found in the current study, which is consistent with the results of Dhahri and Omri (2018).

Additionally, social indicators showed the importance of attaining extra advantages that guarantee societies' general health, consistent with Dhahri and Omri's results (2018). Results of the current study highlighted that life quality, community growth, corporate social responsibility, instructional initiatives, employment possibilities, social obligation, and social benefits are other markers of social sustainability, which are also identified in the literature (Gray & Milne, 2002). Several of these indicators are geared toward ensuring the safety and betterment of those who engage directly with the civil aviation sector, including traveller satisfaction, worker safety, customer satisfaction, and ensuring passenger rights, all of which align with Gray and Milne's findings (2002).

Our analysis in section 4.2.2.1 showed that some primary social indicators were significant in highlighting the role of social sustainability, such as quality of life, equal

opportunity, social awareness, culture diversity, social commitment, social engagement & participation, regional competition and passengers' safety.

A significant social indicator is the quality of life of passengers and employees. The results in sections 4.2.2.1 and 4.3.2 identified that quality of life could be considered as how passengers and employees feel regarding their health, safety, comfort, and satisfaction while travelling or working in the aviation industry. A similar result is presented by ACI (2019), in which the author mentions that the passengers also anticipate a high standard of living when they profit from the social advantages produced by civil aviation, which include a secure link between companies and customers and an enhanced standard of living for citizens). Additionally, the results of the current study outlined that it is essential to consider workers' quality of life since they work very hard in the aviation industry at all times. Similar to our study's findings, Lorincova et al. (2019) state that the quality of workers' performance and commitment affect the efficiency of customers' services and security, two of the most important factors for travellers in the civil aviation industry. From this point of view, an aviation company's primary responsibility is ensuring that its employees' critical demands and requirements are met, encouraging them, and assisting in their professional growth (Lorincova et al., 2019). It is essential to evaluate their requirements and identify the function of sustainable growth in this context to provide a good standard of living for aviation industry workers and customers.

Our findings show that one important factor is providing fair treatment to aviation sector competitors. According to the study by Chatzopoulou (2015), workers must be provided equal chances to work successfully and increase their output. The results

presented in section 4.2.2.1 of the current study outline that equal treatment is essential for the effective functioning of the workplace. Concerning this, Chatzopoulou (2015) identified the preceding sign of some crucial aspects, such as equitable, fair, and efficient treatment at the workplace, a good standard of pay, an attractive job, an honest evaluation of workers' growth, successful competency improvement, and comfortable and secure workplace culture. Additionally, the sub-indicators identified in the current study are in line with the study conducted by Penni (2019), in which the author emphasized the importance of professional advancement, explicit knowledge of the firm's vision and goal, chances for work balance, and job stability. Our results are also aligned with the findings of Lorincova et al. (2019), whereby the authors have also focused on establishing the critical importance of the working environment, whereby the mentioning some crucial aspects, such as basic pay, a robust workgroup, a fair review process, and a manager's attitude. Also, Dimitriou and Sartzetaki (2020) have mentioned factors such as inequality in terms of gender, income, well-being, treatment, and many others. In general, the study of the variables that lead to employee advancement and the creation of values in the civil aviation industry demonstrates that sustainable growth should be seen as a critical goal for employees, as it may lead to a rise in their work engagement and satisfaction.

The next indicator identified in section 4.2.2.1 through analysis in the current study was social awareness. It was found in the current study that social sustainability also enables passengers to acquire a sense of social responsibility through expanding possibilities in the aviation sector, accelerating expansion and progress, and influencing passenger attitudes and understanding, which is in line with the results of Machnik-Somka (2017). For example, Richards and Barry (2010) emphasize that social

awareness is being conscious of others' emotions, demands, and worries, which includes being sympathetic, becoming aware of a firm's interconnections, and being mindful of others' requirements. Additionally, the results of the current study confirm what the authors state and how critical it is for decision-makers in the aviation industry to be socially aware. This is because when individuals acknowledge their strong and weak points, create a healthy identity, sustain credibility, illustrate adaptability, accept accountability for their own behaviour, take charge, and pursue excellence, stakeholders can enhance their effectiveness. The results of the current study also reflect the findings of Lee and Mo (2011). The author mentions that the aviation industry's conduct regarding carbon emissions, ineffective energy efficiency, and poor air quality, among other difficulties, must be made socially aware to the general public. In general, it can be observed that social awareness is one of the significant contributors to social sustainability in the civil aviation sector because it helps achieve employees' satisfaction with customer awareness and benefit other stakeholders.

The next indicator identified in section 4.2.2.1 through analysis in the current study was cultural diversity. Cultural diversity is the diverse existence of individuals based on their ethnicity, culture, language, and other cultural aspects. In this respect, Leamon et al. (2019) state that stakeholders indicate worries about the civil aviation sector's sustainability, which has increased stakeholders' stress on the sector's sustainability in the form of sociocultural pressures. Similarly, the results of the current study confirm what Chodhry (2018) notes, and it is about how workers in the civil aviation industry face various cultural challenges. The results of the current study reflected that the stakeholders' contact with coworkers from around the world, respective signing managerial authority, and their schooling in western nations are all

features related to cultural diversity. The results of the current study also reflect the findings of Chodhry (2018), whereby the author mentions how effective interaction and collaboration are critical for security and ensuring social sustainability. People from diverse cultural backgrounds have challenges; however, the findings of the current study outline that these issues should not be handled openly and that individuals should not be publicly chastised. In general, it can be observed that cultural diversity is one of the significant contributors to social sustainability in the civil aviation sector because it allows the stakeholders to help employees not to engage in cultural diversity internally within the organization and with consumers. All employees and passengers should be treated similarly, irrespective of their culture.

The next indicator identified in section 4.2.2.1 through analysis in the current study was social commitment. Social commitment allows all the stakeholders to be socially committed to social standards, environmental regulations, and other aspects. Stakeholders should be socially responsible while carrying out all the activities in the aviation sector. The findings of the current study support the conclusions of Kuo et al (2016) research's that socially responsible and committed aviation industry stakeholders can improve the competitive advantage of their organization, increase passenger loyalty and satisfaction, and be committed to maintaining the organizational and environmental climate. Numerous airlines are dedicated to doing operations honestly, according to local regulations, adopting excellent business procedures whenever possible, and comparing themselves with standard operating procedures (Kuo et al., 2016).

Additionally, the current study indicated that being socially accountable to the airline firm or sector as a whole enables stakeholders to dedicate themselves to

maintaining the firm's credibility and brand value, increasing stakeholder sociocultural and environmental consciousness, interaction with interested parties, control systems, organizational culture, share price, and public accountability. Being socially conscious can be seen as one of the most essential components of social sustainability because it aids in achieving a significant competitive advantage, boosting brand recognition, raising customer satisfaction levels, and helping to resolve legal and environmental difficulties. One of the other indicators that are similar to social commitment is social engagement and participation.

Social engagement and participation can also help increase social commitment, and the opposite is possible. Ilkhanizadeh and Karatepe (2017) have mentioned that engaged stakeholders help achieve high customer satisfaction and enhance their behaviour. Employees operate in a social context that provides signals about employee attitudes and needs and acceptable justifications for behaviour. The present study's findings demonstrate that airline enterprises in Dubai are now more conscious of the value of training, worker safeguards, employment conditions, and their company's financial responsibilities to avoid problems with ethical and legal standards. Stakeholders must actively and socially overcome prior worries (Kuo et al., 2016). The results of the current study outline that stakeholders are interested in seeing it succeed in keeping the organization operating at a high level of efficiency and environmental responsibility. One of the most important things a company can do to ensure long-term success is to engage with this group of stakeholders. Companies may face various challenges when engaging stakeholder groups for social sustainability growth, including factors like lack of a cohesive strategy of stakeholders' involvement, improprieties, inadequate capacity, an excessive amount of various stakeholders,

terminal phase of stakeholders' involvement, stakeholder exhaustion and defeatism, risks for authorities and legal authorities (Filho & Brandli, 2016). As mentioned earlier, effective mechanisms for preventing the problems are needed to ensure stakeholders' successful social involvement in sustainable development.

The next indicator identified in section 4.2.2.1 through analysis in the current study was regional competitiveness. The results of the present study indicate that non-governmental organizations (NGOs), which the researchers also describe, stress, market pressure, consumer requirements, market pressure, competitive pricing pressure, employee and shareholder pressure, and legislative burden are the most effective ways that stakeholders can influence the process of social sustainability advancements Awan et al. (2017). Stakeholders' significant impact on the practice of social sustainability development inside businesses is due to their actual impact on their decision-making processes. Additionally, all local airlines operate under a unified organizational framework. As part of a competent strategy group, they may even be deemed to work based on one or more strategic criteria that are consistent. A greater variety of institutions and destinations may be found in the international airline industry, where most airlines operate. Numerous nations have official cigarette-carrying airlines, which are often government-owned. The regional rivalry may have a significant negative and positive effect on the civil aviation industry's social sustainability.

The current study highlighted passenger safety as the following indicator of social sustainability. The findings from section 4.3.2 represent that passenger safety is critical for all aviation stakeholders. The current study's findings confirm those of Thaichon et

al. (2016). The authors show that focusing on passengers' demands may result in their paying a more excellent price for the level of offerings that meet their requirements. It was also shown that improved airline safety and customer satisfaction might affect travellers' decisions. The quality of passengers' services and safety are two of the most significant elements for travellers in civil aviation because of workers' performance and devotion. Various technological, logistical, environmental, and financial variables influence security and safety in air transport. As a result, aviation businesses must prioritize safety and security to overcome obstacles (Deepa & Jayaraman, 2017).

Additionally, Kuo et al. (2016) note that security and cost are significant variables affecting flight selection among young passengers. Continuously increasing aviation safety is the aviation sector's top goal. An airline's safety record is critical to its business, as mentioned in Deepa and Jayaraman (2017) and as outlined in the current study results. Safety is trust in a system's ability to provide operations properly from start to finish, and as such, it is a critical indicator for promoting and attaining social sustainability.

It is important to outline which of the indicators were unique indicators and the indicators that have been discussed before in the context of the aviation sector.

Sub-Indicators of Social Sustainability	Characterization (Global or Unique)
A1. Equal Opportunities	Global
A2. Quality of Life	Global
A3. Social Awareness	Global
A4. Social Justice	Global
A5. Culture Diversity	Global

A6. Social Commitment	Unique
A7. Social Engagement and Participation	Global
A8. Regional Competition	Unique
A9. Passengers' Safety	Global

It can be observed from the above discussion that the third research question is answered and explored. Also, it was observed that social sustainability is essential for stakeholders to achieve in the civil aviation sector. The analysis also observed three top priority indicators: regional competition, passenger safety, and stakeholders' quality of life, like employees and passengers.

5.3 Economic Sustainability

Economic sustainability is a primary concern for the majority of stakeholders. Increasing a company's financial sustainability results in immediate advantages for its primary stakeholders, including lower passenger fares, increased employee remuneration, increased investor profits, and reduced government tax obligations. Stakeholder involvement in developing economic sustainability in transparent and sustainable corporate activity is challenging to measure objectively. A company's competitiveness may also be based on effective stakeholder participation. Successful stakeholder involvement from an economic sustainability viewpoint provides several benefits, including regular dialogue and refinement with partners and a more strategic company approach to predicting and reacting to current economic issues. The results of the current study align with the research of Whelan and Funk (2016), whereby the authors mention that in the absence of efficient collaboration among stakeholders and a business, disputes may arise, reducing the economic efficiency of its operations.

Additionally, good collaboration with stakeholders may impact the number of obstacles an organization faces in its business activities (Whelan & Fink, 2016). The current study has also focused on the consumers in general, which are passengers. It can be observed in the analysis that passengers increasingly, in particular, demand the most excellent quality of goods and services, and the firm's goal is to achieve sustainable outcomes and provide complete data to clients to influence their choices in favour of the organization's offerings. Businesses may raise their pricing depending on consumers' willingness to pay more for higher quality via sustainable growth processes.

Additionally, effective collaboration with workers may improve their efficiency and overall quality results for the business. The results of the current study confirm that the innovation process entails altering any component of a company model, instead of the entire marketing strategy, via the administration of volunteering efforts that seek to benefit all parties, which is in line with the research conducted by Rotondo et al. (2019). Additionally, the author notes that economic sustainability may be accomplished by concentrating on three factors: framework, pricing structure, and marketplace. Forsyth (2011) emphasizes that economic stability differs from environmental sustainability, even though both terms are used interchangeably. Economic stability refers to an entity's capacity to generate earnings in the long term, capable of keeping it in operation, such as a company. From the results of the current study, an understanding of economic sustainability is about managing it for the long run, and it must have profits that are at least as high as or higher than its expenses. As long as the corporation can recover its losses in the future, it can bear the loss for a lengthy period in the near run. If that's not the situation, the business will fail to be economically beneficial (Forsyth, 2011).

Additionally, financial sustainability necessitates the business getting credit to finance its operations and investments. Regarding market circumstances, the most prevalent market configuration for aviation is an oligopoly. It might seem that firms operating in this environment will have difficulties carrying on as the cost increases. If airline companies operating in oligopoly circumstances can retain sustainability in the long term even if they do not reach more than average profits. Additionally, airlines have had to deal with rapidly increasing and occasionally rising fuel costs at various times. The recent crisis of the COVID-19 pandemic had a significant impact on the economic sustainability of the airline industry. Some key indicators of economic sustainability were found through thematic analysis, including knowledge sharing, extensive data management, compliance with reporting requirements for economic growth, economic development, consumer spending, renewable fuel or energy use, and undertaking cost-benefit analyses for projects.

The results presented in section 4.2.2.2 of the current study outline that knowledge sharing is one of the significant indicators of economic sustainability. Efficient knowledge sharing about consumers may be seen as the bedrock of consumer value generation in cooperative partnerships between expert service companies and their clients (Natti & Still, 2007). The findings of this study provide an explanation for Fan and Ku's (2009) findings, which emphasize the significance of knowledge sharing among airline companies and transportation organizations in facilitating the effective development, communication, and utilization of knowledge through these collaborative efforts and that it is a prerequisite for cooperation and its associated knowledge management to become more customer-centric. Teamwork must demonstrate an in-depth understanding of markets, consumers, goods and solutions, techniques and

procedures, rivals, personnel capabilities, and the legal frameworks around information technology. Enhanced knowledge sharing has resulted in business advantages such as better productivity, increased customer engagement, strategic growth and development, more flexible market adaptation, an enhanced decision-making process, and more fast and flexible procedures (Warkentin et al., 2001). Also, the findings of our study agreed with Yuan et al. (2016), as the authors talked about the significance of technological advances and how they have enabled information exchange. Online reservation groups have developed into a public means of information exchange, creating new possibilities for individuals and tourism industry groups. Knowledge sharing can increase the sharing of information between stakeholders, allowing them to improve the quality of services and customer satisfaction, which leads to economical sustainability.

The results presented in section 4.2.2.2 of the current study outline that big data management is one of the significant indicators of economic sustainability. Big data is one of the most innovative technologies from industry 4.0 technologies. The aviation sector collects a considerable amount of data every second, which needs to be analyzed using the right analytics approaches. Concerning this, According to Wixom et al. (2008), airline companies have made significant investments in data collection and handling and increasingly in business analytics technologies to provide extra commercial value. Nevertheless, not all aviation operations benefitted equally from these improvements. The results of the current study are in contrast to the findings of Hausladen and Schosser (2020), whereby the authors mention that the management of costs and revenues has benefitted the most from advanced analytics initiatives, flying operational activities, routing financial analysis, and management of consumers and their relations.

Information suppliers and software designers also value developing technical facilities for extensive data management and analytics in system modelling and network planning. The operations for network planning are responsible for designing and developing a beneficial big data environment that meets the particular requirements of the airline (Heilig and Vob, 2017). The researchers in the field of extensive data management in the aviation sector support the results of the current study, as advanced analytics and monitoring are critical for the aviation industry to achieve economic benefits (Holland et al., 2020). Additionally, the authors note that aviation businesses may be capable of describing their competitive situation from customers' viewpoint, gaining new insights into the industry, especially regarding fundamental data unavailable with an application server. Data analytics has apparent uses in aviation, including segmenting, advertising, competition analysis, and relationship assessment with other airline companies. Using big data in web data sets opens up new statistical avenues for analyzing online productivity and competitive assessment in an economic climate. All of these factors contribute significantly to economic sustainability.

The results presented in section 4.2.2.2 of the current study outline two significant indicators of economic sustainability: economic growth compliance and economic development. These two indicators are two of the highest priority economic sustainability indicators in the analysis of the current study. The results of the current study resemble the important aspect outlined by Baltaci et al. (2015), in which the author mentions that market growth contributes to the nation's continuous and sustainable economic growth and may affect macroeconomics factors (Baltaci et al., 2015). The authors further mention that airline transportation affects the business through generating many social advantages in localized markets due to its unique

characteristics like efficiency, affordability, convenience, and safety, as well as by offering job possibilities in the airline business. If the area is economically active, it generates money and meets the transport requirements of passengers and goods, which generate demand for aircraft transport systems. Similar to the results of the current study and other researchers, it can be understood that commercial air transport expenditures may have a dual impact on the area's economy. The airport will generate extra revenue for the local economy by generating new and immediate payments to develop new jobs and structures.

Additionally, secondary and stimulated spending associated with large-scale continuous infrastructure expenditures will help the local economy by providing diverse investments and foreign labour possibilities. Second, aviation systems may alter a region's trade relations with other areas and nations. As a result, effectively expanding airline connections or linkages are anticipated to provide a strategic advantage over other areas with access challenges. Dharmawan's (2012) study also indicated a positive correlation between aviation transportation and economic development. The findings from the analysis and literature support that a country's economic growth and development can significantly impact the aviation industry, which can, in return, develop economic sustainability in the aviation sector.

The results presented in section 4.2.2.2 of the current study outline that two significant indicators of economic sustainability are transparent reporting. Transparent reporting is crucial for airline companies to ensure that market benefits and increase their competitive advantage. Suppose the customers know that the airlines are engaged in unethical activities or report incorrect information in their annual reports. In that case,

it can significantly impact their economic value, leading to poor economic sustainability. The results of the current study confirm what Dube and Nhamo (2019) have noted, which outlines that just some airline companies are open about their energy consumption and emission policies, with the majority of low-cost carriers functioning in the industry. Reducing emissions seems to be a secondary concern for most airlines, with a few declining to submit required yearly annual documents owing to profitability and governance issues (Dube & Nhamo, 2019). Similar to this, Stevenson and Marintseva (2019) note that integrity problems can arise in the airline industry as a result of airline firms' failure to make further efforts to reveal details about their initiatives, auditing concerns, impact analysis, and money usage. It can be observed that transparent reporting is one of the crucial indicators of economic sustainability because it would help airline companies in gaining customer support, which would increase their competitive advantage.

The results presented in section 4.2.2.2 of the current study outline that consumer expenditure is two of the significant economic sustainability indicators. Every year, consumer expenditure is determined by demographics, employment, economic output, economic conditions, and net revenue (Yoon & Jeong, 2016). Exogenous factors include the demographic and the foreign conversion value, calculated based on historical data patterns. Additionally, customers of airline services often have concerns about the airline's safety and dependability, the timeliness of aircraft, the efficiency and security of baggage handling services, and the efficiency of baggage transit (Jeng, 2016). The viability of aviation businesses is primarily determined by customer purchasing intent. As the aviation business grows more competitive, many airlines compete on pricing or regular traveller schemes, yet customers perceive the little

distinction between airlines (Jeng, 2016). From a practical standpoint, airline businesses should distinguish themselves through pricing competition, regular flyer schemes, and developing initiatives to bolster their competitiveness. The following discussion shows that airline companies can achieve economic sustainability if they take precautionary measures to analyse consumer expenditures.

The following indicators for economic sustainability from the analysis are renewable fuel or energy and cost-benefit analysis for projects. It is significant for airline companies to use renewable resources because it helps prevent carbon emissions that can lead to adverse environmental impacts. Alameeri et al. (2017) also mention that if these airline companies control these emissions, they can maintain economic sustainability. The cost-benefit analysis also enables the comparison of such unmeasurable variables. The analysis also helps standardize all economic costs and advantages by revealing how much profit consumers are prepared to spend for the advantages such laws may provide. An agency may use this approach to quantify the worth of wellness and evaluate it against the financial worth of purchasing commodities. The cost-benefit analysis helps in achieving economic sustainability.

It is important to outline which of the indicators were unique indicators and the indicators that have been discussed before in the context of the aviation sector.

Sub-Indicators of Economic Sustainability	Characterization (Global or Unique)
B1. Financial Knowledge sharing	Global
B2. Big Data Management	Global
B3. Economic Growth	Global

B4. Financial Compliance	Global
B5. Transparent Financial Reporting	Global
B6. Economic Development	Global
B7. Consumer Expenditure	Global
B8. Usage of renewable Energy/Fuel	Global
B9. Performing Cost Benefit-Analysis for Projects	Global

It can be observed from the above discussion that the third research question is answered and explored. Also, it is outlined that economic sustainability is vital for stakeholders to achieve in the civil aviation sector. The analysis also observed that three top priority indicators were extensive data management, economic growth, and economic development.

5.4 Environmental Sustainability

Environmental sustainability is a critical factor that the aviation industry must address to maintain a competitive edge and reduce its carbon footprint. Due to its use of carbon fuels, dangerous chemicals, and the employment of numerous diverse groups of employees, the aviation industry harms the environment and the welfare of the general public. It needs to be looked after. The development of the aviation sector, both in terms of passenger and freight transport, has worsened these challenges since rising demand results in greater energy consumption, hazardous waste, and pollution (Upham & Mills, 2005). Due to the international nature of the business, these unfavourable consequences spread beyond the nations of origin of the corporations, eventually culminating in global warming. Under pressure from essential stakeholders such as

governments, politicians, and consumers, firms worldwide have gradually changed their business processes to include environmentally friendly techniques that may be adopted for short and extended periods. By and large, businesses that practice environmentally sustainable business practices prioritize reducing emissions, minimizing and eliminating waste, conserving energy, integrating and implementing energy conservation strategies, and ensuring that goods are delivered in an environmentally friendly and sustainable manner (Van der Waladt, 2016). A similar observation made by Geissdoerfer et al. (2018), which was also observed in our study, is that environmentally sustainable practices can be initiated institutionally through adopting environmentally friendly company policies, procedures, and operating principles. They can also be compelled from the outside by regulatory authorities, government agencies, and other interested parties to reduce carbon emissions associated with businesses' operations (Geissdoerfer et al., 2018). Incorporating or involving stakeholders from several economic sectors, notably product development and manufacturing, has typically been a pillar of ecologically sustainable business strategy (Abdullah et al., 2016). Sustainability practices are progressively incorporated into company operations and policies in response to stakeholder demand from shareholders, workers, and government agencies. This has created a new environment where sustainability activities coexist with business competitiveness concerns.

Additionally, implementing environmentally friendly practices may aid firms in expanding into new markets, enhancing their image, and hiring top talent (Van der Waladt, 2016). Businesses may optimize the benefits of sustainable practices by implementing individual and organizational enhancements targeted at streamlining the

design process and promoting green aims. If airline enterprises can decrease environmental waste and save resources, they can increase their sustainability, boosting market competitiveness.

It can be observed that environmental sustainability is a rising concern for the aviation industry. From the thematic analysis conducted in the analysis section, some primary indicators of economic sustainability were environmental awareness, waste reduction, noise reduction, air quality, compliance with ICAO, and a program for sustainable aviation.

The significant sub-indicator in the analysis represented in section 4.2.2.3 is environmental awareness. The results of the current study focus on environmental awareness, which is in line with the results of Daley et al. (2016) and Addepali et al. (2018). For instance, pollution of air and noise and fuel usage reductions in terms of carbon emissions reduction would persist in being the main objective, which will be accomplished via the growth of industrial aircraft technology (Daley et al., 2016). Engine technology growth will be accelerated via the employment of novel components, cutting-edge aeronautical concepts, and improved fabrication techniques, all of which will be fueled by significant investment in technology and expansion by other scientific organizations. Specific innovations, such as improved aeroplane layouts that improve fuel economy, illustrate how losing weight may substantially decrease fuel usage, thus contributing to additional emission reductions (Addepalli et al., 2018). Much of this work has been done to improve the aircraft operating economy, directly impacting airline revenue. This also allows the sector to transition towards a better viable and sustainable state, where environmental effects are significantly reduced. The

environmental challenges and public knowledge of it are two factors that propel the sector forward, especially during growing demands (Addepalli et al., 2018). With the overall regulations, there is growing pressure on the industry to decrease pollutant concentrations, with a strong emphasis on achieving substantial reductions and meeting environmental goals. It can be observed that ecological awareness is one of the significant primary factors that leads to a high level of ecological sustainability. From the results of priority ranking also, it was observed that environmental awareness has the highest priority.

One of the significant sub-indicators identified in the analysis is represented in section 4.2.2.3 waste reduction. Waste generation is a rising concern for the aviation sector, which leads to poor environmental sustainability. Various types of waste are generated, and it is essential to reduce them to maintain the environmental sustainability. For instance, Wong et al. (2017) mention the waste generated by aircraft. Regarding this, the authors mention that the aircraft makers are bracing for a new generation of recycling difficulties because these aeroplanes include a much more significant proportion of carbon fibre polymer composites that can be reused or recycled using traditional recycling methods (Wong et al., 2017). The current study also shows that aircraft manufacturers have been working on recycling-related research and development. This will help reduce environmentally harmful wasteful disassembly and the legal risk associated with reusing recovered parts that have not been certified. However, Mehta (2015) describes additional waste the aviation industry generates. Some waste that needs to be reduced to maintain environmental sustainability is solid waste like packaging resources, construction or repairing destruction, wet waste like food wastage, and any other waste generated by airlines or airports. It is significant for

airline companies and the aviation industry to use innovative technologies and recycle such waste to maintain the environmental sustainability.

The next indicator identified for environmental sustainability from the analysis is noise reduction. In terms of noise impact, air transport agencies and environmental groups around the globe have all adopted increasingly stringent rules and criteria for aircraft, particularly civil aircraft. Numerous nations, including the United States and China, have noise mitigation restrictions in their airworthiness rules (Lin, 2013). It is critical to adhere to these standards and decrease noise pollution in three main areas: engine and turbine and structural noise control. Noise reduction may occur due to advanced technologies like aerodynamics acoustics, sound and circulation control methods, and noise control in turbines. Also, Kusumalestari et al. (2020) mention that cardiac illness, mental impairments, and other inconveniences have all been documented due to frequent exposure to environmental noise created by aeroplanes and the aviation sector. All people should be concerned about environmental noise, and it is critical to safeguard residents from even slight hearing impairment. Hence, the airline sector needs to focus on reducing noise, which would help maintain the environmental sustainability.

The next indicator identified for environmental sustainability from the analysis is air quality. Poor air quality is one of the significant concerns caused by the aviation industry (Yim et al., 2013). Aviation negatively impacts the atmosphere and environment, and climate change is worsened by aeroplane releases of greenhouse gases and their constituents worldwide. Regionally, aeroplane emissions affect air quality that, in response, affects the health of individuals. Poor air quality is linked to

early death, cardiac disease, respiratory hospitalizations, and asthmatic exacerbation. Locally, aeroplane sounds and noise pollution depreciate home capital and disrupt relaxation (Yim et al., 2013). It can be observed that poor air quality can negatively impact environmental sustainability. So, the aviation sector needs to reduce carbon emissions and greenhouse gases, enhancing air quality.

The next indicator identified for environmental sustainability from the analysis is compliance with ICAO and the development of a program for sustainable aviation. ICAO is the most significant regulatory authority that focuses on practices of the aviation industry and how to improve those to achieve better environmental sustainability (Mahoro, 2015). The airline companies must comply with ICAO regulations focusing on air and noise emissions. If these emissions are adequately controlled, then it would have a significant impact on environmental sustainability as well as on public health. When one airline suffers a disaster globally, it has a detrimental effect on the whole industry, mainly when deaths occur (Mahoro, 2015). Through constant agreement and discussion, the ICAO member nations have developed policies to foster a better aviation sector. Compliance with ICAO will benefit airline businesses by supporting the safety and efficient development of civil aviation worldwide and developing the technical disciplines of aircraft construction and optimization for legitimate objectives (Spence et al., 2015).

Additionally, the authors note that ICAO compliance can expand routes, terminals, and airworthiness infrastructure for global civil aviation and satisfy the world's population's need for secure, frequent, effective, and affordable air travel. Compliance with ICAO can benefit in increasing environmental sustainability,

avoiding financial wastage due to excessive rivalry and ensuring contractual countries' interests are adequately protected. That signatory parties all have an equal chance to establish foreign airlines.

Identifying the new signs and those that have already been examined concerning the aviation industry is crucial.

Sub-Indicators of Environmental Sustainability	Characterization (Global or Unique)
C1. Environmental Awareness	Global
C2. Waste Reduction	Global
C3. Noise Reduction	Global
C4. Air Quality	Global
C5. Compliance with the ICAO program for Sustainable Aviation	Global

It can be observed from the above discussion that environmental sustainability is essential for stakeholders to achieve in the civil aviation sector, and the fifth research question was answered. The analysis also observed three top priority indicators: environmental awareness, air quality, and waste reduction.

From the analysis of social, economic, and environmental sustainability indicators, it can be observed that all indicators would help the UAE's aviation sector become more sustainable and increase its competitive edge in the global aviation market. The UAE's aviation industry has to ensure that regional completion is maintained for social sustainability, extensive data management is implemented correctly to achieve high economic sustainability, and increase environmental awareness among all stakeholders to increase environmental sustainability.

5.5 Stakeholders' Engagement and Sustainable Development

Stakeholders' engagement reflects a business's capacity to collaborate with various stakeholders (Jeffery, 2009). It includes efforts or strategies developed by businesses to proactively involve their stakeholders in business activities (Fontaine, 2013). Their engagement also motivates and incentivizes significant improvements to fundamental business processes that benefit people and the environment (Upham & Mills, 2005). From a communication perspective, stakeholder engagement induces the recognition and participation of stakeholders and other social groups monitoring business operations (Geissdoerfer et al., 2018). Our results confirm the importance of stakeholder engagement and the associated communication benefits, as observed in the literature (Geissdoerfer et al., 2018). Our results show that stakeholders, who are actively involved in the aviation sector business, are far more willing to cooperate and promote business operations and plan, thereby enhancing the sector's business sustainability and development. In addition to recognising their important role, aviation sector businesses must maintain close relations with stakeholders and include them in critical business decisions regarding sustainability to ensure the long-term viability and success of these business plans, as documented by previous studies (Upham & Mills, 2005).

Also, it is essential for the firms, independently or as a part of the civil aviation sector, to ensure that they prioritise the stakeholders per the requirements, resource capacity, and other aspects of an organization. Also, the companies can perform stakeholder analysis, which would explain the critical stakeholders within the organization based on their power and interest. It would help determine high power and high-interest stakeholders, whose opinions can be considered for better decision-

making and improved organizational outcomes. The top-management executives can also determine whom to allocate resources to based on the context and situation. Also, detailed stakeholder management and engagement plan can be prepared to improve stakeholder requirements, build trust with them, and monitor, evaluate, and document them for better outcomes and performance.

Our results also showed that stakeholder engagement should be expanded to help the aviation sector meet its broader institutional goals and operational activities, complementing the role of shareholders and, more importantly, aiding the effectiveness of engagement methods. Active stakeholder engagement often aids the shareholders' efforts in developing the business's public reputation through a mutually reinforcing process. In this regard, our results imply that we should balance engaging stakeholders in some vital business sustainability decisions and retaining strategic and operational decision-making authority within the business. Stakeholder engagement is critical during periods of business distress caused by external shocks. For example, the Covid19 pandemic has created major viability issues for the aviation sector worldwide, directly impacting the sector's ability to achieve social, environmental, and economic sustainability. Under such adverse market conditions, stakeholders must be called to improve the sector's resilience to maintain sustainability. Their contribution to stability should extend to logistics, business risk management and project management.

6 Chapter 6: Conclusion, Limitations, and Future Recommendations

6.1 Research Summary

Our study conceptualizes and examines the importance of sustainability in the civil aviation sector of Dubai. It defines the critical categories of stakeholders engaged in the sustainability of the civil aviation sector in Dubai. Additionally, our study identifies the key metrics that gauge how stakeholders feel about sustainable development processes in Dubai's civil aviation sector, allowing us to determine the most productive means of stakeholder engagement and formulate suggestions for managing the sector's sustainable development. The focus of our study's interest is the civil aviation sector of Dubai because the city has invested heavily in the sector's development, achieved business success, and is striving to transform the sector into a long-term sustainable economic force. The aviation sector worldwide is one of the economic sectors with an adverse impact on sustainability. In addition, the recent pandemic crisis has posed additional operational challenges to the sector's viability. Hence, improving the sustainability in the civil aviation sector of Dubai is a core policy challenge, the meeting of which has inspired our study.

The analytical objectives of the study were achieved by adopting a mixed research method that comprises an exploratory approach, qualitative analysis and the use of an AHP framework. The exploratory approach was used to identify and examine the role of three key sustainability indicators, i.e., social sustainability, economic sustainability, and environmental sustainability. Social sustainability integrates personal and social considerations into the private business sector decision-making in various ways, such as the safety, satisfaction, and well-being of employees and consumers, and ethical

practices, among others. Economic sustainability integrates economic inclusion policies in business decisions with advantages for themselves and their key stakeholders, including lower passenger fares, increased employee remuneration, increased investor profits, and reduced government tax obligations. Finally, environmental sustainability focuses on transforming business operations to enhance the environment and reduce energy consumption, toxic wastage, and pollution. The study critically reviewed these sustainability indicators and developed an understanding of the influence of stakeholder engagement on increasing sustainable growth and development.

The qualitative research method was used to analyze the sustainability indicators and their context and used focus group information. Members of the civil aviation sector's middle and upper management, members of the airport and airline operator companies' stakeholder groups, and airport passengers made up the study's sample. A purposive sampling method was used to determine the sample size that included 148 participants from four important stakeholders: passengers, the Civil Aviation Authority, the Dubai Airport Company, and commercial airline executives. After analyzing the participants' responses, social, economic, and environmental sustainability sub-indicators were identified. Focused groups gathered the information through Microsoft Teams interactive sessions, which were documented for each group of stakeholders. The qualitative method identified the essential sustainability indicators in the civil aviation sector as well as the perspectives of relevant stakeholders. Subsequently, the study carried out a thematic analysis to identify critical sub-indicators. As expected, different stakeholders expressed different views on the importance of the other sustainability indicators. Passengers, for instance, highlighted the importance of higher

education, educational campaigns, embracing cultural diversity, community development, corporate social responsibility, ensuring passengers' rights, quality of life, equal opportunities, law and governance, and so forth when discussing social sustainability. The civil aviation authority emphasized the value of 21 sub-indicators of social sustainability, including equal opportunities, regional political ties, social commitment, social security, cultural diversity, social justice and equity, readiness and contingency plan, social loyalty, intergenerational equity, community trust, social awareness, aviation quality control, social happiness, labour rights, occupational health and safety, national noise level, and Emiratization.

Moreover, the airport operators emphasized the role of 24 sub-indicators of social sustainability, such as airport jobs opportunities, regional competition, intergenerational equity, social commitment, social security and trust, social coherence, social loyalty, readiness and contingency plans, passenger safety, cultures diversity, social engagement and participation, organizational change readiness, Emiratization, airport life quality, culture diversity, occupational health and safety, customer happiness, regional equity, dependency ratio, social justice, governance, social awareness, human assets and labour rights, social benefits and rewards. Finally, commercial airlines emphasized the role of 22 sub-indicators, such as aircrew health and safety, social awareness, contingency plans, social benefits, culture diversity, social commitment, emergency readiness, social engagement, flexibility, social justice, jobs opportunities, social loyalty, labour rights, social security and trust, organizational development, workforce participation, globalization, passengers safety, regional competition, passengers' satisfaction, and share of the UAE nationals. A similar approach was used to identify sub-indicators of economic and environmental

sustainability. After identifying the sub-indicators, the study used the AHP to prioritize and analyze the indicators to improve the civil aviation sector's decision-making process.

The data used for the AHP analysis was collected from 15 aviation sector stakeholders through a pairwise comparison matrix for each of the core indicators and their sub-indicators. The results indicated that economic sustainability was the highest priority indicator among the three sustainability indicators.

Our study documented that the key indicators of social sustainability were equal opportunities, quality of life, social awareness, social justice, cultural diversity, social commitment, social engagement and participation, regional competition, and passengers' safety.

Our study further documented that the key indicators of economic sustainability were financial knowledge sharing, extensive data management, economic growth, financial compliance, transparent financial reporting, economic development, consumer expenditure, renewable energy/fuel usage, and project cost-benefit analysis. Lowering passenger rates and increasing staff salaries are two immediate benefits of increasing a company's economic sustainability. A company's ability to overcome hurdles may be influenced by how well it collaborates with its stakeholders.

Finally, our study documented that the key indicators of environmental sustainability were environmental awareness, waste reduction, noise reduction, air quality, and compliance with the ICAO program for sustainable aviation.

Our study analyzed all these sub-indicators using the AHP model and found that three top priority indicators of social sustainability were regional competition, passenger safety, and stakeholders' quality of life, like employees and passengers. The three top indicators for economic sustainability were extensive data management, economic growth, and economic development. Finally, the three top environmental sustainability indicators were environmental awareness, air quality, and waste reduction.

Our analysis of the social, economic, and environmental sustainability indicators demonstrates that some indicators, more than others, would assist the UAE's aviation sector in becoming more sustainable in the long term and strengthening its competitive edge in the global aviation market. The aviation sector in the UAE must improve its regional competitiveness to achieve social sustainability, properly implement extensive data management to achieve economic sustainability, and increase environmental awareness among all stakeholders to achieve ecological sustainability.

Our study also showed that stakeholders are essential actors in the process of promoting sustainability. Stakeholders should be actively involved and engaged in a company to collaborate and encourage the sectors' activities and plans, which would help them improve its long-term viability and development. Businesses must maintain relationships with their stakeholders and incorporate them in various sustainability activities to ensure the success of their company strategies and long-term profitability.

6.2 Research Limitations

The study has produced significant and robust connections between various aspects, such as stakeholders' engagement and sustainable growth and development,

and identified the primary stakeholders and key sustainability indicators. However, our study is not immune to certain limitations, which include the fact that our results refer to the local Dubai setting and cannot, therefore, be taken as general ones and the limited sample size.

To generalize the findings of sustainability issues' role in the civil aviation industry, more research must be conducted in various scenarios. When doing research to gain information applicable to all aspects of a unit (population) but only researching a portion of those aspects, one of the most important concepts to understand is generalization (sample). The study design or the predictive ability of a sample from a population of units tends to be the central objective of considerations often utilized for generalizing. The criteria ignore the population's variety and specific applications of the information derived through generalizations. The most significant drawback associated with generalization is that it does not give proof of a significant relationship for specific persons or groupings. The identification of sustainability indicators and their order of importance will probably shift depending on the context. For instance, it's possible that some of the indicators that were found in Dubai's civil aviation industry aren't relevant in the aviation sectors of other nations.

Along with the requirement that the prospective applications of the underlying assumptions be made straightforward, modifications to the research methodologies are also necessary. The most common argument against generalization is that it might not apply to some populations and might only be of limited use in directing theory and legislation. This demonstrates the importance of clearly expressing the requirement to arrange variables according to the intended applications of knowledge claims.

Further, a larger sample of stakeholders and respondents would be needed to enhance the validity of our results and identify more robust relationships. Finally, the collection of additional survey data could contribute to that.

6.3 Research Implications

Three implications, such as theoretical, managerial, and practical implications, are outlined in the following sections.

6.3.1 Research (Theoretical) Implications

A critical theoretical implication of the study is the need to achieve social responsibility. The focus on social responsibility as an indicator was a significant contribution of the current research from a passengers' perspective, a part of the social sustainability indicator. Also, the previous studies have focused on social responsibility individually as the primary topic, but there was a lack concerning the civil aviation sector of Dubai. The current research helped understand how social responsibility is also essential for customers of airline companies. If the companies are socially responsible, the customers are motivated to fly with such companies.

Our study showed that the views of the various stakeholders play a paramount role in shaping sustainability indicators. The primary stakeholders identified were passengers, civil aviation authorities, Airline companies, and Airport companies. These categories of stakeholders proved important theoretical parameters in understanding the role of the stakeholder society for the viability of the aviation sector. More analysis of these stakeholders might help understand how they react and engage in business decisions in the sector. Further, our analysis showed that regional competition, passenger safety, and quality of life were three major stakeholder priorities for social

sustainability. This indicates that the theoretical analysis of airline passengers' satisfaction and happiness are vital considerations that need further exploration.

The key indicators of economic sustainability were financial knowledge sharing, extensive data management, economic growth, financial compliance, transparent financial reporting, economic development, consumer expenditure, renewable energy/fuel usage, and project cost-benefit analysis. The analysis found that extensive data management, economic growth, and economic development were three significant priorities for ensuring economic sustainability, indicating that technology is one of the significant aspects of achieving economic sustainability. The competent authorities should provide appropriate rules with comprehensive guidelines to aid in the sustainable transformation of the civil aviation sector. It should be in the industry's best interests if civil aviation regulators could establish an effective platform aimed at increasing productivity. Economically, the aviation sector should also focus on improving its competitive advantage, which would also help achieve high economic sustainability. Also, technology and innovative solutions such as extensive data management can help achieve high economic sustainability.

Additionally, stakeholders in the civil aviation sector will better understand the strategic deliverables they need to adapt to propel the industry forward. For example, using renewable energy resources is economically practical and contributes to reversing environmental deterioration caused by pollution. Even though passengers are essential participants in the business, the results demonstrate a minimal number of variables that would be utilized to describe the civil aviation industry's current and future conditions. Also, effective formulation of policies would result in the development of energy

consumption, compliance, international linkages, economic growth, and increased aircraft traffic, among other things. It would achieve the overall objective based on the aviation industry's safe, clean, and sustainable economic growth.

The critical environmental sustainability indicators were ecological awareness, waste reduction, noise reduction, air quality, and compliance with the ICAO program for sustainable aviation. The analysis found that considerable environmental awareness, air quality, and waste reduction were three significant priorities for ensuring environmental sustainability, indicating that the aviation sector should increase awareness among airline companies, passengers, and other stakeholders. Also, various technologies can be used to increase environmental awareness, which would contribute to increasing environmental sustainability. Environmental sustainability indicators are centred on efficient resource allocation, pollution prevention, and the use of ecologically friendly technology. It represents how stakeholders would be encouraged to connect the company's processes and activities with modern equipment compliant with existing standards and requirements associated with modernization. The primary focus to establish social, economic, and environmental sustainability would be to research implementing effective technologies, increasing competitive advantage, increasing the scope of environmental awareness, reducing carbon emissions, and other such factors.

6.3.2 *Practical Implications*

The study's conclusions addressed the industry's key sustainability concerns and also the concerns related to stakeholder theory. Stakeholder theory has been criticized for its ineffectiveness in applicability in actual organizations. Stakeholder methods can

solely counsel administrators to consider not just the stakeholders' interests but also the interests of other 'stakeholders.' However, in the current research, the focus is primarily not on their interests but also on their salient features and how they view sustainability. Also, stakeholder theory has benefits for the organizations, such as higher productivity of employees, better customer retention, and benefits from other stakeholders. Similarly, the civil aviation sector can also focus on the benefits of stakeholder theory by adequately defining the stakeholders, analyzing their activities, looking for gaps in strategic alignment and strategic objectives, and implementing an effective and unique business strategy.

Stakeholder identification of critical sustainability indicators, such as social, economic, and environmental, may aid in reconciling divergent viewpoints on achieving sustainability in the civil aviation sector by pointing to particular agreed-upon directions for action. These indicators summarize the primary perspectives held by stakeholders in the civil aviation sector and serve as a roadmap for future sustainability improvements. Passengers' satisfaction, happiness, and trust are all critical components of the civil aviation sector's development and sustained expansion. Thus, all future growth and services should be centred on the needs of passengers, the key stakeholders in civil aviation globally. Civil aviation authorities should guarantee the implementation of high-quality standards that assist airline firms and other stakeholders in achieving economic viability. Civil aviation authorities should incorporate modern technologies, such as cloud computing, artificial intelligence, big data analytics, and machine learning, and combine them with business and management functions to improve marketing, raise awareness, and achieve a significant competitive advantage. When making decisions, Dubai's authorities should evaluate all social, economic, and

environmental sustainability sub-indices. Civil aviation management should begin by classifying indicators and determining the most crucial parts of sustainable civil aviation, followed by effectively distributing funds.

Additionally, civil aviation authorities should consider being a part of a global network of sustainability-enhancing activities or developing a national network that is adequately connected to global trends. Additionally, the government should enact relevant national laws to control and guarantee the development of the country's civil aviation sustainability. Additionally, the Civil Aviation Authority must adopt fair laws that offer a clear framework for increasing the sustainability of civil aviation.

6.3.3 *Managerial Implications*

The managers in the civil aviation sector should increase their focus on sustainability, which would help them keep passengers, government authorities, top-management authorities, and other stakeholders satisfied. The current research will direct the top management authorities in the sector to concentrate on particular sustainability indicators and sub-indicators and how they will benefit other stakeholders, even though Dubai's civil aviation sector is following the principles of the 2030 sustainable agenda that is supported by the UN sustainable goals.

Also, managers in the civil aviation sector should streamline their operations to operate safely while contributing to progress in three key sustainability considerations: economic growth, social progress, and environmental growth. Like some other corporate risk problems, managers should evaluate and analyse sustainability factors; these elements will likely affect the company's management substantially. Managers in the aviation sector require a sound sustainability policy and framework for effectively

managing economic, environmental, and social concerns to accomplish their organizational sustainability initiatives and satisfy stakeholders' requirements. For this aim, managers should employ the triple bottom line framework to promote passenger and stakeholder satisfaction as the main element of an overall sustainability strategy. Corporate risks related to sustainability, which address environmental, economic, and social risks, should be a priority for executives. For success, the most critical business strategies for sustainability must handle every firm risk holistically and systematically. Business managers must be informed that social and environmental factors must be considered in addition to economic metrics. All metrics involve risk variables that shape productivity to proceed responsibly and sustainably. The current study found that economic, social, and environmental sustainability all play a crucial role in aviation.

6.4 Future Recommendations

Based on the current study's limitations, some important recommendations have been provided for future researchers. Future studies should concentrate on how stakeholders might influence each proposed sustainability indicator to maintain the industry's long-term viability. They must also concentrate on methods to gather and contrast travellers' perspectives in a deeper holistic approach with those of global professionals in the aviation industry. Future research should concentrate on how to use technological advancements to develop the concept of innovation in terms of environmental, social, and economic sustainability. Also, future researchers should integrate the concept of marketing or any other concept along with sustainability to increase its awareness among various stakeholders of the civil aviation sector. Future researchers should focus more on achieving corporate social responsibility in civil aviation.

Additionally, fuzzy AHP can be used for technical aspects of the aviation industry. Fuzzy logic is one of the most well-known and widely applied observable methodologies; hence, future researchers should use it in a range of environmental hazard research, such as air pollution, better environmental outcomes, and similar aspects.

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8 Appendices

8.1 Appendix A: Interview Guide

Topic: Sustainability Factors in the Civil Aviation Sector in Dubai

This questionnaire is purely for ACADEMIC purposes, and request you to share your valuable insights kindly.

Part A:

1. Have you ever travelled by air via Dubai as a passenger?
 - Yes
 - No

Sustainability Factors in the Civil Aviation Sector in Dubai

This questionnaire is purely for ACADEMIC purposes and requests you kindly share your valuable insight.

2. Name (your name will NOT be disclosed)
3. Your e-mail address (your e-mail address will not be disclosed)
4. Gender
 - a. Male
 - b. Female
5. Age group
 - a. 16-20 years
 - b. 21-30 years
 - c. 31-40 years
 - d. 41-50 years
 - e. 51-60 years
 - f. 60+ years
6. Your Educational Qualification
 - a. High School
 - b. Graduate
 - c. Post-graduate
 - d. Doctorate
7. Your Organization/Role
 - a. Passenger
 - b. Civil Aviation Employee
 - c. Airports Company
 - d. Airlines Company

Part B: Sustainability Pillars: Please read carefully

Adopting sustainable practices, whether large or small, can have significant impacts in the long run. Sustainability means meeting our own needs without compromising the ability of future generations to meet their own needs, and it consists of 3 pillars:

- Social sustainability: Universal human rights and necessities are attainable by all people with access to enough resources to keep their families and communities healthy and secure. Healthy communities have just leaders who ensure personal, labour and cultural rights are respected, and all people are protected from discrimination.
- Economic sustainability: Human communities across the globe can maintain their independence and access the resources they require, financial and other, to meet their needs. Economic systems are intact, and activities are available to everyone, such as secure sources of livelihood.
- Environmental sustainability: Ecological integrity and the earth's environmental systems are balanced. At the same time, humans consume natural resources within them at a rate where they can replenish themselves.

8. What are the main factors for the civil aviation sector (Civil Aviation Authorities, Airports, Airlines) to be ECONOMICALLY sustainable? (Select one or more than one that applies)

- a. Passenger
- b. Long Range Planning Cost Savings
- c. Research and Development Spending
- d. Cost of Living
- e. Smart Growth

9. In Your opinion;, what are the other civil aviation sector indicators to enhance economic sustainability?

10. What are the main factors for the civil aviation sector (Civil Aviation Authorities, Airports, Airlines) to be SOCIALLY sustainable? (Select one or more than one that applies)

- a. Quality of Life
- b. Education
- c. Community Development
- d. Equal Opportunities
- e. Law & Governance

11. In Your opinion;, what are the other civil aviation sector indicators to enhance social sustainability?

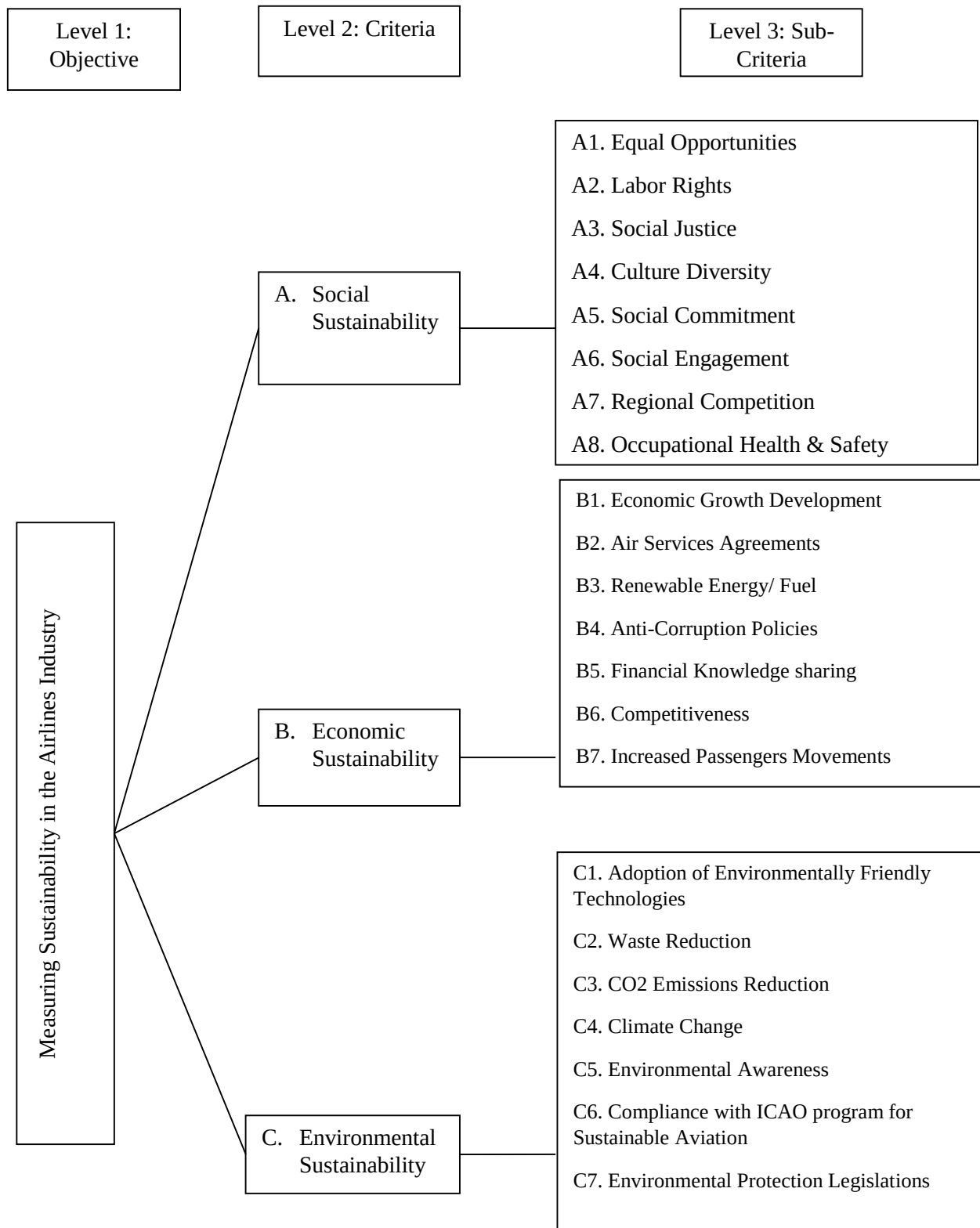
12. What are the main factors for the civil aviation sector (Civil Aviation Authorities, Airports, Airlines) to be ENVIRONMENTALLY sustainable? (Select one or more than one that applies)

- a. Appropriate Resources Management
- b. Environment Protection Policies
- c. Habitat restoration and Preservation Practices Oversight

13. In Your opinion;, what are the other civil aviation sector indicators to enhance social sustainability?

8.2 Appendix B: AHP Form

The Hierarchy of the Measuring Sustainability



Questionnaire

Section 1- Respondent's general information

Please provide the following information:

Respondents Name (Optional): _____

Age: _____

Gender (Please Circle): * Male * Female

Job Title: _____

Organization Name: _____

Department / Division Name: _____

Years of experience: _____

Educational Degree (Please Circle the appropriate): * High School * Diploma * Bachelor * Master * PhD

Email Address: _____

Section 1: The relative importance of main criteria

	Equal Importance 1	Weak or slight importance 2	Moderate importance 3	Moderate plus importance 4	Strong importance 5	Strong plus importance 6	Very Strong importance 7	Very, very strong importance 8	Extremely importance 9	
Social Sustainability										Economic Sustainability
Social Sustainability										Environmental Sustainability
Economic Sustainability										Environmental Sustainability

Section 2: The relative importance of Sub criteria

3.1. Relative importance of Social Sustainability

	Equal Importance 1	Weak or slight importance 2	Moderate importance 3	Moderate plus importance 4	Strong importance 5	Strong plus importance 6	Very Strong importance 7	Very, very strong importance 8	Extremely importance 9	
A1. Equal Opportunities										A2. Labor Rights
A1. Equal Opportunities										A3. Social Justice
A1. Equal Opportunities										A4. Culture Diversity

A1. Equal Opport unities										A5. Social Comm itment
A1. Equal Opport unities										A6. Social Engag ement
A1. Equal Opport unities										A7. Regio nal Comp etition
A1. Equal Opport unities										A8. Occup ational Health & Safety
A2. Labor Rights										A3. Social Justice
A2. Labor Rights										A4. Cultur e Divers ity
A2. Labor Rights										A5. Social Comm itment
A2. Labor Rights										A6. Social Engag ement
A2. Labor Rights										A7. Regio nal Comp etition
A2. Labor Rights										A8. Occup ational Health & Safety
A3. Social Justice										A4. Cultur e Divers ity

A3. Social Justice										A5. Social Comm itment
A3. Social Justice										A6. Social Engag ement
A3. Social Justice										A7. Regio nal Comp etition
A3. Social Justice										A8. Occup ational Health & Safety
A4. Cultur e Divers ity										A5. Social Comm itment
A4. Cultur e Divers ity										A6. Social Engag ement
A4. Cultur e Divers ity										A7. Regio nal Comp etition
A4. Cultur e Divers ity										A8. Occup ational Health & Safety
A5. Social Comm itment										A6. Social Engag ement
A5. Social Comm itment										A7. Regio nal Comp etition
A5. Social										A8. Occup

Comm itment										ational Health & Safety
A6. Social Engag ement										A7. Regio nal Comp etition
A6. Social Engag ement										A8. Occup ational Health & Safety
A7. Regio nal Comp etition										A8. Occup ational Health & Safety

3.2. Relative importance of Economic Sustainability

	Equ al Imp orta nce	We ak or slig ht imp orta nce	Mo dera te imp orta nce	Mo dera te plus imp orta nce	Stro ng imp orta nce	Stro ng plus imp orta nce	Ver y Stro ng imp orta nce	Ver y, ver y stro ng imp orta nce	Extr eme imp orta nce	
	1	2	3	4	5	6	7	8	9	
B1. Economic Growth Development										B2. Air Services Agreements
B1. Economic Growth Development										B3. Renewable Energy/ Fuel
B1. Economic Growth Development										B4. Anti- Corruption Policies
B1. Economic										B5. Financial Knowledge sharing

Growth Development										
B1. Economic Growth Development										B6. Competitiveness
B1. Economic Growth Development										B7. Increased Passengers Movements
B2. Air Services Agreements										B3. Renewable Energy/ Fuel
B2. Air Services Agreements										B4. Anti-Corruption Policies
B2. Air Services Agreements										B5. Financial Knowledge sharing
B2. Air Services Agreements										B6. Competitiveness
B2. Air Services Agreements										B7. Increased Passengers Movements
B3. Renewable Energy/ Fuel										B4. Anti-Corruption Policies
B3. Renewable Energy/ Fuel										B5. Financial Knowledge sharing
B3. Renewable Energy/ Fuel										B6. Competitiveness
B3. Renewable Energy/ Fuel										B7. Increased Passengers Movements
B4. Anti-Corruption Policies										B5. Financial Knowledge sharing
B4. Anti-Corruption Policies										B6. Competitiveness
B4. Anti-Corruption Policies										B7. Increased Passengers Movements
B5. Financial Knowledge sharing										B6. Competitiveness

B5. Financial Knowledge sharing										B7. Increased Passengers Movements
B6. Competitiveness										B7. Increased Passengers Movements

3.3. Relative importance of Environmental Sustainability

	Equal Importance	Weak or slight importance	Moderate importance	Moderate plus importance	Strong importance	Strong plus importance	Very Strong importance	Very, very strong importance	Extreme importance	
	1	2	3	4	5	6	7	8	9	
C1. Adoption of Environmentally Friendly Technologies										C2. Waste Reduction
C1. Adoption of Environmentally Friendly Technologies										C3. CO2 Emissions Reduction
C1. Adoption of Environmentally Friendly Technologies										C4. Climate Change
C1. Adoption of Environmentally Friendly Technologies										C5. Environmental Awareness
C1. Adoption of Environmentally Friendly Technologies										C6. Compliance with ICAO program for Sustainable Aviation
C1. Adoption of Environmentally Friendly Technologies										C7. Environmental Protection Legislations
C2. Waste Reduction										C3. CO2 Emissions Reduction

C2. Waste Reduction										C4. Climate Change
C2. Waste Reduction										C5. Environmental Awareness
C2. Waste Reduction										C6. Compliance with the ICAO program for Sustainable Aviation
C2. Waste Reduction										C7. Environmental Protection Legislations
C3. CO2 Emissions Reduction										C4. Climate Change
C3. CO2 Emissions Reduction										C5. Environmental Awareness
C3. CO2 Emissions Reduction										C6. Compliance with the ICAO program for Sustainable Aviation
C3. CO2 Emissions Reduction										C7. Environmental Protection Legislations
C4. Climate Change										C5. Environmental Awareness
C4. Climate Change										C6. Compliance with ICAO program for Sustainable Aviation
C4. Climate Change										C7. Environmental Protection Legislations
C5. Environmental Awareness										C6. Compliance with the ICAO program for Sustainable Aviation
C5. Environmental Awareness										C7. Environmental Protection Legislations
C6. Compliance with the ICAO program for Sustainable Aviation										C7. Environmental Protection Legislations

