



Indicator Information Sheet

Subject:	Air Transport Development
Kind of indicator:	Sustainable Development Indicator
Spatial objective:	Worldwide
Object:	Effects of Air Transport on the Social Development
Themes:	Air Transport related Mobility Trends

1. Purpose of the indicator category

The general purpose of the indicator category 5 “Effects of Air Transport on the Social Development” is to discuss the relation between the air transport sector and the external framework with regard to the social impacts of air transport activities. This refers to the underlying question which contribution the air transport sector offers with regard to mobility and general needs of society and includes such important aspects as safety, connectivity (travel time, network composition, etc.) and the comfort of passengers among other issues. As a result, the discussed topics, which are summed up in the given category, are very manifold and include perspectives of different stakeholders and different parts of society. This complexity makes it necessary that the chosen indicators – as far as they belong to different thematic dimensions as it is indicated in the headline of this sheet – will also be discussed in separate indicator information sheets. The beginning will in this context be marked by safety aspects and mobility issues. For each of these topics a single indicator information sheet was prepared. Nevertheless, it is thinkable that the presented indicator set will be extended in the near future according to changing society needs, although safety and mobility aspects are core elements of the topic discussed here.

The main purpose of air transport is to bring passengers and goods - mostly on long distances - from one point to another. Although, the share of the air transport mode in the whole transport market is in terms of volume relatively small, in most cases air transport has an important function for its users. When considering the air freight market, for example, special goods – like food or medicine – have a limited life time and it is essential to rely on air transport services in this context in order to guarantee a quick exchange of these products. In passenger transportation, air transport services play a similar important role e.g. with regard to business purposes in order to manage foreign trade or in the field of ethical traffic. This way, air transport services support also intercultural exchange. That is why the analysis of mobility trends represents an indispensable component in the set of the given SDIs with regard to the social effects of air transport.

2. Description of the indicator development

In the following, three indicators with regard to air transport related mobility trends are described:

1. Departures per inhabitant

One measure to analyse the air transport supply level on a global scale is to put the number of departures in context to the global population. Combining these measures, it has to be considered that the global population mainly grows in developing regions, where air transport services are currently only used by a very small share of inhabitants. On the other side, the air transport supply rose in the last decades mainly in regions with high



welfare level and with stagnating population numbers. Therefore, the interpretation of the indicator development has to be done very carefully and on a world region level in order to address these conditions.

2. Passengers per 1,000 inhabitants

Besides the relation of air transport supply and population development, the inhabitant specific air transport demand development could be of interest to show the interchanges of air transport and the social dimension. It has to be taken care when interpreting results against the share of population, which participates in air transport. If a high level of passengers is reached per 1,000 inhabitants in one world region this does not automatically mean that many people in this region participate in air transport activities. In fact, it could also be the case that a small share of the population flies regularly with a higher intensity than in another world region and is solely responsible for a peak with regard to the indicator development. Thus, it has to be taken care when analysing air transport activities in the context of social sustainability and social justice.

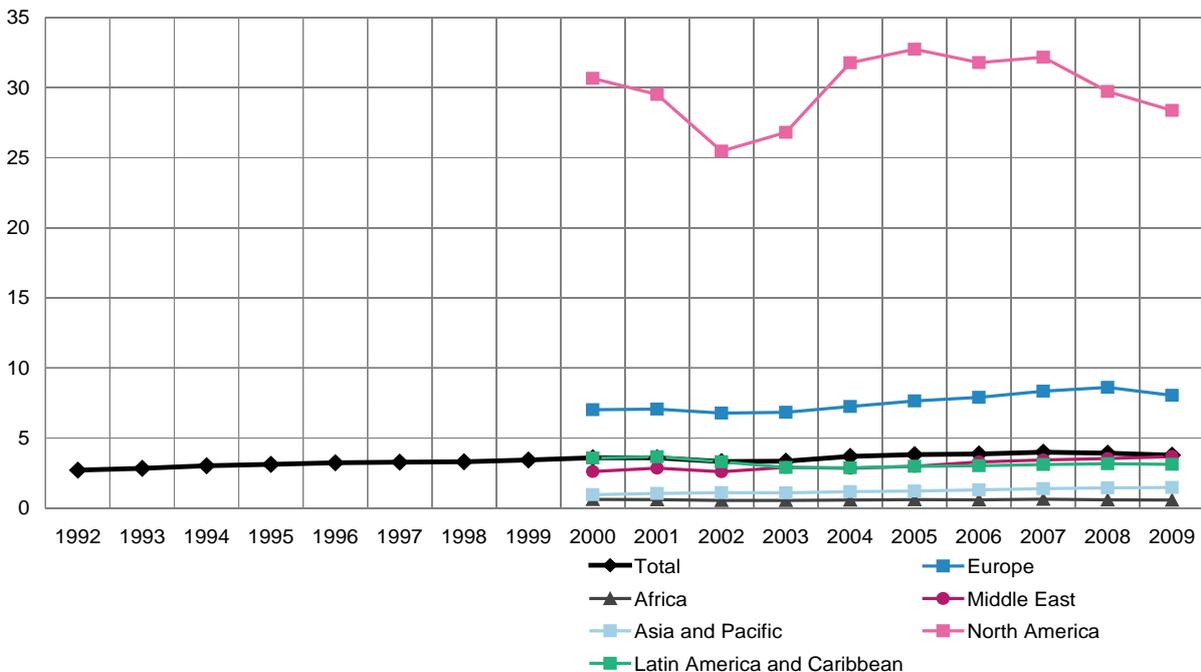
3. Passengers per million US\$

A little change in the perspective compared to the last mentioned indicator but a similar theme discusses the GDP specific air transport demand volume development. Within this context, the relation between the welfare level of a world region and the impact on the air transport demand side is investigated. The indicator is able to show how air transport demand in terms of passengers develops in dependence from GDP.

Indicator 1: Departures per 1,000 inhabitants

Source: Own calculations based on ICAO, UN.

Departures per 1,000 inhabitants



On a global scale, the total number of worldwide departures rose by 75% from 14.8 million to 25.9 million between 1992 and 2009. At the same time the global population grew from 5.5 billion to 6.8 billion people. This means an increase of about 24%.



Corresponding to these figures, Indicator 1 presents the development of the number of departures per 1,000 inhabitants on a global and world region level. For the time span between 1992 and 2009, aggregated world level data was available. Meanwhile, the monitoring for the separate world regions starts – due to data gaps – with the year 2000.

Concerning the worldwide development of departures per 1,000 inhabitants, the timeline shows a moderate but continuous rise of the indicator from 2.7 departures to 3.8 departures (+ about 41%) between the regarded 17 years-time span. Comparing this development with the European one in the years from 2000 to 2009, it can be seen that the air transport sector in Europe grew strongly in the last decade with regard to the evidence from the chosen indicator but this must mainly be seen in dependence from a nearly stagnating population development. The developments in this region as well as those in other regions have therefore to be analysed carefully and by using a differentiating point of view.

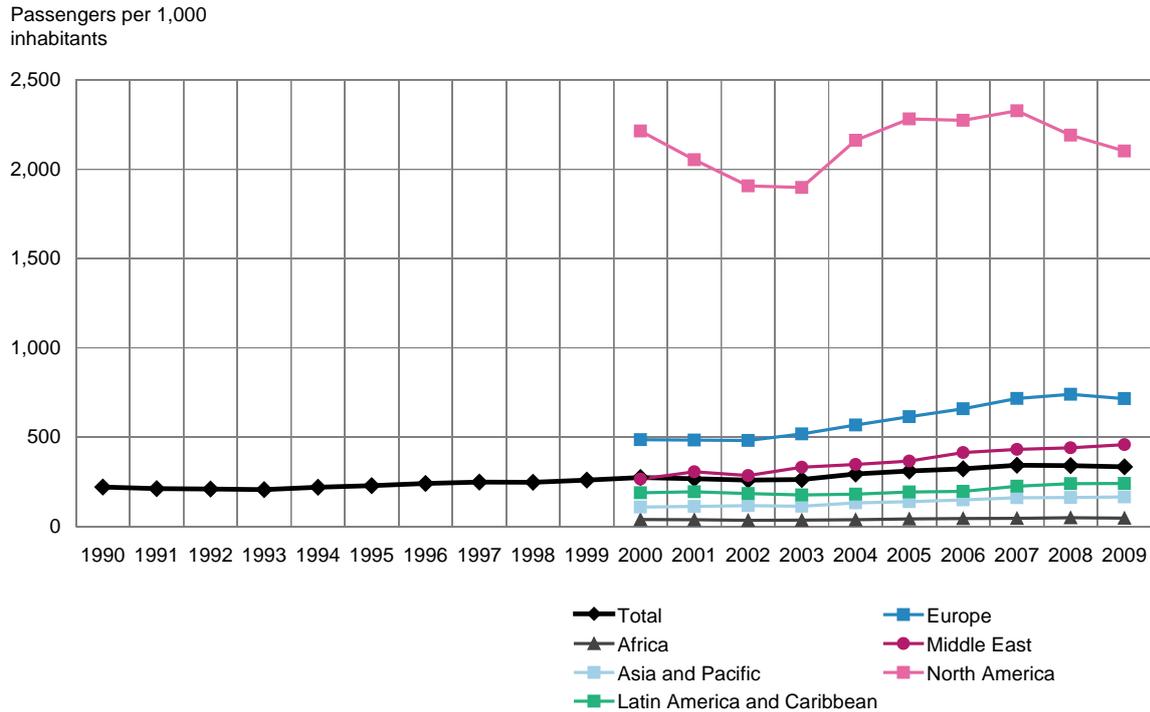
Looking further at the graph, it is obvious that North America shows the most clear over average growth of departures per 1,000 inhabitants. This market in the air transport system can already be characterised by saturation. Changes in the specific movement performance can mainly be explained as a result of the economic development in this region. Meanwhile, in Europe there was a slight population increase by 2.6% between 2000 to 2009 while the air transport supply in terms of departures increased by more than 17% at the same time. The population specific flight offer grew accordingly by 14.6%. This corresponds to a rise from 7 departures per 1,000 inhabitants to 8.1 departures per 1,000 inhabitants.

Regarding Latin America and the Caribbean region, a completely different trend is visible. The population increased by 12.9% within the regarded time period. On the other hand, the air transport supply in terms of departures declined slightly by 2.5%. The population specific air transport offer decreased accordingly from 3.6 departures per 1,000 inhabitants to 3.1 departures per 1,000 inhabitants.



Indicator 2: Passengers per 1,000 inhabitants

Source: Own calculations based on ICAO, UN.



Indicator 2 shows the population specific air traffic performance for the whole world concerning the years 1990 to 2009. Starting in the year 2000, also six world regions according to the ICAO classification are regarded in addition. In total, for the global level it can be concluded that in the year 1990 220 passengers per 1,000 inhabitants were recorded. This value rose to 334 passengers till the year 2009, which represents an increase of 51%. As already mentioned before, the global population grew in the same time span by 26.5%.

By analysing the world regions separately, the clear above average rise of the number of passengers per 1,000 inhabitants in North America catches the strongest attention. This corresponds to the development described by the previous indicator (Indicator 1). In this case, the number of flights per capita fluctuated between 1.9 and 2.4 but was also significantly over the average level by taking into account the other world regions. Even when considering that the in North America registered overall number of passengers includes a share of passengers which came originally from other regions, it can be assumed that the population specific air transport intensity there is higher than in other regions of the world.

Also in Europe a similar over average passenger and flight intensity per capita is noticeable, but in contrast to North America this involves a steady and not fluctuating growth trend line with exception of the year 2009. In general, these similarities in growth can be explained most probably by the fact that both world regions have high transport intensities, and accordingly, well established and big networks of air transport connections developed there over the years. This led to a corresponding demand increase.

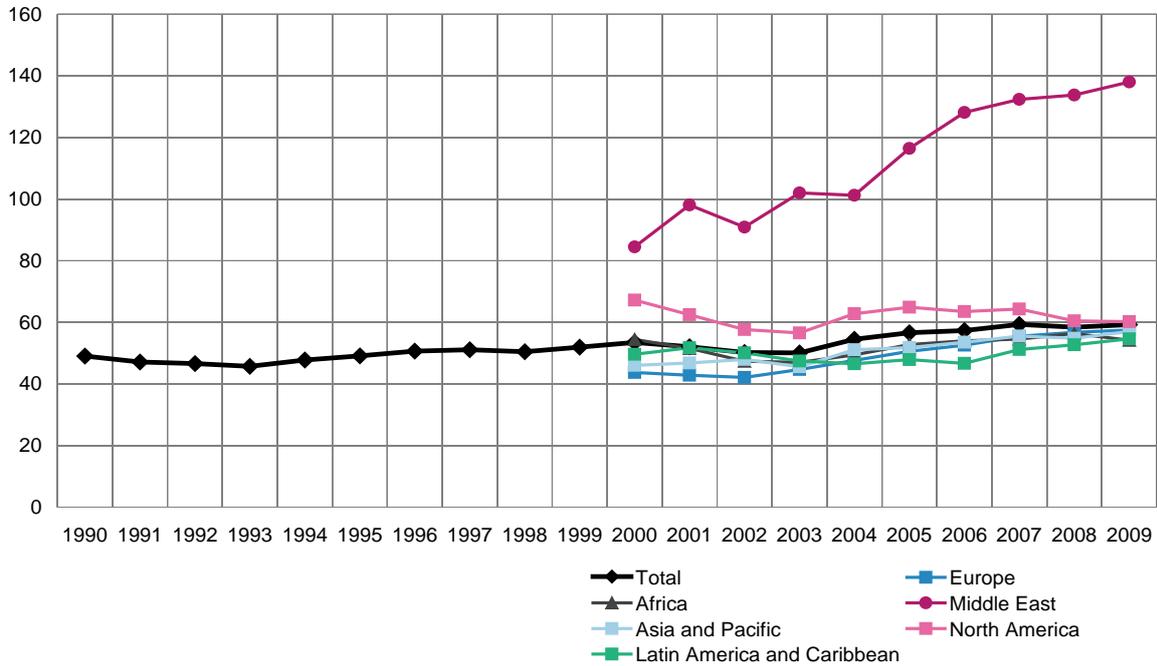
The Middle East region can be characterised by another indicator development. In 2000, this part of the world still showed only an average flight intensity but the further years brought a disproportionate growth, reflected in the terms of passengers per 1,000 inhabitants. The rising number of transit passengers which use the growing hubs in the Middle East has surely contributed to this status. Looking further at the graph for the regions Asia/Pacific and Latin America/Caribbean, only a small growth with regard to the presented indicator is visible. More or less the same holds for Africa where even a kind of stagnation, as it is also given by the previous indicator (Indicator 1), can be seen.



Indicator 3: Passengers per million US\$

Source: Own calculations based on ICAO, World Bank WDI.

Passengers per million US\$ (2000 constant)



A third indicator, which is able to describe the relation between air transport and the social development, is the number of passengers in dependence on the economic productivity expressed in GDP development. Within this context, the GDP development can serve as indicator for the socio-economic development within a population group. In reference to this, the global air transport performance, measured by the number of passengers per 1 million US\$ GDP, rose between 1990 and 2009 from 49 to 59 passengers. This represents an increase of 20% for the regarded time span.

Very interesting results derives also a view on the world regional level concerning this indicator. While the indicator values for all regions differ stronger at the beginning of the observation, up to 2009 almost all corresponding curves show a clear convergence with the global average level. The only exception is the Middle East region. The value of passengers per 1 million US\$ GDP, which was already in 2000 significantly above average, reached a remarkable peak in 2009 with 138 passengers per 1 million US\$ GDP. This development can be explained by an extraordinary growth of air transport services in comparison to other business sectors in the regarded region.



3. Main sources of the discussed indicators

- ICAO: ICAO data portal (aggregated data series)
- United Nations Population Division: World Population Prospects, the 2010 Revision (WPP2010), requested on <http://geodata.grid.unep.ch>
- The World Bank: World Development Indicators (WDI), requested on <http://geodata.grid.unep.ch>

4. Alternative sources to build similar indicators in the given indicator field

- IATA: World Air Transport Statistics

This Indicator Information Sheet was prepared by the MONITOR project partner DLR – Institute of Air Transport and Airport Research.

Date of release: Nov 25, 2011