A SUSTAINABILITY OVERVIEW OF THE BEST PRACTICES IN THE AIRPORT SECTOR

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Abstract: This paper refers to the way the sustainable development issues are being addressed by some of those airports that have been considered the best in the world from the perspective of costumers. Firstly, an introduction is given about the rapid growth in this sector in the past few years. Secondly, a special attention is given to the increasing related impacts in the socio-economic and environmental dimensions. Subsequently, a brief introduction about the criteria commonly used for assessing the quality of airport services around the world is provided. Finally, additional criteria regarding the expectations of several stakeholders on sustainability issues is provided and used for investigating the extent to which the acclaimed "best airports" address these issues.

Keywords: Airport Sector, Sustainability Reporting, Sustainable Development, Triple Bottom Line.

1. Introduction

The air passenger transport sector has been in a financial crisis in the past 12 years due to external factors such as the 1997 Asian financial crisis, the 2001-2002 global recession that was exacerbated by the terror attacks of September 11, 2001, the soaring fuel prices registered from 2003 when the Second Iraq War erupted, and more recently, the global financial crisis that emerged in 2007 and is still unresolved. Last but not least, the sector has been also impacted by global epidemics such as the avian flu outbreak in 1997, SARS in 2003 and the 2009 swine flu pandemic among humans. The remarkable 9/11 terrorist attacks have resulted in the implementation of necessary security procedures and technologies in a global scale to prevent future terrorism menaces which in turn contributed to a significant increase in operating costs for airlines. Such security requirements and related costs contributed to substantial cutbacks in airline passenger service quality.

Nevertheless, the sector has a history of strong growth in traffic volumes. Since 1970, when the corresponding number of passengers flown was 383 million, it has grown at an annual average rate of more than 6%. Today, this sector consists of over 2000 airlines operating more than 23,000 aircraft, providing service to over 3700 airports [IATA 2005].

In 2004, the scheduled airline industry generated revenues of nearly $375 billion and an operating profit of $3.3 billion. The passenger traffic jumped 14% overall, being 16% in international service [ICAO 2005].

In the first four months of 2005, the sector already showed a passenger traffic growth of 8.7%. The aggregate operating profit was approximately $4.3 billion in 2005, up 30% over an operating profit of $3.3 billion in 2004, on a 10% rise in revenues to $413 billion [ICAO 2006].

In 2006, the world's airlines flew almost 28 million scheduled flight departures and carried over 2 billion passengers, achieving an operating profit of $13 billion, representing a 2.9%

margin on revenues estimated at $449 billion [IATA 2007]. After the UK terror scare in Heathrow airport in that year, the mishandled baggage became more visible problem due to the inability of airlines and airports to cope with the increase in the volume of checked baggage that resulted from restrictions on fluids in the cabin. The airport charges increased $2.6 billion as a consequence of more strict safety procedures.

In 2008, the global economic downturn propelled by the subprime financial disaster achieved a level never seen since at least the early 1970s followed by a significant increase in fuel prices when the barrel of crude oil reached its peak at $147.30 (United States Department of Energy, 2009) in July. Evidently, these external factors contributed to historic losses by airlines. The total passenger number reached 2.29 billion representing a 0.8% growth only [ICAO 2009]. On the other hand, a decrease of 2.1% in the aircraft movements and 3.7% in total cargo handled by airports were perceived. The 5 fastest growing passenger airports in 2008 were Abu Dhabi (UAE), Istanbul (Turkey), Sharjah (UAE), Sharm El Sheikh (Egypt) and Bahrain [ACI 2009].

The weakness in worldwide air traffic is expected to reach its peak in 2009 with a tiny growth or even a decline compared to 2008, while in 2010 tends to slightly recover if no other unpredictable external factor arises [ICAO 2009].

The future growth of civil aviation industry is uncertain and will depend on the uncertainties in the global geo-political environment and on the frequency and magnitude of those external factors aforementioned such as global epidemic outbreaks and evidences on global financial crisis.

2. Environmental and socio-economic impacts associated with airport operations

No matter which growth performance is expected by civil aviation industry, the sector has already achieved such a high level of passenger traffic and cargo volumes that has raised serious concerns of community members and local or state agencies regarding the associated environmental impacts of airlines and airport operations.

In the context of Sustainable Development, the air transport sector plays an important role and has been increasingly placed in the environmental agenda. The commercial aircraft operate at cruise altitudes of 8 to 13 km, where they release gases and particulates which alter the atmospheric composition and contribute to climate change. Technological progress has been made in reducing greenhouse gas (GHG) emissions, but this cannot compensate for the growth of world air traffic which has been around 50% higher in passengers-km in the last ten years [INNOVATION ENERGY ENVIRONMENT, 2009]. The perceived rapid growth of this sector can turn it into a significant source of greenhouse gas emissions, despite improvements in aircraft fuel efficiency. In the European Union, for example, whilst EU's total emissions controlled under the Kyoto Protocol fell by 5.5% from 1990 to 2003, in the same period greenhouse gas emissions from international aviation increased by 73%, corresponding to an annual growth of 4.3% per year. If the sector continues to grow at the current rate, by 2012 emissions will have increased by 150% since 1990. Although the aviation's share of overall greenhouse gas emissions represents only 3%, the rapid increase observed since 1990 may offset the progress made in other sectors. Particularly, in the EU these increasing emissions would offset more than a quarter of the reductions required by the Community's target under the Kyoto Protocol [COMMISSION OF THE EUROPEAN COMMUNITIES 2005].

It has been observed that the increase in the air passenger traffic has not been followed in the same proportion by investments in the aviation infrastructure, thus causing many

constraints that led to increasing congestion and flight delays, mishandled baggage, and dissatisfied customers due to perceptions of poor service in general.

One of the main suggested alternatives for airports to meet the massive increase in the air passenger traffic has been the expansion of airport operations by building new terminals and runways. However, this alternative solution may result in the increase in large scale of environmental impacts such as those presented in tab. 1.

Tab. 1 - Main environmental aspects and impacts associated with airport operations and expansion

Environmental Aspect	Environmental Impact
Water consumption	Degradation of human health, ecosystem quality and natural resources
Energy and fuel consumption	Air pollution, global warming
Emissions of CO_2	Global warming
Emissions of VOC	Photochemical smog (increase in ground level ozone)
Emissions of NO_x and SO_x	Acidification and eutrophication
Waste generation	Odour (if applicable), global warming (if biodegradable), air pollution (if incinerated), aesthetical/visual impact, degradation of human health and ecosystem (if improperly disposed off).
Waste water (nitrates, phosphates)	Acidification and eutrophication, degradation of aquatic habitat, soil and groundwater contamination
Heavy metals (Cr, Cd, Ni, Cu, Pb)	Health diseases and soil degradation
Noise generation	Degradation of human health and the biota in the surroundings
Light disturbance	Visual impact on the surrounding community and disturbance of local biota, mainly birds.

Note: CO_2 – carbon dioxide; VOC – volatile organic compound; NO_x – nitrogen oxides; (N_2O) - nitrous oxide; SO_x – sulfur oxides.

Own source

In some countries, the voices of important stakeholders have led to the delay and even cancellation of some airport expansion projects. To address these concerns, airports may be required to implement projects that would minimize the environmental impacts of their operations. An alternative to runway expansion is to cap the existing facilities and shift the short-haul traffic to alternate modes such as train or automobile.

The improvement of national high-speed networks observed in some European countries has been allowing trains to challenge airlines on shorter trips. Examples are illustrated by the Eurostar service between London and Paris, the high-speed rail link between Madrid and Barcelona, and also the high-speed railroads Paris-Lyon, Paris-Brussels and Hamburg-Berlin. Such transport links offered by railroad industry resulted in the reduction of services provided by airlines for these routes. The upcoming deregulation of European railroad industry to be enforced in December 2009 will extend the range of market share of railroad industry for short

routes, thus causing an additional deceleration in the growth scale of airport and airlines operations [CRUMLEY 2009].

On the other hand, as illustrated in tab. 2, the airport sector has some positive social and economic impacts which can be translated into job generation, business efficiency enhancement and tourism development. Thus, restricting airport capacity or pricing off air travel demand could have severe economic or social consequences. Studies suggest that failure to increase capacity to meet demand could **reduce GDP at a national or regional level by 2.5 to 3%,** taking all impacts into account, although this will be heavily dependent upon the level of restriction applied [ACI EUROPE 2004].

Tab. 2 - Key contribution of the European airport sector for the regional and national economic development

Key socio-economic contributions for the regional and national economic development
• Airports support employment directly on-site and in the surrounding area but also indirectly in the chain of suppliers providing goods and services. In addition, the incomes earned in these direct and indirect activities generate demand for goods and services in the economy, which supports further employment.
• Nearly two-thirds (64%) of employment comes from airlines, handling agents and aircraft maintenance, with the remainder split between airport operators (14%), in-flight catering, restaurants and bars and retailing (12%), air traffic control and control agencies (6%), freight (1%) and other activities such as fuel companies and ground transport operators (3%).
• The European airports on average support around **950 on-site jobs per million passengers (workload units)** per annum currently.
• For every 1,000 on-site jobs supported by European airports there are around 2,100 indirect/induced jobs supported nationally, 1,100 indirect/induced jobs supported regionally, or 500 indirect/induced jobs supported sub-regionally.
• **Given that there are 950 on-site jobs created per million passengers, it can be concluded that for every million passengers (workload units), European airports support around 2,950 jobs nationally, 2,000 jobs regionally, or 1,425 jobs sub-regionally.**
• Airports can make a substantial contribution to the overall economy of the areas that they serve, when the combined effect of their direct, indirect and induced impact is taken into account. Estimates vary in the range 1.4 - 2.5% of GDP, excluding tourism impacts.

Source: ACI, 2004

Due to the significant socio-economic and environmental impacts inherent to their operations, airports worldwide are increasingly being managed within the framework of sustainable development guiding principles mainly as a response to the pressure received by their various stakeholders. The *World Commission on Environment and Development* defined sustainable development in 1987 in the Brundtland Report as *"meeting the needs of the present without compromising the ability of future generations to meet their own needs"*. This new paradigm is reinforced by the "Triple Bottom Line" (TBL) approach, a term also known as "*people, profit, planet*" [Elkington 1994]. This concept according to Elkington means that

"for an organization to be sustainable – a long run perspective –, it must be financially secure, it must minimize (or ideally eliminate) its negative environmental impacts and, finally, it must act in conformity with societal expectations".

There is consensus nowadays that socially responsible business means going beyond compliance with relevant legislation and continuously investing into human capital, environmental protection and relations with stakeholders. However, the way organizations translate these concepts into practice vary according the location of the enterprise due to differences in the legislative framework between countries, the core competencies and resources available, the stakeholders' interests and the cultural traditions.

The measurement of sustainability performance requires the definition of goals and criteria by business managers in a communicative interaction with stakeholders in order to measure, to manage and to report on the indicators and issues which are key to stakeholders and the business success [Schaltegger and Wagner 2006].

Four European airports (Athens, Frankfurt, Munich and Amsterdam) have been making genuine progress as leaders in the sector towards environmental sustainability as it can be shown through their respective sustainability reports issued on annual basis. These reports have been elaborated based mainly on the sustainability reporting guidelines provided by US-based non-profit organization *Global Reporting Initiative* (GRI). A report based on GRI guidelines usually addresses the concerns and expectations of all stakeholders. In the airport sector, the stakeholders are: investors, employees, passengers, industry associations, airline companies, local authorities, journalists and local communities. However, a customized set of reporting indicators specifically conceived for airports is still on the way to be published in a multi-stakeholder process in cooperation with GRI.

The main purpose of these GRI indicators is to improve the effectiveness in managing, measuring and communicating on the impacts of airport operations on the natural and social environment which in turn will ensure the prosperity of the business in a long-term.

Sustainability reports based on the GRI reporting guidelines enable users to compare company performance, and have been used in other sectors as more than a communications platform but also a management tool for the integration of sustainability strategies into overall business processes. The airport industry becomes the latest segment of the global transportation infrastructure to take up the sustainability challenge behind others such as logistics and automotive which have already worked with GRI to create sector specific reporting guidance [GRI 2007].

3. The conventional assessment of airports in terms of passenger expectations

A London-based airline and airport passenger research firm named Skytrax has been aligned with the rapid growth of this sector and has been releasing since 1999 a world ranking of best airports based on the results gathered annually from passenger surveys conducted about more than 190 airports worldwide. The questionnaire evaluates traveller experiences across 39 different airport service and product factors - from check-in, arrivals, and transfer through to departure at the gate [Skytrax World Airport Awards 2009]. The evaluation methodology proposed by Skytrax has been shown very consistent based on the perspectives of the customers, i.e., the passengers. The tab.3 specifies these customer-driven indicators.

In June 2009, Skytrax released the newest ranking with the world's top 10 airports according to the aforementioned customer-driven criteria. The best airports according to the passenger perspective are listed on tab.4.

The Airports Council International (ACI) has also been measuring the levels of service delivered by airports worldwide through its benchmarking programme named Airport Service Quality (AQS). The evaluation is a result of a series of observations, precisely scheduled to ensure an accurate reflection of key issues throughout the airport during peak hours.

The survey captures the passengers' perception of the quality of more than 30 aspects of service that they have experienced at the airport. Interviewing covers every day of the week and every month of the year to ensure coverage of all seasons and all peaks and troughs.

Tab. 3 – List of customer-driven indicators adopted by Skytrax to evaluate airports worldwide

1	Getting to & from Airport / Accessibility	21	Language skills for Airport Staff
2	Public transportation options	22	Ease of Transit thru Airport (between flights)
3	Taxi availability / prices	23	Location of Airline Lounges
4	Availability of luggage trolleys (airside & landside)	24	Washroom / Shower facilities
5	Terminal comfort, ambience & general design / appearance	25	Cleanliness of Washroom facilities
6	Terminal cleanliness	26	TV / Entertainment facilities
7	Seating facilities throughout terminal(s)	27	Quiet areas / Day rooms / Rest areas
8	Immigration - queuing times (departure / arrivals)	28	Children's play area / facilities
9	Immigration - staff attitude (departure / arrivals)	29	Choice of Shopping
10	Waiting times - at Security	30	Prices charged in retail outlets
11	Courtesy & Attitude of Security staff	31	Choice of bars / cafes & restaurants
12	Check-In facilities	32	Prices charged in bars / cafes & restaurants
13	Terminal signage	33	Internet facilities / WiFi availability
14	Clarity of Boarding Calls / Airport PA's	34	Business centre
15	Flight Information Screens - clarity / information	35	Telephone / fax locations
16	Friendliness of Airport Staff	36	Bureau de change facilities
17	ATM facilities	37	Smoking policy / Smoking lounges
18	Standards of disabled persons access / facilities	38	Baggage Delivery times
19	Priority Baggage Delivery efficiency	39	Baggage Delivery - efficiency / lost luggage
20	Perception of airport security / safety standards		

Source: Skytrax, 2009

Tab. 4 – World's top 10 airports according to Skytrax criteria on service and product factors

Position	Airport name	Location
1	Incheon International Airport	Seoul, South Korea
2	Hong Kong International Airport	Hong Kong, China
3	Singapore Changi International Airport	Changi, Singapore
4	Zurich International Airport	Zurich, Switzerland
5	Munich International Airport	Munich, Germany
6	Kansai International Airport	Osaka, Japan
7	Kuala Lumpur International Airport	Kuala Lumpur, Malaysia
8	Amsterdam Airport Schiphol	Amsterdam, Netherlands
9	Centrair Nagoya Airport	Nagoya, Japan
10	Auckland International Airport	Auckland, New Zealand

Source: Skytrax, 2009

The performance measured by ASQ allows airport management to measure the service performance actually delivered by the airport and accurately pinpoint underperformance, bottlenecks and over-performance.

The methodology adopted by ACI is based on 16 key performance indicators (KPIs) which define the passenger experience through the airport. Some examples of KPIs are:

- Waiting time at check-in
- Waiting time at security
- Number of baggage carts available
- Waiting time at immigration

The tab. 5 shows the top 5 airports worldwide which were announced by ACI in March 2009.

Tab. 5 – World's top 5 airports according to AQS methodology

Position	Airport name	Location
1	Incheon International Airport	Seoul, South Korea
2	Singapore Changi International Airport	Changi, Singapore
3	Hong Kong International Airport	Hong Kong, China
4	Centrair Nagoya Airport	Nagoya, Japan
5	Halifax Stanfield International Airport	Halifax, Canada

Source: ACI, 2009

Interestingly, the top 3 airports of both rankings are the same, although the Singapore airport has shifted up one position on the ACI list. The Centrair Nagoya airport comes on the 4th position on the ACI list while on the Skytrax ranking it is on the 9th position. Curiously, Halifax Stanfield International airport appears on the 5th position of ACI list but is not among the top 10 list of Skytrax.

In case other important categories of stakeholders have to be considered, other types of indicators will have to be added. For example, for shareholders, indicators such as labour

productivity (in terms of passenger per employee, aircraft movement per employee or workload unit per employee), terminal productivity measures (in terms of passenger per gate or passenger per square meter terminal area), runway productivity (in terms of aircraft movement per runway) and financial results (in terms of total revenue per passenger, revenue per employee or revenue per movement) might be convenient for comparison [ATRS 2007].

Within the context of sustainability performance, the extent of indicators shall go far beyond by including other types of qualitative and quantitative measurements which are also important for the local authorities, local communities, employees, airline companies and various service providers and suppliers (bar, restaurants, fuel transport, ground transport operators, etc).

When the airport management decides to install automated systems to facilitate the passenger traffic flow, it is also doing aimed at cost reduction. In some airports such as La Guardia (New York), most of terminals are operated directly by airlines which in turn reduce the need for more number of employees. In one aspect, it can be expected that the employees of airlines will work more efficiently at the boarding time which can bring benefits for the customers and shareholders. On the other hand, there is a loss of permanent local employment might not be a good aspect for the local communities and local authorities.

4. The performance of airports within the context of sustainability

As previously mentioned, a specific set of sustainability indicators is being developed by GRI for the airport sector which is expected to be used as a sector supplement for the G3 general guidelines firstly issued in 2000.

Recently, GRI analyzed a sample of sustainability reports from 17 airports for the year 2007. Based on this observation, it was possible to capture the most common indicators used in this sector for sustainability reporting. Some of the indicators identified are covered by GRI G3 Guidelines whilst others are sector-specific themes. In that year, only few airports issued sustainability reports and a handful of them did it based on the G3 Guidelines.

The tab.6, tab.7 and tab.8 highlight these airport sector themes commonly identified by GRI and the Triple Bottom Line dimension (economic, social or environmental) to which they belong as well as the main targeted stakeholder by each of them.

Tab. 6 – Main Environmental themes covered by sustainability reports in the airport sector

Sector Theme	Examples of information	TBL dimension	Targeted stakeholder
Air Quality	Clean indoor air quality, monitoring concentrations and measures to reduce emissions of greenhouse gases, ozone-depleting substances and air pollutants.	Environmental	Society and Government
Energy	Description of the management measures taken to ensure conservation of as much energy as possible. Quantitative information on total energy consumption per traffic unit. Production and distribution of renewable energy.	Environmental	Society and Government
Solid Waste Reduction and Recycling	Amounts of non-hazardous industrial waste collected at the airport facilities and recovered. Overview on the disposal methods and major recycling initiatives, among other themes.	Environmental	Society and Government
Noise Abatement	Number of people and the area affected by noise, as well as noise decibel levels around the airports. Information on the number of noise complaints the airport has received per year.	Environmental	Society and Government
Green Initiatives, Buildings and Facilities	Actions taken with the aim of being in general, environmentally friendly (e.g., light-saving mechanisms, recycling activities within offices, "green" purchasing).	Environmental	Society and Employees
Water Conservation and Management	Estimates of volumes of water consumed per year. Description of water conservation initiatives (e.g., treatment of waste water and "storm water").	Environmental	Society and Government
Hydrocarbon spills	Detailed numerical information on hydrocarbon spills (e.g., graphs showing the causes of spills, number of spills in liters per 1,000 movements and number of spills that went into the environment).	Environmental	Society and Government
Environmental Communication	Commitment to engaging in environmental communication with various stakeholders in all applicable and relevant issues about the environment.	Environmental	All
Climate Change	Initiatives to reduce greenhouse gas emissions (estimated CO_2 emissions per passenger on annual basis).	Environmental	Society and Government
Natural Resources Management	Activities carried out to protect habitats, endangered species and the soil.	Environmental	Society and Government

Source: GRI, 2009

Tab. 7 – Main Social themes covered by sustainability reports in the airport sector

Sector Theme	Examples of information	TBL dimension	Targeted stakeholder
Health and Safety	Tightening security for passengers and employees. Quantitative measures of various types of injuries.	Social	Employees and Customers
Community Investment and Development	Continued and Increased communication and collaboration with the community. Amount of resources invested in community activities (e.g., sponsorships and donations for the local community). Provision of detail about employee volunteering programme.	Social	Society, Government and Employees
Customer Care	Quality of airport responses to enquiries from customers, provisions of customer service training	Social	Customers
Labour/Sustainable and Human Resources	Information on training and professional development of employees, breakdown of demographics (% of women, minorities, and disabled persons employed). Notes on future benefits and incomes of employees.	Social	Employees
Surface Access/Transportation	Implemented measures to make the use of public transport a more convenient choice for those travelling to and from the airport. Measurement of such initiatives (e.g., overall annual public transport mode share and transport mode used by passengers and staff by year).	Social	Customers and Employees

Source: GRI, 2009

Tab. 8 – Main Economic themes covered by sustainability reports in the airport sector

Sector Theme	Examples of information	TBL dimension	Targeted stakeholder
Traffic/Operational Figures	Information on the number of takeoffs and landings, passenger volumes.	Economic	Investors
Income-Generation and Distribution	Information on how much income is generated and from which sources the generated income came from. Detail on the distribution and purpose for which the income was spent (e.g., community investment, renovations, airport expansion etc). Contribution in Direct Gross Domestic Product (value added) to the region in which the airport is based.	Economic	Investors and Government
Sourcing/Supply Chain	Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation. Initiatives to only purchase from "green" suppliers and to provide "sustainable" services and products to customers.	Economic	Supplier
Airport Expansion/Construction	Information on new runways being constructed and additional terminals being built.	Economic	Investors, Society and Government

Source: GRI, 2009

The sector themes identified by GRI provide a guideline for airports worldwide on which indicators shall be of importance for sustainability reporting. However, it is important to emphasize that these indicators alone do not provide the necessary data for a real evaluation of the level of sustainability of an airport. For achieving such a challenging objective, it is recommended to go beyond and evaluate if the airport in analysis has shown progress in the quantifiable indicators in the past few years. Examples of such improvements can be illustrated by:

On **environmental issues**: a measured reduction in water and energy consumption per person (including passengers and employees), in noise generation, in the emissions of air pollutants (per aircraft movement and per passenger), etc.

On **social issues**: reduction in the incidence of accidents and injuries at work per year, reduction in the number of complaints per year by customers and local citizens, increase in the share of public transport used to/from the airport by passengers and employees, increase in the number of employment and in the level of salaries per year, increase in the investment on employee training and development per year, etc.

On **economic issues**: increase on revenues per passenger and revenues per employee, increase on dividend payouts for shareholders, decrease of fines per year for incidents of non-compliance with local regulations, increase in passenger traffic and aircraft movements, etc.

Additionally, the passenger-driven indicators such as those used by Skytrax and ACI can be embedded together with these identified by GRI into one-only wide sustainability assessment framework. A recent attempt based on this idea has been made for the airlines sector in which several indicators were measured and grouped according the expectations of stakeholders such as shareholders, employees, customers, suppliers, government and the society [Costa Jordao, Ben Rhouma 2009].

This paper gives a closer view on the top 5 airports listed by Skytrax and investigate the extent to which these acclaimed "best airports" address the sustainability issues highlighted by GRI.

A preliminary analysis on the level of reporting coverage on sustainability issues gave an idea of the follow-up results. The tab.9 shows the level of Sustainability Reporting coverage in their airports taking in consideration the following report score criteria:

Level 1: No information on sustainability issues is available on reports neither on website

Level 2: There is information related to sustainability issues only on website and is not updated

Level 3: There is no updated exclusive sustainability report but these issues are included in the Annual Report

Level 4: There is an updated exclusive sustainability report available but it is not based on GRI guidelines

Level 5: There is an exclusive sustainability report available and it is based on GRI guidelines

The tab.9 shows that only four of those listed airports are issuing a separate Corporate Social Responsibility/Sustainability report. Three of those airports do not provide information on sustainability issues neither on their annual report. Finally, only one airport (Amsterdam) among those listed is currently issuing a sustainability report based on GRI G3 guidelines. That

means, a long pathway is still expected to be done in this sector when it means reporting on sustainability issues. Hopefully, after the publication of the sector supplement for the airport sector by GRI more airports will follow the Amsterdam Schiphol Airport on their sustainable attitude.

Tab. 9 – Level of sustainability reporting coverage by top 10 airports listed by Skytrax

Airport	Sustainability reporting coverage	Country	Region
Incheon International Airport	4	South Korea	Asia
Hong Kong International Airport	3	China	Asia
Singapore Changi International Airport	2	Singapore	Asia
Zurich International Airport	4	Switzerland	Europe
Munich International Airport	4	Germany	Europe
Kansai International Airport	2	Japan	Asia
Kuala Lumpur International Airport	3	Malaysia	Asia
Amsterdam Airport Schiphol	5	Netherlands	Europe
Centrair Nagoya Airport	2	Japan	Asia
Auckland International Airport	3	New Zealand	Oceania

Source: Annual Reports, Sustainability Reports and websites of analyzed airports

The tab. 10 presents the scores obtained by each of those top 5 airports in all Triple Bottom Line (TBL) themes identified by GRI. An average score is shown for each airport in each dimension (environmental, social and economic). The following criterion was adopted for the score assignment:

1 point – when no information related to that theme was reported.

2 points – when the information related to that theme was reported only on qualitative or on quantitative way.

3 points – when the information related to that theme was reported on both qualitative and quantitative ways.

It can be noted that the best airport on environmental reporting according to GRI themes is the Zurich International Airport whilst the Incheon International Airport has shown the best reporting coverage on social and economic themes. Actually, this airport has also shown a high level of equilibrium on the information among the sustainability themes. On the other hand, the Singapore Changi International Airport has demonstrated a low concern regarding the reporting on sustainability themes, mainly on the environmental and social ones. It does not mean, however, that in practice, the airport is not performing well on these issues. Instead, it may transmit a lack of transparency for the stakeholders once the information related to all these important themes is currently not publicly available.

Based on these closer observations interlinked with the level of sustainability reporting coverage shown in tab.9, it can be expected that Kansai International airport and Centrair Nagoya airport will rather follow the same trend of Singapore International Airport. It can be also foreseen that Amsterdam Airport Schiphol will rate high on all these sector themes once it is the only airport in the list that is currently issuing a sustainability report based on GRI G3 guidelines.

At present time, the following airports are currently issuing sustainability reports according to GRI G3 guidelines: Athens International airport, Schiphol airport and those managed by AENA (several airports in Spain) and *Aeroports de Paris* (airports such as Charles de Gaule and Orly).

Tab. 10 – Quality of sustainability reporting by top 5 airports listed by Skytrax

TBL Dimension	Sector Theme	Airport Name				
		ICN	HKG	SIN	ZRH	MUC
		Score	Score	Score	Score	Score
ENV	Air Quality	3	2	1	3	3
	Energy	3	3	2	3	3
	Solid Waste Reduction and Recycling	3	3	2	3	3
	Noise Abatement	3	2	1	3	3
	Green Initiatives, Buildings and Facilities	3	3	2	3	3
	Water Conservation and Management	3	3	2	3	3
	Hydrocarbon spills	2	1	1	3	2
	Environmental Communication	2	2	1	3	2
	Climate Change	3	2	1	2	2
	Natural Resources Management	3	3	1	3	3
Average Environmental Reporting Score		**2.8**	**2.4**	**1.4**	**2.9**	**2.7**
SOC	Health and Safety	3	3	1	3	2
	Community Investment and Development	3	3	2	1	2
	Customer Care	3	3	1	1	1
	Labour/Sustainable and Human Resources	3	2	1	3	2
	Surface Access/Transportation	2	2	2	3	3
Average Social Reporting Score		**2.8**	**2.6**	**1.4**	**2.2**	**2.0**
ECO	Traffic/Operational Figures	3	3	3	3	3
	Income-Generation and Distribution	3	1	1	2	1
	Sourcing/Supply Chain	2	2	1	2	2
	Airport Expansion/Construction	3	3	2	3	2
Average Economic Reporting Score		**2.8**	**2.3**	**1.8**	**2.5**	**2.0**

Source: Annual Reports, Sustainability Reports and websites of analyzed airports

5. Conclusions and suggestions for future research

The present study shows that the "best airports" in the world can vary significantly according to the perspective analyzed. An airport that performs very well in relation to passenger expectations might not perform in a satisfactory way when analyzed upon other perspectives such as those of employees, suppliers, local communities and local authorities.

There is an emerging need nowadays of addressing the expectations of all stakeholders in the decision-making process of every business. The situation is the same for the airport sector. Therefore, a careful sustainability reporting based on the upcoming GRI sector-specific set of indicators is recommended to be widely adopted in the airport sector. Simultaneously, if a true

ranking of best airports upon the sustainability perspective is foreseen, proposed tools based on the GRI G3 guidelines and other stakeholder-specific indicators such as those used by Skytrax and ACI are not only welcomed but necessary.

It is expected that when a sustainability performance ranking for the airport sector will be created, more airports will join their efforts to address the sustainability themes in their reports and to improve on the correlated indicators on a yearly basis because such rankings will bring legitimacy for the airports in front of their main stakeholders. Among other positive consequences, an increase on investment capital from shareholders may accrue due to the fact that investors will know better how the airport management is using the financial resources and how is managing all risks related to their operations.

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