

Identification of sustainability indicators in the civil aviation sector in Dubai: a stakeholders' perspective

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Abstract

Purpose – *The civil aviation sector in Dubai has been contributing to its economic development by enhancing transportation services, allowing for the establishment of trade links, promoting tourism and providing job opportunities. Despite being a thriving sector of economic activity (Dubai was the third busiest airport in the world in 2018), a common understanding among the stakeholders on the sector's long-term sustainability strategy is missing. The purpose of this paper is to contribute to the identification of important sustainability indicators in the civil aviation sector in Dubai.*

Design/methodology/approach – *This study uses the stakeholder theory to identify sustainability indicators. It deploys a qualitative research design that collects data through multiple focus groups, and it accounts for the stakeholders' views toward key sustainability indicators. This research classified stakeholders completely in a separate matrix preventing their integration and therefore the confounding of their views. The study addresses the complexity of sustainability in the sector and identifies key indicators based on comprehensive and valid data from different stakeholders. The study focuses separately on the three pillars of sustainability: social, economic and environmental sustainability and identifies sustainability indicators for each pillar from the views of stakeholders. The study uses thematic analysis to produce results by identifying themes according to the collected data.*

Findings – *The study finds that there is a lack of sustainability knowledge and awareness in the civil aviation sector in Dubai despite its buoyant growth and expansion. The results show that stakeholders highlight the importance of social sustainability indicators that value equitable development in the pursuit of business goals. They also value economic sustainability indicators that focus on changing consumption patterns and increasing preservation. They finally focus on environmental sustainability indicators that promote eco-efficiency and renewable energy. However, considerable differences exist among stakeholders regarding the importance and priority of their suggested indicators.*

Practical implications – *The implications of the study are theoretical and practical. In the case of the former, it would contribute toward the reduction of uncertainty in the civil aviation sector in Dubai regarding the policy actions required to improve the sector's sustainability. It is done by identifying the stakeholders' views on the key sustainability indicators for each pillar of sustainability. In the case of practical implications, the outcomes of the study highlight specific directions that policy actions should take. Although the results are local, they can have tentative global policy implications. Finally, the results of the study are instrumental in addressing the sustainability debate within the civil aviation sector not only in Dubai but also globally.*

Originality/value – *The study extends existing research efforts to identify sustainability indicators in the civil aviation sector by considering the three different pillars of sustainability and by accounting for the diverse stakeholders' views on the identification of key sustainability indicators. The study should be extended to account for the role of technological readiness in the region of other innovative approaches in the current civil aviation sectors.*

Keywords Sustainability, Stakeholders, Dubai, Sustainability indicators, Aviation, Civil aviation

Paper type Research paper

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1. Introduction

The civil aviation sector plays a significant economic role in major regional hubs, such as Dubai and all over the world. According to Çalilyurt and Yüksel (2017), this is because this

sector contributes to economic growth and development through the provision of trade networks, the promotion of tourism and the creation of employment opportunities. Thus, the civil aviation sector is a key element of national and international transportation policy. At the same time, the civil aviation sector contributes significantly to greenhouse emissions by producing approximately 2% of the global emissions volume (Mayor and Tol, 2010). However, this contribution is lower compared to other sectors, such as electricity and heat production, which contribute 25% of greenhouse gas emissions, and agriculture, forestry and other land use, which contribute about 24% of total emissions (Mayor and Tol, 2010). Nevertheless, the civil aviation sector remains a significant factor for the future of the planet and a key element of sustainability considerations. Given its dynamic growth worldwide, the civil aviation sector will have to respond to the challenges of economic growth, environmental protection and sustainability.

Relevant stakeholders have a high awareness of the sector's impact on the economic, environmental and social dimensions of sustainability (Leamon *et al.*, 2019). The sustainability costs of the civil aviation sector are considerable and rising. Palmer (2015) shows that, due to its current growth and technological progress, the civil aviation sector may fail to meet the sustainability challenge. This will have significant implications for the world transport network and especially for civil aviation hubs, such as Dubai. Environmental alarms at the local and global levels increasingly focus on the civil aviation sector and relevant stakeholders have become concerned.

As the civil aviation sector continues to grow, the associated economic, environmental and social costs should be the main concern of the sector's management. Yet, the sustainability implications of the civil aviation sector remain poorly addressed. Letcher and Scott (2012) note that the practice and success of civil aviation diverge from the minimum sustainability standards. Petrişor and Petrişor (2014) argue that the growth of the sector exacerbates this divergence. As a result, the need for examining the relation of the civil aviation sector with the sustainability considerations in mode depth emerges as a key research question, especially for local hubs, such as Dubai (Seabridge *et al.*, 2016). It is especially important to explore the sustainability considerations in this sector in relation to the actions of stakeholders. Agarwal (2012) and Sarkar (2012) note that there has been considerable analysis of the implications of civil aviation for the environment but rather little analysis on the implications for the economic and social dimensions of sustainability.

The current policy approach to deal with all dimensions of sustainability increasingly shifts toward striking a proper balance between efficiency and sustainability goals based on stakeholder engagement. Flouris and Yilmaz (2016) note that the exclusive focus on the environmental impact of the civil aviation sector has resulted in the shaping of policies regarding sustainable civil aviation that pay little attention to all other economic and social indicators of sustainability. They argue that it is necessary to explore a wider range of sustainability indicators in the sector. Jnr *et al.* (2019) note that gaining insight into these indicators is important for developing a framework for the civil aviation adoption of wider sustainability goals.

The main objective of this paper is to explore the relationship between the civil aviation sector and sustainability considerations taking into consideration the role of stakeholders in a major civil aviation hub, Dubai. The latter has been experiencing a rapid expansion of the sector with important implications for the local economy and society and considerable challenges for management. Dubai airports are handling about 90 million travelers annually, which has made it the busiest in the world (Smith, 2019). Thus, the challenge of the sector's sustainability emerges as a key management and policy concern for the emirate that aspires to remain at the top of the aviation list globally. Focusing on and adhering to the millennium sustainability goals of the civil aviation sector is fundamental to the long-term competitiveness of the Dubai hub and therefore to the well-being of the local economy and society as well as the global setting. This paper makes an effort to address this challenge

by focusing on the relation between the civil aviation sector and sustainability by taking into consideration the role of stakeholders. These stakeholders include the government, represented by the civil aviation authority, the passengers, the airlines and airport management companies, each of which plays a role in the determination of the various indicators of sustainability. More specifically, this paper focuses on the following objectives:

- determining the key sustainability issues in the civil aviation sector in Dubai;
- identifying the key stakeholders in the civil aviation sector; and
- exploring the association of the main indicators of sustainability for the key stakeholders in the civil aviation sector.

The research aims to meet these objectives by addressing the following research questions:

RQ1. What do stakeholders mean by sustainability in the civil aviation sector in Dubai?

RQ2. Who are the key stakeholders in the civil aviation sector?

RQ3. What are the main indicators of sustainability for the key stakeholders in the civil aviation sector in Dubai?

The results show that stakeholders demonstrate the importance of social sustainability indicators in the sector that value equitable development in the pursuit of business goals. They also value economic sustainability indicators that focus on changing consumption patterns and increasing preservation. They finally focused on environmental sustainability indicators that promote eco-efficiency and renewable energy. However, considerable differences exist among stakeholders regarding the importance and priority of their suggested indicators.

This paper contributes to the literature in several ways. First, it adds on the relation between civil aviation activity and sustainability (Leamon *et al.*, 2019; Palmer, 2015) by focusing on the identification of important sustainability indicators for an important international aviation hub, Dubai. Second, it adds on the role of stakeholders in addressing important policy questions related to sustainability (Flouris and Yilmaz, 2016). Given the international significance of Dubai as a civil aviation hub, this paper also has considerable global implications for the formation of transportation policy.

The rest of the paper is organized as: Section 2 presents the review of relevant literature, Section 3 describes the data and methodology used for the analysis, Section 4 analyzes the results, Section 5 discusses the results and Section 6 presents the conclusions.

2. Related literature

The literature review comprises three sections. The first analyzes the concept and measurement of sustainability, the second analyzes the role of stakeholders and the third section links civil aviation with sustainability considerations.

2.1 Concept and measurement of sustainability

Gray and Milne (2002) define sustainability as the equitable and efficient distribution of resources that takes place inter- and intra-generationally. They link sustainability to the operation of economic activities that occur within the finite ecosystem. This definition is insightful as it defines sustainability in relation to information on the economy and the corporate environment. However, it has certain shortcomings as it focuses on resource-based constraints alone thereby ignoring environmental and other social issues. Littig and Griebler (2005) define sustainability as the relationship between the economy, society and the environment. They argue that the natural ecosystems provide the context and conditions

for the sustainability of the social systems. For this to happen, the ecosystem must be nurtured, sustained and respected. Upham *et al.* (2003) define sustainability as the strategic and transparent integration of social, environmental and economic objectives into the systematic coordination of main organizational business processes aiming at the improvement of long-term economic performance. All these definitions indicate that sustainability represents the intersection of three pillars: economic, environmental and social. Thus, the three main dimensions of sustainability are environment, economy and society. Below it briefly describes these dimensions.

The first dimension is environmental sustainability. It focuses on the maintenance of natural capital aiming at striking a balance between renewable and nonrenewable resources (Basiago 1999). A number of studies have analyzed the environmental sustainability of the civil aviation sector (Kaszewski and Sheate, 2004; Alyami, 2015; Koç and Durmaz, 2015). These studies show that the growth of the civil aviation sector including the high volume of passenger traffic and cargo transport has resulted in rising stakeholders' concern over its environmental impact. Specifically, questions have been raised regarding the environmental impact of airlines and airports and their reluctance to develop sustainability reports (Kılıç *et al.*, 2019). The environmental impact of airlines has contributed to the debate concerning the global emission of greenhouse gases. For instance, commercial flights usually operate at cruise altitudes of between 8 to 13 kilometers (Martine and Alves, 2015). At such an altitude, aircraft release gases and particulates that alter the atmospheric composition, resulting in climate change. Therefore, stakeholders engaged in efforts to find best practices at reducing the adverse environmental impact of civil aviation. Becken and Mackey (2017) argue that, in addition to greenhouse gas emissions, concerns include noise pollution and land use for the construction of airports. Noise is perceived to be pollution because it has a health impact on those exposed to it. Some of the health effects of this pollution include sleep disturbance, headaches and communication difficulties (McManners, 2016). Some studies further advocate that noise pollution can lead to mental disorders.

The second dimension is social sustainability. It refers to a system of social organization with the role of alleviating poverty (Basiago, 1999). It is evident that the growth of the civil aviation sector, in particular the growth of air passenger traffic, has had a social impact. Upham and Mills (2005) argue that this is the consequence of the fact that the rate of passenger growth does not correspond to the proportion of investment made in areas such as civil aviation infrastructure. Wald *et al.* (2010) note that the resultant impact has included in high frequency of delayed flights, mishandled luggage and a rising number of dissatisfied customers. This implies that social sustainability in the civil aviation sector remains to be achieved. Nonetheless, the above-mentioned factor is debatable because civil aviation has also led to a number of essential social benefits. Letcher and Scott (2012) argue that these include leisure trips that the public can easily enjoy. In addition, air transportation has improved transport infrastructure that is not only safe but also fast. Air transport is the fastest means of traveling in the world that allows people to move from one corner of the world to another in a matter of hours. Payán-Sánchez *et al.* (2018) highlight that air transport also facilitates the provision of essential services. Reddy and Thomson (2015) show that some of these services are related to health care, mail or even education. In addition, emergency aid and humanitarian assistance represent some of the essential services that are provided to people with the help of air transport.

The third dimension is economic sustainability. It is related to the system of production that ensures the satisfaction of present consumption needs without causing compromise on future consumption (Basiago, 1999). Studies indicate that the civil aviation sector has been sustainable in relation to the economic dimension. This is demonstrated by the fact that the sector has led to economic growth and realized financial benefits. Palmer (2015) notes that these benefits include new job opportunities that emerged from the development and

diversification of the civil aviation sector. [Wald et al. \(2010\)](#) argue that airlines as well as many businesses linked to the civil aviation sector, including airports and companies manufacturing aircraft and airport-related equipment and gadgets, continue to report high-profit margins. This is indicative of how well this sector is operating. However, concerns are being raised regarding the cost of achieving economic sustainability ([Junior et al., 2018](#)). This is essential because economic sustainability is directly linked to social and environmental sustainability. The ICAO (International Civil Aviation Organization) (2019) notes that this close relationship is demonstrated by the limits to the sector's growth. In this case, the economy will be no longer sustained if natural resources are depleted, and if the society experiences negative effects because of the advancement of the civil aviation system.

Sustainability is measured by reference to proper sustainability indicators. Indicators are tools that measure the degree of sustainability realized. [Ryley et al. \(2013\)](#) note that these indicators focus on the three pillars of sustainability. Within the civil aviation sector, the indicators of sustainability tend to comprise measures of greenhouse emissions. Governments use these indicators as a top-down approach for valuing and measuring sustainability in various economic sectors, including the civil aviation sector.

Sustainability indicators include environmental, social and economic indicators. Environmental indicators measure various types of air pollution that results in a significant impact on the environment. [Karakoc et al. \(2016\)](#) argue that the effects of air pollution include noise, water pollution, gas emissions that lead to climate change, land degradation, depletion of nonrenewable resources and the death of wildlife. Social indicators usually measure the impact on human health, equity and community livability, on historic and cultural resources, as well as on aesthetics ([Ajmal et al., 2018](#)). [Dhahri and Omri \(2018\)](#) note that, in relation to equity, social sustainability indicators often make comparisons between various social perspectives and impacts. The impact on human health mostly refers to the impact of air transport on the well-being of passengers and other stakeholders. The activity of the civil aviation sector can cause various effects, including injuries, accidents and overall health problems affecting the physical well-being of passengers. Finally, economic indicators show the progress of society toward achieving its economic objectives. [Clune and Zehnder \(2018\)](#) and [Janić \(2011\)](#) argue that these economic sustainability objectives include wealth, employment, income, welfare and high productivity.

Overall, the notion of sustainability comprises the three dimensions of environmental, social and economic sustainability. These dimensions have a life of their own, but they are also closely intertwined. A change in one of them may trigger transformations in the other two. Each dimension is measured by the use of specific indicators that capture different aspects of that dimension.

2.2 Stakeholders and sustainability

[Budd et al. \(2013\)](#) argue that the stakeholder theory has evolved from a pure theory of the firm to a broader approach in explaining relations between business and society. These relations assume three forms: corporate-centric, stakeholder-centric and concept-centric. [Singh \(2014\)](#) notes that the initial development of stakeholder theory was meant to provide a means of explaining the weakness of the input-output economic models. [Garris \(2007\)](#) and [Whitelegg \(2000\)](#) note that this weakness is observed in the production process of a firm with respect to capturing elements of the external business environment. Thus, the stakeholder theory provides a way of understanding the role of external factors in the production process of firms. [Freeman \(1984\)](#) defines a stakeholder as "any group of individuals who can affect or is affected by the achievement of the organization's objectives". The management of stakeholders would help understand how managers interact with stakeholders ([Philips, 1997](#)).

The link between stakeholders and sustainability goes through the stakeholder reference to persons or groups that have claims, rights or interests that might be influenced or violated. [Gray and Milne \(2002\)](#) note that stakeholders often have different expectations in terms of sustainability in the civil aviation sector. This can be attributed to the fact that the goals, demands and opinions of stakeholders vary as well. Stakeholders express concerns regarding the sustainability of the civil aviation sector. This has resulted in growing stakeholder pressure regarding sustainability in this sector taking the form of social and cultural pressures ([Leamon et al., 2019](#)). Thus, meeting sustainability challenges should be an integral aspect of corporate responsibility by companies in the civil aviation sector for it would have a positive impact on their performance ([Landi and Sciareli, 2019](#)). It is possible for businesses operating within this sector to co-evolve their efforts toward maximization of the highest sense of wellbeing ([Newey, 2019](#)). [Garris \(2007\)](#) explains that the key stakeholders are the civil aviation sector members, such as airports, airlines and equipment manufacturers. Another stakeholder is a government that develops policies and regulations for the sector. This stakeholder includes both central and local governments. There are also stakeholders in the form of regulatory authorities whose role is to make regulations for the civil aviation sector. Stakeholders also include representatives from nongovernmental organizations (NGOs) that take a keen interest in matters of sustainability in the civil aviation sector. However, the majority of NGOs tend to address the issues related to civil aviation by focusing only on its environmental impact ([Karakoc et al., 2016](#)). Academic stakeholders in the form of researchers from concerned institutes and universities also contribute significantly to the exploration of sustainability in the civil aviation sector ([Kolk, 2003](#)). [Figure 1](#) depicts the conceptual structure of stakeholder engagement in the civil aviation sector.

2.3 Studies on the sustainability in the civil aviation sector

Sustainability in the civil aviation sector is an increasingly important area of research worldwide. [Table 1](#) shows a summary of relevant studies. However, most studies focus on one only dimension of sustainability ([Alameeri et al., 2017](#)). Thus, there is no study that explores the relationship between sustainability and stakeholders in civil aviation with reference to all three dimensions. Further, none of the previous studies has focused on the

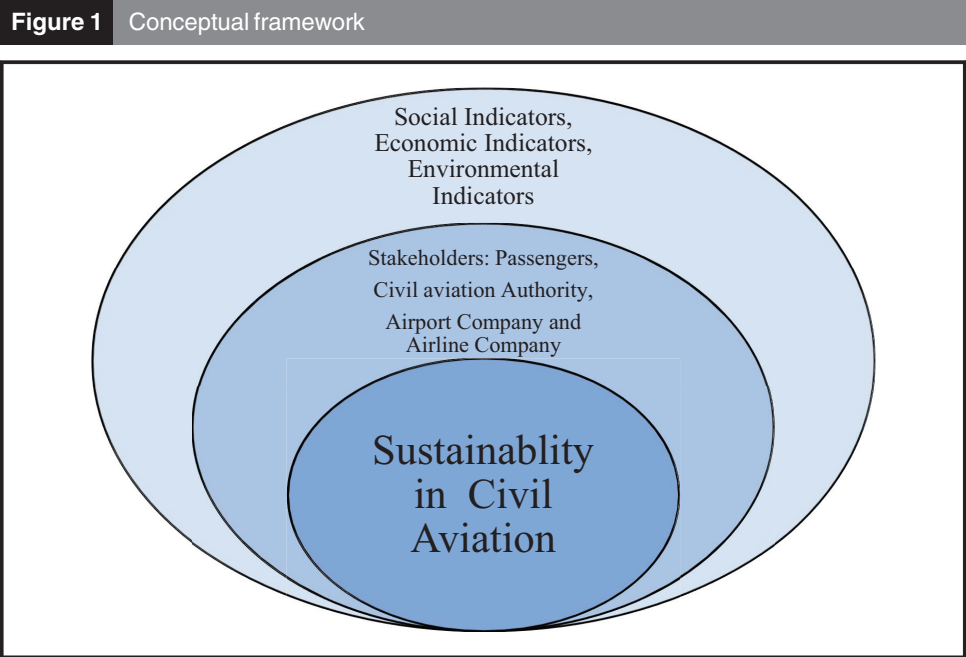


Table 1 Previous studies on sustainability in civil aviation

<i>Authors</i>	<i>Title</i>	<i>Scope</i>	<i>Methodology</i>
Lüdeke-Freund <i>et al.</i> (2012)	"Sustainable plant oil production for civil aviation fuels"	The study explored the emerging importance of the biofuel consumption as an alternative to fossil-based fuels against ecological and social sustainability disadvantages. Authors proposed two plant oil feedstock concepts that would address the aforementioned disadvantages	Literature-based overview
Nakamura <i>et al.</i> (2013)	"Multi-level perspectives with technology readiness measures for civil aviation innovation"	The study develops a new theoretical framework through extension of multi-level perspectives (MLP) to technology readiness level (TRL) to explore why advanced turboprop engine (ATP) introduced to mitigate climate change effects failed to be adopted for improving sustainability in civil aviation	Qualitative
Ryley <i>et al.</i> (2013)	"Valuing air transportation and sustainability from a public service perspective: Evidence from the United Kingdom and the United States".	The study examined public attitudes to socioeconomic benefits of air transportation, contribution of air travel to climate change, and environmental considerations. The study found that there is certain public recognition of sustainability, but few are willing to fly less or pay more for sustainability efforts	Quantitative
Johnson and Gonzalez (2013)	"Estimating cost savings for civil aviation fuel and CO2 emission reductions strategies".	The study discussed and summarized suggestions for gas emissions reduction in civil aviation and outlined emission goals for EU and U.S. civil aviation regulatory agencies, and the UN agency for civil aviation. The general method for cost saving analysis was proposed through the use of fuel prices and non-discounted payback period.	Comparison methodology
Davison <i>et al.</i> (2014)	"Air travel attitude and behaviors: The development of environment-based segments"	The study attempted to understand behavioral consumer response on how air travel affects the environment through the lenses of theory of planned behavior and norm-activation model. Based on the analysis, it shows that sustainability in civil aviation should consider air travel behaviors and consumer psychology in line with ongoing energy saving initiatives	Quantitative
Krenek and Schratzensteller (2017)	"Sustainability-oriented tax-based own resources for the European Union: a European carbon-based flight ticket tax"	The study explored current designs of various civil aviation taxes and their environmental effectiveness. It suggested that current flight ticket tax designs are ineffective in sustainability terms. Hence, a carbon-based flight ticket tax was proposed as the one which supports provisions of the fuel tax as one of the most effective tools in civil aviation sustainability	Systematic literature review
Baumeister and Onkila (2018)	"Exploring the potential of an air transport eco-label"	The study explored potential behavioral changes for social sustainability through air transport eco-labeling. Through a thematic analysis of interviews with sector experts, it was confirmed that eco-labeling increases environmental awareness among passengers, while only one eco label should exist and introduced independent authority	Qualitative

key stakeholders' perspectives in the civil aviation sector to achieve sustainability. This paper aims to fill this gap.

3. Data and research methodology

This research adopts a qualitative research design for this study. Gair and van Luyn (2016) argue that the qualitative research design explains a research problem in a more humanistic manner. Therefore, it can allow a better understanding of people's beliefs, opinions, behaviors and attitudes regarding a phenomenon. This research design is useful in facilitating the comprehension of stakeholders' opinions, beliefs, attitudes and behaviors toward key sustainability indicators in the civil aviation sector in Dubai. The key reason for choosing this research design is its ability to study complex matters with the help of simple tools (Leavy, 2014). This approach allows for the addressing of the complexity of

sustainability and the identification of the sustainability indicators in civil aviation. Moreover, qualitative design provides a more comprehensive use of relevant data. Further, the nature of the sample and the sample size influence the chosen research design. The latter is appropriate for a situation, in which the sample size is small. [Lapan et al. \(2011\)](#) note that the qualitative research design allows the maintaining of flexibility as it comprises a variety of methods and techniques. This approach is essential for this study as it provides a variety of options to explore the research question. The application of this research design ensures that the research results are unbiased. It allows the conducting of the analysis without committing serious errors that could compromise the credibility of the findings.

The sampling method used is suitable for the project. The sample population is comprised of top- and middle-level management members of the following stakeholder groups: civil aviation authority, airlines and airport operator companies. However, a different approach was applied to the selection of passengers. This research examined the list of frequent flyers thoroughly as this is a measure of the frequency of passengers' contact with the civil aviation sector. Purposive sampling was used to select the sample size ([Hammarberg et al., 2016](#)). It is important to ensure that the chosen sample size is sufficient to increase the understanding of sustainability indicators in the civil aviation sector in Dubai. [Hammarberg et al. \(2016\)](#) argue that purposive sampling allows a researcher to select only those participants that are able to be a source of in-depth and detailed information on the research question. [Gair and van Luyn \(2016\)](#) note that this sampling method is subjective in nature. In fact, the selection of the participants depends mainly on the criteria determined by a researcher. The main reason to justify the usage of a purposive sampling technique for this study is to enable the generalization through the collected data. Another reason is the time and cost saving in sampling a population of interest. This is due to the flexible nature of this method of sampling, which is adaptive to changes in circumstances. In this paper, the sample population (n) selected includes 30 agents from each stakeholder. A sample size of 30 is sufficient to facilitate the process of data collection given the use of qualitative methods ([Leavy, 2014](#)). The sample has been selected using the following criteria. First, the people selected had to be in close contact with the civil aviation sector in Dubai as passengers, civil aviation authority managers, airport company managers and the national airlines managers. Second, this paper also imposed an age limit of 25 years and above to use more conscientious views. This was essential to ensure that those people selected had adequate experience working with the civil aviation sector of Dubai. Finally, the persons chosen had to be residents of Dubai, to ensure that they have a genuine interest in the sustainability issue.

This research uses a data collection method that relies on the use of focused groups for each category of the stakeholders, including the participation of 45 passengers, 35 managers from the civil aviation authority, 30 managers from the airport company and 38 managers from two national airlines companies in Dubai, with a total number of 148 participants. [Table 2](#) provides a breakdown of the sample. The key reason that justifies the use of focused groups for data collection is that they are a source of fast data collection compared to holding individual interviews. For this same reason, this method is also cost saving in comparison to holding interviews with individual participants. The use of this data collection method is also based on the fact that it can be used to allow for clarification of collected data because the researcher interacts with the participants. This is also essential in enhancing the validity of the collected data. The fact that the researcher is able to collect information from the non-verbal cues of the participants also justifies the use of focused groups as a data collection method. The application of this data collection method is in line with the purposefully selected group of participants. It focuses on an in-depth understanding of the sustainability indicators within the civil aviation sector as per the associated stakeholders. Therefore, according to [Ellingson \(2017\)](#), focused groups can create much deeper and broader insights into the research question. Moreover, researchers used focus groups because they usually provide accurate details and present new facts related to the research question. Finally, this data collection method is preferred

Table 2 Respondents' demographic information

	Passengers	Civil aviation authority	Airport company	Airline company	Total respondents
Number of respondents	45	35	30	38	148
Age group (years)	25–30 (5)	25–30 (5)	25–30 (5)	25–30 (8)	
	31–40 (6)	31–40 (4)	31–40 (11)	31–40 (9)	
	41–50 (12)	41–50 (6)	41–50 (4)	41–50 (5)	
	51–60 (3)	51–60 (7)	51–60 (6)	51–60 (10)	
	60+ (19)	60+ (13)	60+ (4)	60+ (6)	
Gender	M (27)	M (22)	M (18)	M (26)	
	F (18)	F (13)	F (12)	F (12)	
Education	Graduate (25)	Graduate (6)	Graduate (10)	Graduate (10)	
	Postgraduate (16)	Postgraduate (25)	Postgraduate (15)	Postgraduate (26)	
	Doctorate (4)	Doctorate (4)	Doctorate-5	Doctorate-2	
Experience with Dubai civil aviation sector	1–5 years (10)	1–5 years (8)	1–5 years (15)	1–5 years (18)	
	5–10 years (25)	5–10 years (12)	5–10 years (10)	5–10 years (12)	
	Above 10 years (10)	Above 10 years (15)	Above 10 years (5)	Above 10 years (8)	

Note: M = Males; F = Females

for this study because it provides interactive feedback. [Lapan et al. \(2011\)](#) argue that focused groups foster a process of interactive research, which allows a researcher to gather data from the provided responses and assure reliability. Thus, focus groups foster an interactive discussion process, ensuring that useful data is collected. The data collection session lasted for 60 min with the researcher meeting with the individual groups of passengers, members of the civil aviation authority, Airport Company and Airline Company.

Some of the factors attributed to the reliability of the qualitative method used which include trustworthiness, credibility, transferability, dependability as well as confirmability. In the case of trustworthiness, the participants who included the top- and middle-level management members of the Civil Aviation Authority, airlines and airport operator companies were assured of confidentiality and this led to the building of confidence. The assurance helped in collecting data without fear of victimization or exposure, and this confirms the aspect of trustworthiness in the qualitative method used in this study. In the case of credibility, the data obtained from the top- and middle-level management members of the Civil Aviation Authority, airlines and airport operator companies were considered primary data because the interviewees can be reached anytime for verification and confirmation. Primary data that is verifiable is considered credible. The verification of data serves as a key ingredient of confirming that the qualitative method used in the study is credible and can be trusted ([Patnaik, 2014](#)). Transferability can also be called generalizability. It is also called external validity. Generalizability is achieved when the readers or audience is given evidence that the results of the study could be applied in other contexts or populations. The qualitative method used in the present study showed findings, which can be applied in other populations or contexts. For example, establishing the indicators of sustainability can be done using the same method in other settings, such as the automobile industry. The data is considered dependable because it was collected from the primary sources, which form part of the aviation industry. There is a need to have an external audit on the research method to ascertain that the data is dependable. This process can be summed up as the appraisal, elucidation and recommendations of the participant's evaluation. The reliability of the method is anchored on the replicability of the procedures as well as outcomes. Because research methodology involved primary data, it can be deemed reliable because the data collected can be quickly confirmed or verified from the sources. The essence of the reliability of the qualitative study lies with the aspect of consistency of the processes and outcomes. The validity of the qualitative method applied in this study is attributed to its ability to exhibit generalizability, which implies that the results can be applied in other cases ([Houghton et al., 2013](#)). Besides, the method draws its

validity from the consistency of the results. Such consistency can be always tested by the respondent validation technique, which involves verification of the initial outcomes with what the participants provided during the interview.

Finally, this research adheres to the requisite ethical standards. Researchers adhered to proper ethical standards with the intention of ensuring adequate protection of participants' personal information and of ensuring the accuracy of the data and analysis before collecting data, they have informed the participants so that they could give their consent. Therefore, following [Silverman's \(2016\)](#) approach, the researchers firstly briefed the participants on the research question and the matters related to the objective of the study. This was done in a transparent manner, following the recommendations of [Ellingson \(2017\)](#). Consent forms have been distributed among the participants, asking them to sign them as evidence of their consent to take part in the study. Clearly avoided any act of coercion and deception in collecting information. Further, the confidentiality of the identity and the views of the participants in the study has been maintained. Following the recommendation of [Hammarberg et al. \(2016\)](#), code names were used and pseudonyms instead of the real names of the participants. In addition, it has been ensured that no obvious identifiers were used, to ensure that the identification of the participants is not possible. In the study, the ethical standards were observed of causing no harm to the participants. The participants felt comfortable to participate. In fact, researchers checked that the participants had their physical and psychological well-being maintained and provided ([Gair and van Luyn, 2016](#)).

4. Analysis of results

Thematic analysis is a qualitative data analysis method aimed at interpreting the findings of a study. As shown by [Lapan et al. \(2011\)](#), thematic analysis recognizes patterns that lead to the identification of key themes of the collected data. In this paper, this data analysis method was deployed as a means to identify patterns from the collected data that can answer the research question. The themes are the sustainability indicators identified by stakeholders. This study applied thematic analysis for it makes it easier to assess qualitative data because of enabling flexibility during the selection of a theoretical framework. Consequently, the thematic analysis works in tandem with the selected data collection method. In the case of this research study, both methods allowed gathering extensive and detailed data. The results of the analysis were presented as per the narratives, which emerged from the respondents during the focus group sessions.

The results of this study are shown in [Tables 3–5](#). Each table captures one of the three different dimensions of sustainability. [Table 3](#) presents the view of the different stakeholders regarding the important social sustainability indicators in the civil aviation sector in Dubai. The airports and civil aviation authorities identified the majority of the sustainability indicators. In particular, airports identified 24 different social sustainability indicators. Airlines identified 19 social sustainability indicators. The civil aviation authority identified 21 social sustainability indicators. Passengers identified only 9 social sustainability indicators. There is obviously a divergence of views among the different stakeholders about important sustainability indicators. [Table 4](#) presents the view of the different stakeholders regarding the important economic sustainability indicators in the civil aviation sector in Dubai. Stakeholders identified a variety of economic sustainability indicators. The civil aviation authority, airlines and airports identified almost the same number of indicators. Specifically, both the civil aviation authority and airports listed 24 economic sustainability indicators. Airlines highlighted 21 economic sustainability indicators. Passengers identified 12 economic sustainability indicators. [Table 5](#) presents the view of the different stakeholders regarding the important environmental sustainability indicators in the civil aviation sector in Dubai. The civil aviation authority and airlines identified 10 environmental sustainability indicators. Airports suggested a slightly higher number of environmental sustainability indicators. Passengers identified the lowest number of indicators compared to the other stakeholders. Despite the fact that environmental sustainability is the main reference point

Table 3 Stakeholders' views of social sustainability indicators

<i>Passengers</i>	<i>Civil aviation authority</i>	<i>Airlines</i>	<i>Airports</i>
1. Quality of life	1. Equal opportunities	1. Jobs opportunities	1. Airport jobs opportunities
2. High education	2. Regional political relations	2. Passengers safety	2. Passengers safety
3. Community development	3. National noise level	3. Regional competition	3. Regional competition
4. Equal opportunities	4. Readiness and contingency plans	4. Emergency readiness and contingency plans	4. Social coherence
5. Law and governance	5. Social security	5. Social security and trust	5. Readiness and contingency plans
6. Assuring passengers rights	6. Community trust	6. Social engagement and participation	6. Social security and trust
7. Corporate social responsibility policies	7. Social engagement and participation	7. Organizational development	7. Social engagement and participation
8. Educational campaigns	8. Quality of life	8. Social loyalty	8. Airport life quality
9. Culture diversity adoption	9. Social loyalty	9. Social commitment	9. Organizational change readiness
	10. Social commitment	10. Flexibility	10. Social loyalty
	11. Intergenerational equity	11. Social benefits	11. Social commitment
	12. Community initiatives	12. Social awareness	12. Intergenerational equity
	13. Social awareness	13. Social justice	13. Social benefits and rewards
	14. Social justice and equity	14. Globalization	14. Social awareness
	15. Culture diversity	15. Passengers' satisfaction	15. Social justice
	16. Social happiness	16. Labor rights	16. Regional equity
	17. Human rights assurance	17. Air crew health and safety	17. Culture diversity
	18. Labor rights	18. Culture diversity	18. Customer happiness
	19. Occupational health and safety	19. Share of UAE nationals in the workforce	19. Dependency ratio
	20. Aviation quality control activities		20. Human assets and labor rights
	21. Emiratization (nationalization)		21. Occupational health and safety
			22. Governance
			23. Cultures diversity
			24. Emiratization (nationalization)

in the sustainability debate worldwide, the identified number of sustainability indicators is smaller compared to the number of indicators identified for social and economic sustainability. This implies that stakeholders may have a view that diverges from the average views in the sustainability debate and that social and economic sustainability may preoccupy a higher priority in their concerns. Finally, based on the above findings regarding the stakeholders' view of each dimension of sustainability, [Figure 2](#) draws commonalities among their viewpoints.

5. Discussion

The results of the study show that each stakeholder expresses unique and diverse views regarding what constitutes a sustainability indicator in the civil aviation sector. However,

Table 4 Stakeholders' views of economic sustainability indicators

<i>Passengers</i>	<i>Civil aviation authority</i>	<i>Airlines</i>	<i>Airports</i>
1. Long range planning	1. Successful bilateral agreements of air rights	1. Civil aviation fuel consumption	1. Infrastructure continuous improvement
2. Cost savings	2. Contribution of air transport to the national gross domestic products	2. Renewable fuel/energy for civil aviation	2. Civil aviation fuel consumption ration
3. Research and development spending	3. Air traffic management efficiency	3. Big data management	3. Renewable fuel/energy for civil aviation
4. Cost of living	4. Volume of air transport	4. Compliance	4. Big data management
5. Smart growth	5. Civil aviation accidents prevention	5. Knowledge transformation	5. Economic growth
6. Revenues and expenses management	6. Big data management	6. Economic growth	6. Planned aerodrome expansions
7. Business diversity	7. Compliance	7. Economic development	7. Environment related charges
8. Services and prices management	8. Sharing knowledge	8. Transparent reporting	8. Transparent reporting
9. Smart travelling solutions	9. Economic growth	9. Airlines ranking	9. Economic ranking
10. Usage of alternative energy	10. Economic development	10. Dynamic efficiency	10. Sustainable development goals
11. Social engagement	11. Economic ranking	11. Airlines' resources consumption	11. Dynamic efficiency
12. Knowledge sharing	12. Sustainable development goals (SDGs)	12. Regular financial audits	12. Airport resources consumption
	13. Dynamic efficiency	13. Politics	13. Inflation rates
	14. Anti-corruption policies and oversight	14. Competitiveness	14. Increased passengers' movement
	15. Political relations	15. Aircraft (a380) transporting a maximum number of passengers.	15. Increased airlines movement
	16. Inflation rate	16. Waste production	16. Investments
	17. Financial productivity	17. Consumer expenditure	17. Waste production
	18. Trading	18. Renewable energy resources	18. Consumer expenditure
	19. Investments	19. Automated services systems	19. Renewable energy resources
	20. Employment population ratio	20. Cost reduction policies	20. Energy consumption
	21. Energy consumption	21. Performing cost-benefit analysis for projects	21. Automated services systems
	22. Cost reduction policies		22. Performing cost-benefit analysis for its projects

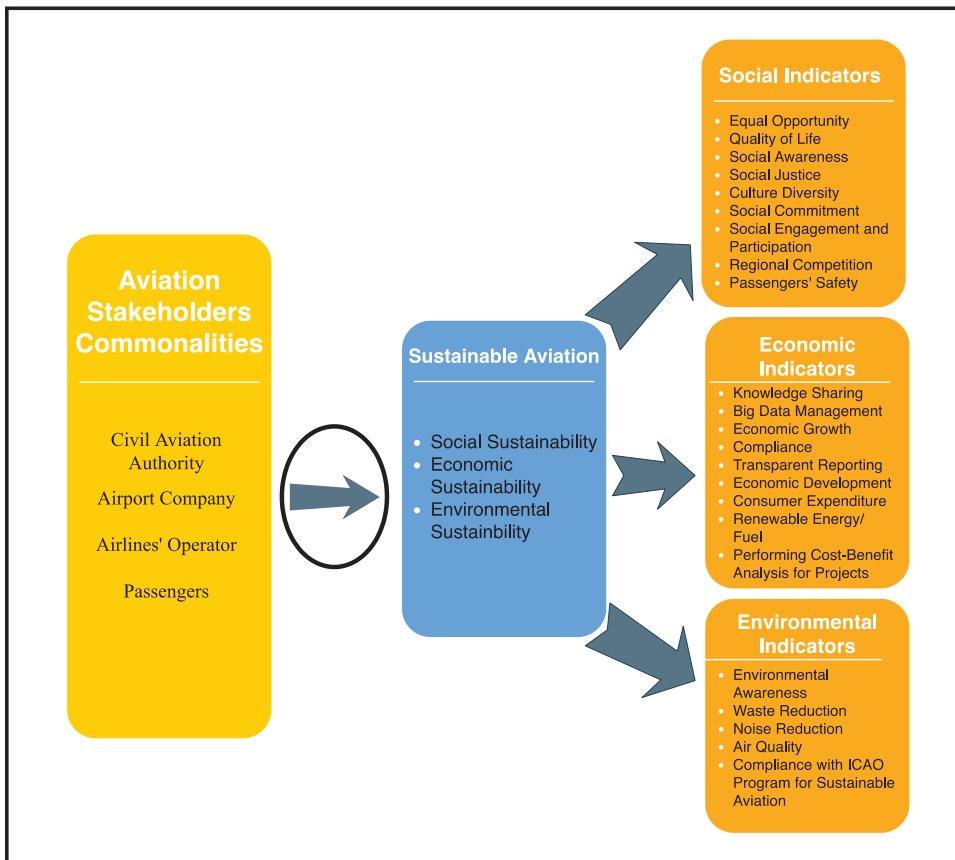
Table 5 Stakeholders' views of environmental sustainability indicators

<i>Passengers</i>	<i>Civil aviation authority</i>	<i>Airlines</i>	<i>Airports</i>
1. Appropriate resources management.	1. Emissions reduction	1. Adoption of environmentally friendly technologies	1. Energy management
2. Environment protection policies	2. Noise reduction		2. Airport site CO ₂ emissions reduction
3. Habitat restoration and preservation	3. Awareness	2. Waste reduction	3. Adoption of environmentally friendly technology
4. Practices oversight	4. Rules and regulations	3. CO ₂ emissions reduction	4. Waste reduction management
5. Awareness	5. Climate change	4. Aircraft greenhouse gas (GHG) emissions	5. Noise reduction
6. Usage of clean energy	6. Carbon footprint	5. Awareness	6. Electrical vehicles usage
7. Research and development for new nonfuel-based propulsion systems	7. Air quality	6. Emissions trading scheme	7. Rationing water consumption
8. Resource relocation	8. Airport land use	7. Climate change	8. Fuel reduction policies for the airside vehicles
	9. Epidemiology knowledge	8. Air quality	9. Carbon footprint
	10. Compliance with the ICAO program for sustainable civil aviation	9. Aircraft fleet efficiency	10. Air quality
		10. Aircraft lifespan and disposal	11. Airport water quality
			12. Epidemiology knowledge
			13. Compliance with the ICAO program for sustainable civil aviation
			14. Reducing of foreign objects damage (FOD) at the airside of the airport

based on the commonality analysis, there are commonly agreed upon indicators among the four groups of the stakeholders for environmental, social and economic pillars of the sustainability in the civil aviation sector.

The results demonstrate that the environmental sustainability indicators identified by stakeholders are mainly related to the elimination or reduction of unsustainable patterns of consumption. This is in tandem with the findings of [Karakoc et al. \(2016\)](#) who identify these unsustainable patterns of consumption as including depletion of nonrenewable resources and land degradation. This is supported by the view that refers to research and development of new nonfuel based propulsion systems, consideration for use of electric vehicles and adoption of fuel-reduction policies for airside vehicles. Therefore, through a range of activities, stakeholders propose ensuring higher efficiency in terms of consumption and the implementation of environmentally sound approaches. They mention the importance of focusing on renewable energy. It is evident that stakeholders, such as airlines, airports and the civil aviation authority, support the development of renewable fuel, and this is in line with the findings of [Garris \(2007\)](#) and [Kolk \(2003\)](#). Furthermore, the results show that stakeholders believe that environmental protection would entail effective regulation toward this process. This is evident by indicators, such as environmental protection policies, practices oversight, rules and regulations, fuel reduction policies and compliance with ICAO programs ([ICAO \[International Civil Aviation Organization\], 2019](#)). On the contrary, some stakeholders mention that the best ways of ensuring civil environmental sustainability are directly related to the protection of the environment. The

Figure 2 Commonalities among all stakeholders' views of sustainability indicators in civil aviation



environmental indicators, such as habitat restoration, emission reduction, noise reduction, waste reduction management, adequate airport land use and air quality control, support this.

Social sustainability indicators identified by stakeholders point to a need for equitable treatment and development in the civil aviation sector. Many stakeholders reveal that their future expectations are equality in air transport. Particularly, they expressed concerns regarding equitable development for all affected by this sector. Identified social sustainability indicators, such as equal opportunities, social justice and equity, regional equity, labor rights and human rights assurance, support this. In addition, social indicators revealed the need for achieving social benefits that would ensure the overall well-being of communities, which is in tandem with the findings of [Dhahri and Omri \(2018\)](#). Other social sustainability indicators are quality of life, community development, corporate social responsibility, educational campaigns, job opportunities, social commitment and social benefits. Some of these indicators aim to ensure the well-being of those who are in direct contact with the civil aviation sector and include passenger happiness, occupational health and safety, passenger satisfaction and assuring passengers' rights, which aligns with the findings of [Gray and Milne \(2002\)](#).

Finally, the stakeholders expressed their view of what constitutes economic sustainability in the civil aviation sector. A considerable number of indicators express concerns about ensuring economic growth and development. Some indicators that are in line with this perception include smart growth, contribution of air transport to the national gross domestic

product (GDP) and economic ranking. Additionally, a number of economic sustainability indicators are in tandem with a plan for achieving economic sustainability as argued by [Clune and Zehnder \(2018\)](#). Specific economic sustainability indicators that align in this manner include trading, investment, cost reduction policies, cost-benefit analysis, long-range planning, cost savings, revenue and expenses management and big data management. It is important to add that some economic sustainability indicators are identified as key factors affecting the economy, such as inflation, cost of living, compliance and politics.

6. Conclusions

Sustainability is a key policy and strategy issue in the civil aviation sector. It is particularly central concerning the economic, environmental and social impacts of this sector. As this sector continues to develop, the sustainability implications must be stressed further among all stakeholders. This is especially important for Dubai that aspires to be a world aviation hub. This study shows that the stakeholders in the civil aviation sector include a wide range of interests: operators, management companies, regulators and passengers. These stakeholders have different views regarding what constitutes a sustainability consideration for the sector. The different views stress across all three key dimensions of sustainability: social, economic and environmental sustainability. These differences result from the stakeholders' interests, concerns and experience. However, all the stakeholders share the same view about certain sustainability indicators in each of the three dimensions of sustainability. This indicates the commitment of these stakeholders toward achieving certain aspects of sustainability in the civil aviation sector in Dubai. These can be a common ground for initiating sustainability-minded reforms in the sector and therefore be at the center of managerial policy considerations.

More specifically, stakeholders demonstrate a high level of awareness regarding certain social sustainability indicators in the sector. Stakeholders call for adherence to equitable treatment and health-minded implications of civil aviation. The sector needs to embrace a more equitable development in the pursuit of business goals and sustainability. Stakeholders have the view that the economic sustainability indicators in the sector should include a focus on changing consumption patterns and increasing preservation. Stakeholders call for the use of implementing policies toward increasing efficiency, public education and renewable energy to foster economic sustainability in the civil aviation sector. Finally, stakeholders take the view that environmental sustainability indicators remain the focus of sustainability concerns in this sector. The sector has to commit to the reduction of harmful effects of civil aviation activities on the environment. Stakeholders demonstrate a willingness to facilitate this reduction and a commitment to improving environmental sustainability.

The research is not without limitations. An important limitation is that the data sample is limited to respondents that resided in Dubai alone. Thus, the results can only tentatively be generalized and used to inform policy in other jurisdictions. Further, future studies should focus on how stakeholders can affect each of the identified sustainability indicators to ensure the sector remains sustainable. They should also focus on how to collect the views of passengers in sustainability on a more comprehensive manner and compare them with those of world experts in the civil aviation sector. Future studies should also focus on how to explore technological advances to promote the notion of "environmental intelligence" among consumers of aviation services. Finally, the implications of sustainability taxation are another promising area of future research that the civil aviation sector must be concerned with.

6.1 Theoretical implication

One of the critical theoretical implications of the study is how to achieve social responsibility. From the results of the survey, the views of various stakeholders play

paramount roles in shaping the indicators. It is not easy to have a direct measure of social sustainability; however, through different signs, it is easy to determine the level of social sustainability in the industry. The results illustrated that four key stakeholders play a significant role in defining the indicators of social responsibility in the aviation industry. They include passengers, Civil Aviation Authority, airlines and airports. The outcomes of the study showed that the airports lead in the exhibition of the indicators. The airports showed 24 social indicators, which included jobs, safety of passengers, regional competition, as well as social security for the employees, among others. The Civil Aviation Authority came second in the exhibition of the indicators that determine a stable social sustainability milieu. Some of these include equal opportunities, regional political relations and quality of life, among others. The airlines came third with 19 indicators, whereas passengers closed the list with only nine. Some of the signs that the passengers exhibited include quality of life, higher education, and cultural diversity, among others. From the results, the theoretical implication would need the management to improve various aspects around the airports and Civil Aviation Authority in terms of the policy framework, which would go a long way to transforming the operations and overall functionality to ensure efficiency, top quality services, and friendly pricing. All these indicators are essential because they offer insight to stakeholders as they identify the contribution of each stakeholder to achieve the set goals. One of the main areas of focus is customer satisfaction as it creates a sense of happiness, eventually promoting growth and sustainability. The relevant regulatory institutions should formulate proper regulations that have a clear framework to help to reform civil aviation in terms of sustainability. It would be in the best interest of the sector if the civil aviation authorities could set up an integrated system to promote efficiency. Such changes would automatically replicate in the lives and welfare of the other stakeholders, such as passengers and employees. It implies that the top management would first embrace the intended changes. For instance, all top-level management departments need to adopt a comprehensive, collaborative strategy to implement changes effectively and make sure they are standardized. Such steps would have achieved the overall perception of attaining social sustainability.

Overall, the outcomes of this study indicate that the social aspect of sustainability requires the creation of an atmosphere where equitable treatment and development are facilitated in the civil aviation sector. Moreover, there is a future expectation that more equality will be realized in air transport in the sense that all departments would attain some level of development. Some of the projected areas of expected social sustainability indicators might include social justice, equity, labor rights, human rights assurance, as well as equal opportunities. Achieving social benefits ensures the general well-being of the community as the living standards are improved (Dhahri and Omri, 2018). Enhanced living standards of the population are in line with the corporate social responsibility to make sure the community benefits from the sector. It is made possible through job opportunities, a social commitment. In addition, those directly in contact with the sector benefit through passenger satisfaction, occupational health and safety, as well as assurance of the passenger rights.

In the case of economic sustainability, the result from the study illustrates that the Civil Aviation Authority, airlines, as well as airports gave almost the same number of indicators ranging from 21 to 22. The theoretical implication of this pattern is that the management would need to put more energy in improving the foundations, structures and policies governing the three stakeholders because they define the overall welfare and functionality of the Aviation Industry. It is not only locally but also in the global sphere. Some of the predominant indicators across the three aspects include increased airline movements, compliance and economic development. With this exhibition, the stakeholders in this industry would be well informed on the strategic deliverables that they need to embrace to make the industry proliferate to higher heights. For instance, the issue of adopting renewable energy is not only cost-effective but also helps in combating environmental degradation attributed to pollution. Even though the

passengers are part of the key players in the industry, the outcomes illustrate a relatively low number of indicators that would be used to define the present and future state of the civil aviation industry. Such understanding is attributed to the fact that the passengers are on the receiving end in that the three key stakeholders listed above define their status in the aviation industry, particularly on the welfare, level of the quality of services offered and pricing. In this way, the results would help in formulating sound policies that would see the evolution of energy use, compliance, international interconnections, economic growth, as well as increased airline movements, among other things. It would lead to the attainment of the overall goal, which is founded on safe, clean and sustainable economic development in the aviation industry. The results illustrate the specific areas that need improvement relative to modern world innovation. In line with this focus, there is a need for the stakeholders to use the indicators effectively in streamlining the aviation industry to meet global goals, such as sustainable development goals and other international agreements, hence guiding safe, clean and sustainable global business.

Overall, the outcomes of the study regarding economic sustainability illustrate that for the sector to achieve economic sustainability, elaborate systems should be in place to facilitate development and ensure economic growth. Changes such as operations would effectively influence indicators such as the financial ranking of the sector, smart growth and contribution of air transport to the national GDP. To realize profitability and attract investors, more research should be done on the sector to get a picture of the situation on the ground for efficient planning. Several indicators that are to be considered are cost reduction policies, big data management, trading, cost-benefit analysis, cost-saving, long-range planning and investment. It is also essential to take into consideration certain factors affecting the economy, such as compliance, inflation, cost of living, as well as politics. The presence of the globally integrated system would make sure the sector benefits from a stable managerial, regulatory and moral force required to contain sustainability concerns in the civil aviation sector at the national level.

Regarding environmental sustainability, once again, the results of the study exhibit the airport as the primary stakeholder in defining the state or direction in which a particular aspect would be sustained. The airport has 14 indicators, which include compliance to ICAO programs for sustainable civil aviation, carbon footprint, air quality and energy management, among others. It shows great potential. Therefore, this illustration would help the concerned players in the industry that if proper management, structures, policies and other aspects were streamlined in the airport facilities, then a significant step toward environmental sustainability would be made. It does not mean that passengers, Civil Aviation Authority, and airlines are not involved actively in boosting ecological sustainability. The three stakeholders exhibit between 8 and 10 indicators, which plays a significant role in defining and promoting environmental sustainability. Some of the indicators in this category revolve around effective resource management, reduction of emissions, and adoption of environmentally friendly technologies. It is a depiction that the stakeholders would be motivated to align the systems and operations within the industry with the modern technology that is in tandem with the international standards and needs that come along with modernization.

The overall observation and analysis of the results illustrate that the implication would revolve around structural improvement, policy formulation, renewable energy as well as customer satisfaction and efficiency in service delivery, among others. The research would recommend that Dubai policymakers consider the identification of sustainability indicators in the civil aviation sector before or while formulating future intervention or expansion plans. Taking into consideration the fact that change is a continuous process, plans should be adjusted and executed in successive phases to accommodate advancements in technology. Because this is a huge task, the civil management is supposed to begin by

outlining the indicators and, consequently, all the dimensions of sustainable civil aviation and allocate funds gradually to ensure the project runs smoothly.

6.2 Practical implications

The results of the study are instrumental in addressing the sustainability debate within the civil aviation sector in Dubai but also globally. The stakeholders' identification of key sustainability indicators can help resolve the conflicting views on achieving sustainability in the civil aviation sector by pointing to certain shared upon directions for action. These indicators demonstrate the key perceptions shared by stakeholders in this sector. Thus, they are essential in defining the key starting points for sustainability-enhancing reform in the future. They are also illustrative of the key contributions that each stakeholder could make toward achieving this goal. The passengers' satisfaction is an important element to lead to happiness to ensure growth and sustainability. Hence, all future expansion and services should be geared to the sustainability-minded views of passengers as the main stakeholders of civil aviation in any part of the world.

Given the identification of sustainability indicators in the civil aviation sector, it is recommended that Dubai policymakers should consider them before establishing any future intervention and expansion plan. Although it is understandable that the change is a long-lasting process, this study recommends that plans should adjust properly to implement key changes in successive phases. The civil aviation management should begin with the categorization of indicators and the identification of the most significant dimensions of sustainable civil aviation and subsequently allocate funds accordingly. A further recommendation is that civil aviation authorities should consider joining a globally integrated system of sustainability-enhancing actions or establishing a national one properly aligned to global trends.

The results of the study show that each stakeholder holds a unique perception of sustainability in all three dimensions. This shows that the conception and identification of sustainability in the civil aviation sector is a complicated and multidisciplinary issue, calling for the implementation of a systems approach to reform. A globally integrated systems approach will provide the sector with the strong moral, managerial and regulatory force needed to address sustainability problems in its civil aviation sector at the national level with global repercussions. It will also allow for better monitoring of ongoing reforms. Finally, this research recommends that the government should enact proper national law to govern and protect sustainability-enhancement in civil aviation in the country. The Civil Aviation Authority must also put in place proper regulations that provide a clear framework for reforming sustainability in civil aviation.

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