

Domestic and International Tourism in a Globalized World

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Abstract

The tourism sector and tourism research community focus mainly on international in- and outbound tourism volumes and expenditures. But international tourism is only one part and certainly in number of arrivals, domestic tourism is several times larger than international. However, consistent data on world-wide domestic tourism are not so readily available.

This paper therefore first focuses the development of domestic visitor numbers over time per country. These numbers will be compared to the international inbound and outbound visitor numbers per country. An international comparison will be included as well.

The next step will be the recognition of the economic importance of domestic compared to international tourism. The respective environmental impacts with a specific focus on GHG emissions of domestic compared to international tourism will be subject of our research as well. To conclude, we recommend an alternative, more accurate metric than border crossings to distinguish between domestic and international tourism

The ignorance of domestic tourism

The tourism sector and tourism research community focus mainly on international in- and outbound tourism volumes and expenditures. Statistics on international tourism as reported by among others the UNWTO are more or less consistent, comprehensive and up-to-date. But international tourism is only one part and certainly in number of arrivals, domestic tourism is several times larger than international. Most US tourists never leave their country and their numbers are far bigger than for instance the Germans. The number of domestic tourists within China exceeds that of all international inbound tourists and shows also an even larger growth. (WTTC 2006a, National Bureau of Statistics of China 2007), However, consistent data on world-wide domestic tourism are not so readily available. As an illustration: the latest UNWTO World Tourism Barometer of October 2008 is all about in- and outbound international tourism growth forecasts without even mentioning the domestic tourism component once (UNWTO 2008).

Whereas international tourism movements are hard to measure, domestic tourist movements are even harder to track.

Domestic tourism throughout the world is a predominant but invisible portion of total tourism activity. The lack of commonly accepted and/or used definitions of domestic travel activity is largely responsible for this ignorance. Available domestic tourism data are mostly in the form of number of trips to destinations beyond a certain minimum distance from the normal place of residence, and involving at least one overnight stay. Other data include same-day visitors. And in case no such data format is available researchers resort to either the number of registered guests in hotels, etc. or the ratio between the number of overnight stays and the average length of stay. The latter formats underestimate domestic tourism by excluding VFR trips (Bigano *et al.* 2004). Other data include same-day visitors.

A recent UNWTO study (UNWTO-UNEP-WMO 2008) roughly estimated that in 2005 of the total number of tourists some 750 million were international and 4,000 million domestic. Of the latter almost half takes place in developing countries, the other half in developed (the IPCC OECD90) countries.

This one-sided focus on international tourism may be caused by, among others, the practical fact that boundaries between countries are 'natural' points to gather detailed travel data, as are currency exchange and foreign guest in accommodations. Furthermore, tourism statistics traditionally have a strong international economics and finances objective for which only international tourism is relevant to determine trade balances and import-export flows. Besides, countries have less of an interest in counting departures than in counting arrivals, so departures are probably underreported even if there are data available.

For most other purposes the distinction domestic versus international tourism is not very useful as both amount and character of international tourism depend to a large extent on the (coincidental) size of the country of origin (compare e.g. the United States and Luxembourg). The bias on international tourism ignores most tourists and has many caveats. It gives a distorted image of tourism. Total tourism numbers are grossly underestimated. The importance of regions for tourism is misrepresented. Europe as a region is presented as far more attractive for tourism as regions with large countries like the United States or China. However, this is definitely not the case when domestic tourism is included. The large number of international in- and outbound tourists in Europe contrasting most other areas in the world, is simply caused by the concentration of relatively small and wealthy countries in Europe. With respect to transport the bias to international tourism gives the impression that the aircraft is the main transport mode with 45%, while for all tourism air transport serves only 17% of all trips. Also the total expenditures of tourism are largely underestimated when ignoring domestic tourism. From a sociological perspective the distinction between domestic and international does not make much sense as well as the whole travel pattern becomes distorted both in number of trips, time spent away from home, spending and travel motives and attitudes. Social and political borders do not always coincide geographically. Finally, the neglect of domestic tourists makes it difficult to make consistent policies for sustainable development (e.g. poverty alleviation, climate change).

This paper presents data on the development of domestic compared to international tourism numbers and transport volumes, and their respective impacts on the economy and the environment.

Domestic tourism numbers

Total domestic tourism in 2005 has been estimated to be in the order of 4.0 billion arrivals (UNWTO Department of Statistics and Economic Measurement). In the following we provide an estimate of the share of these trips made by citizens in developed and in developing countries, respectively.

For **developed countries** the following figures have been found:

- Domestic trips in the EU have been estimated at 510 million per year (Peeters *et al.* 2007).
- The US domestic market is much larger at 1.2 billion domestic trips (WTO 2005). Another report using a broader definition even shows a stable figure of around 2 (!) billion person-trips per year for the years 2006 -2012 of which around 25 % for business and 75 % for leisure purposes (Shifflet *et al* 2008).
- Other developed regions add rather small domestic tourist trip numbers, for instance 72 million overnight tourists in Australia in 2005. But if the same-day visitors are included it results in a total of 200 million visitor numbers (Australian Bureau of Statistics 2007).
- The assumption is thus that the remaining developed world (excluding the EU and USA) may account for 250 million domestic tourist trips.

As far as the **former Soviet bloc countries** are concerned:

- For Russia very little reliable data is available on domestic travel. But trip volume is variously estimated at between 75 - 100 million trips a year. Of these, less than 20 per cent involve air transport. However, domestic trip volume is still well down on the numbers achieved during the Soviet era. In those days, social tourism was widespread. The government had a whole raft of economic measures designed to stimulate holiday taking and trade unions provided subsidies for employees who could not afford to go on holiday. Today, that kind of support is almost non-existent (WTTC 2006b). There has also been a huge increase in the cost of domestic travel over the past few years – airline ticket prices increased by almost 20 per cent in 2004, according to the Russian Union of Travel Industry (RUTI) for the second or third consecutive year. And the cost of rail travel rose by over 30 percent. As a result, more and more Russians who want to go on holiday are considering trips abroad.
- Polish domestic tourism based on 1995 data (Bigano *et al.* 2004) is estimated at an impressive 86.7 million trips ranking 8 on the global domestic tourism top 10 notwithstanding substantially lower per capita income than the rest of the top 10 countries. However, this may be because (illegal) seasonal labor migration is registered as domestic tourism. See also table 2.

For developing countries, the following references were identified:

- China counted some 1.21 billion domestic tourists in 2005 (National Bureau of Statistics of China 2007). In 1990 this figure was only 280 million (WTTC 2006a) See also table 5.
- India saw 309 million domestic tourist arrivals in 2003 (Ministry of Tourism 2004). Growth in domestic tourism in India is rapid, and was estimated to be 14.3% in 2004, with an estimated 404 million trips in 2005 (Federation of Hotel & Restaurant Association 2006). 80 % of the tourists visiting the popular tourism spot of Goa are domestic tourists strictly separated from and with totally different needs as the 20 % international tourists (Sawkar *et. al* 1998).
- Indonesia was reported to account for 108 million domestic tourist trips in 2004, i.e. at least 110 million by 2005 (Ministry of Culture and Tourism 2005).
- Thailand saw 80 million domestic tourist trips in 2005 (Tourism Authority 2006).
- Other countries in Asia are assumed to account for another 100 million trips.
- In Latin American countries like Peru, the number of domestic tourists exceeds that of international arrivals by an order of magnitude, comprising 10 million domestic trips (Prom Perú 2004a, Prom Perú 2004b). If this is similar in other Latin American countries, the total number of domestic tourist trips in Latin America would be ten times the number of international arrivals (24.7 million in 2005; UNWTO 2007), i.e. about 250 million.
- In Africa domestic travel will be more restricted due to low income levels, with the exception of a few countries like South Africa. It is here estimated that the continent accounts for some 50 million domestic trips in 2005.

The total for developed countries would then be 1,960 million trips, as opposed to 2,100 million trips in developing countries. Regarding the relatively large uncertainties in these assumptions due to varying definitions and quality of sources, it is estimated that the number of domestic trips in developed countries is about equal to those in developing countries, i.e. totaling about 2 billion domestic trips, respectively.

In general, the number of domestic tourists is less than the regional population. However, according to a comparative study in 22 countries, people take domestic holidays more than once per year. These are generally rich countries, endowed with plenty of opportunities for domestic tourism and large (or at least medium-sized). This definition fits in particular Scandinavian countries (e.g., 4.8 domestic tourists per resident in Sweden) but also Canada, Australia, and the USA. In the USA, the combination of a large national area, a large number of tourist sites, high income per capita and a willingness to travel long distances contribute to explain why, on average, an average American took a domestic holiday 3.7 times in 1997. Distance from the rest of the world is also important (Bigano *et al.* 2004).

Domestic versus international tourism numbers

The well-known top-10 UNWTO rankings of most popular (international) tourism origin and destination countries undergo a profound change after including the respective countries' domestic tourist numbers.

Table 1. Top 10 tourist origins for domestic holidays, international holidays, and all holidays, by tourist numbers (millions in 1995).

Domestic		International		Total	
United States	999.0	Germany	87.4	United States	1058.5
China	644.0	United States	59.5	China	649.3
India	320.0	United Kingdom	49.1	India	323.6
Brazil	176.2	Russian Federation	25.0	United Kingdom	182.7
United Kingdom	133.6	Malaysia	24.2	Brazil	179.2
Indonesia	107.0	France	21.9	Germany	169.6
Poland	86.7	Canada	21.3	Indonesia	109.1
Germany	82.2	Italy	18.7	Canada	102.3
Canada	80.9	Japan	17.9	France	96.4
Japan	77.8	Hungary	15.3	Japan	95.7

Source: Bigano *et al.* (2004)

Table 2. Top 10 tourist destinations, per country, for domestic holidays, international holidays, and all holidays, by tourist numbers (millions in 1995).

Domestic		International		Total	
United States	999.0	France	60.0	United States	1042.4
China	644.0	United States	43.4	China	664.0
India	320.0	Spain	39.3	India	322.1
Brazil	176.2	Italy	31.1	Brazil	178.2
United Kingdom	133.6	United Kingdom	23.5	United Kingdom	157.1
Indonesia	107.0	Hungary	20.7	France	134.5
Poland	86.7	Mexico	20.2	Indonesia	111.3
Germany	82.2	China	20.0	Poland	105.9
Canada	80.9	Poland	19.2	Canada	97.9
Japan	77.8	Austria	17.2	Germany	97.0

Source: Bigano *et al.* (2004)

Table 1 and 2 show once again that domestic tourism is far more important than is international tourism. Both definitions include at least one overnight stay. If taking into account this domestic tourism component China, India, Brazil and Indonesia are important tourism markets, surpassing Germany, France and Japan in either supply or demand or both.

Surprising in table 1 are the ranks 4 (Russian Federation), 5 (Malaysia) and 10 (Hungary). Probably temporary labor migration is misclassified as tourism.

Polish domestic tourism in table 1 and 2 ranking 8 on the global domestic tourism top 10 notwithstanding substantially lower per capita income than the rest of the top 10 countries may be because (illegal) seasonal labor migration is registered as domestic tourism.

This study was based on 1995 data. More recent data for the Numbers 1 and 2 seated reveal the following:

USA:

Table 3 shows the partly actual, partly forecasted total of **domestic and international inbound** USA travel in millions of domestic trips or international arrivals). Both include same-day arrivals, i.e. visits of less than 24 hours. It shows among others that the international arrivals in 2006 only made up for only 2.5 % (51 million / 2,052 million) of total US travel. As always by far the most international arrivals (around 55%) are from the neighboring countries Canada and Mexico. The report further shows that “the combination of rising inflation, increasing unemployment, tightening credit conditions, high levels of consumer debt, declining housing wealth, and stagnant wages are finally taking a toll on domestic USA travel” from the 3rd quarter of 2008. Around 25 % of the domestic trips are for business and 75 % for leisure purposes. Another remarkable fact: leisure travel remained resilient while business travel has already been declining in 2008 in the wake of shrinking corporate profits, particularly in travel-prone industries, leisure travel remained resilient. Only in 2009, leisure travel will finally capitulate to souring economic conditions. Furthermore, the weaker dollar and relative, albeit softening, strength in the economies of key origin markets continues to drive international arrivals. (Shifflet *et al* 2008).

Table 3: Total US Travel 2006 -2012 (in millions of domestic trips and international arrivals)

	2006	2007	2008	2009	2010	2011	2012
Total US Travel (mn)	2,052	2,056	2,048	2,038	2,050	2,077	2,109
%chya	0.5%	0.2%	-0.4%	-0.5%	0.5%	1.3%	1.6%
Domestic Person-Trips (mn)	2,001	1,999	1,987	1,975	1,982	2,006	2,035
%chya	0.4%	-0.1%	-0.6%	-0.6%	0.4%	1.2%	1.5%
International Arrivals (mn)	51.0	56.7	60.8	63.8	67.0	70.4	73.5
%chya	3.6%	11.3%	7.2%	4.9%	5.1%	5.0%	4.5%
Canada	16.0	17.7	19.6	20.5	21.5	22.5	23.5
%chya	7.6%	11.0%	10.3%	4.7%	4.9%	4.8%	4.3%
Mexico	13.3	14.3	14.9	15.5	16.2	16.9	17.5
%chya	5.1%	7.6%	3.8%	4.2%	4.5%	4.3%	3.8%
United Kingdom	4.2	4.5	4.8	5.0	5.2	5.5	5.8
%chya	-3.9%	7.7%	5.7%	4.9%	5.2%	5.0%	4.5%
Japan	3.7	3.5	3.5	3.7	4.0	4.2	4.5
%chya	-5.4%	-3.8%	-0.5%	6.2%	6.4%	6.2%	5.6%
Germany	1.4	1.5	1.7	1.8	1.9	2.0	2.1
%chya	-2.1%	10.0%	11.1%	5.1%	5.3%	5.1%	4.6%

Source: Shifflet et al 2008.

Outbound tourism:

Table 4: Outbound tourism numbers USA 1998 – 2007 in millions:

Year:	Total	By air in millions	By air in % of total
1998	55.7	31.1	56%
1999	57.2	33.2	58%
2000	61.3	35.7	58%
2001	59.4	33.6	57%
2002	58.1	31.4	54%
2003	56.3	32.5	56%
2004	61.8	36.5	59%
2005	63.5	38.4	60%
2006	63.7	39.8	62%
2007	64.1	40.8	64%

Sources: U.S. Department of Commerce 2008a and 2008b

China:

China **domestic tourists**, in correlation with both increased disposable income and leisure time, took 1.1 billion domestic trips in 2004. With the Travel & Tourism industry in its relative infancy, the vast majority of Chinese tourists are visiting destinations which are closer to home. In this respect the domestic market can be seen as the feeder market for future outbound travel, whetting the appetite for more adventurous and exotic destinations. This is particularly well illustrated by CNTA's statistics on domestic and international travel as shown below. The domestic : **international inbound** travel ratio has been remarkably stable throughout the years while the domestic : international outbound travel ratio has been going down steeply. Between 2004 and 2013 the number of urban households earning between US\$4,800 and US\$9,600 per year is forecast to grow by 10.2 per cent per annum and those earning in excess of US\$9,600 will increase by 16.1 per cent. It is the residents of China's cities who are most likely to travel and most noteworthy are the residents of Beijing, Shanghai and the cities of Guangdong province, such as Shenzhen and Guangzhou. Inbound tourism has become a valuable contributor to China's national economy. Inbound international arrivals in 2004 totaled almost 42 million, a 26.7 per cent increase on 2003's arrivals, and, if more fairly compared, given the negative impact of SARS in 2003 in the interim, a substantial 13.5 per cent increase on 2002's figures. These statistics do not include inbound arrivals from the SARs. If both Hong Kong and Macau are included, the figure rises to 109 million arrivals, showing that China is still to a greater extent (61.5 %) dependent on expatriate ties to generate a considerable proportion of its inbound tourism. The 109 million tourists received in 2004 contrast starkly when comparing with previous decades – 10.5 million arrivals in 1990 and 31.2 million arrivals in 2000.

Table 5: China: Domestic versus international inbound travel, 1990, 2000 and 2003 - 2004

Year	Domestic (^{'000} trips)	International (^{'000} trips)	Ratio Domestic: International
1990	280,000	10,500	27:1
2000	744,000	31,200	24:1
2002	878,000	37,000	24:1
2003	870,000	33,150	26:1
2004	1,102,000	42,000	26:1
2004 (1)	1.102,000	109,000	10:1

(1) International arrivals including Hong Kong and Macau

Own table based on WTTC (2006a)

Outbound tourism growth in China has outrun that of the burgeoning domestic and inbound sectors. Between 2001 and 2004, outbound tourism from China rose by an average of 29.3 per cent per year to total some 28.8 million trips abroad in 2004. The future for outbound tourism according to the World Tourism Organization is looking bright with a prediction of 100 million outbound travelers by 2020, calculated on an assumed 12.8 per cent average annual growth and consequently cornering a 6.4 per cent global market share.

Table 6: China: Domestic versus international outbound travel, 1990, 1995 and 2000-2004

Year	Domestic (‘000 trips)	International (‘000 trips)	Ratio Domestic: International
1990	280,000	620	452:1
1995	629,000	4,521	139:1
2000	744,000	10,473	71:1
2001	784,000	12,133	65:1
2002	878,000	16,602	53:1
2003	870,000	20,222	43:1
2004	1,102,000	28,850	38:1

Source: WTTC (2006a)

Domestic versus international outbound travel: an international comparison

Table 7 and Figure 1 provide a comparison between a choice of 25 countries taking into account :

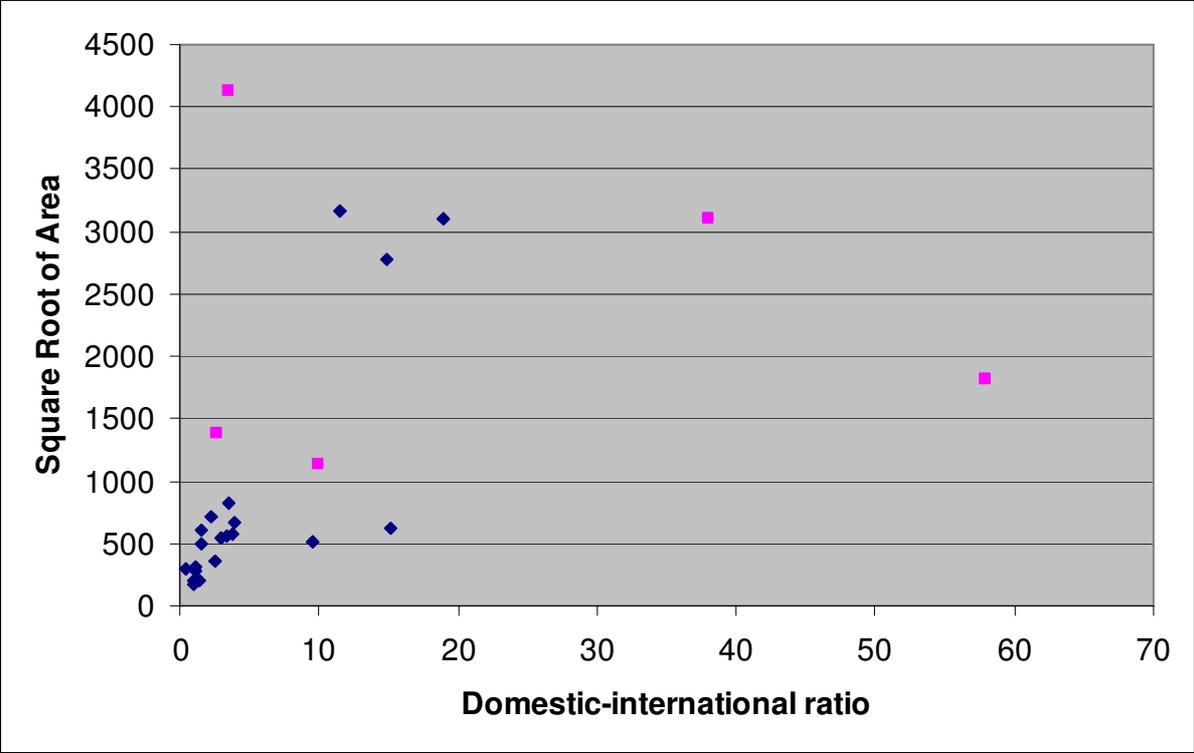
- Ratio domestic : international outbound travel.
- Level of development of the country's (tourism) economy: mature versus immature tourism market. In this respect we will consider India, China, Peru, Russian Federation and Indonesia as (still) immature markets illustrated as pink dots in Figure 1. These countries tend to have a (much) higher ratio than the mature markets. Indonesia's much lower ratio than expected is caused by huge underestimation of the amount of domestic travellers (for the year 2006 only 11.6 million) based on the very limited definition "guests in hotels and similar establishments". The lower than expected Russian ratio has already been explained earlier on.
- Distance from the border. The square root of the country's area (in square km's) is taken as its measurement method. As illustrated by Australia and Canada, the higher this value, the higher the country's expected ratio domestic: international outbound travel. Obvious things are even more complicated: the length of the country's border and the average distance and even more important average travel time of the inhabitants to that border should also be taken into account. The respective distances for USA, China and Canada are almost similar. One could therefore argue that the long term ratio domestic : international outbound travel for China could be around the USA level of 19:1 or even the Canada level of 11.5 meaning that the above mentioned relative growth of the Chinese international outbound travel compared to domestic travel could potentially more than double in the long term.

Table 7: Domestic versus international outbound travel

Country	Ratio	Area	Square root
	Domestic: International	(sq. km's)	of area (km's)
Netherlands	1.02 : 1	41,528	204
United Kingdom	1.51 : 1	242,900	493
Poland	3.39 : 1	312,685	559
Belgium	0.96 :1	30,528	174
Austria	0.42 :1	83,872	290
France	3.5 :1	674,843	821
Italy	3 : 1	301,338	549
Spain	2.18 : 1	504,030	710
Portugal	1.12 : 1	92,345	304
Greece	2.5 : 1	131,990	363
Germany	1.53 : 1	357,022	598
China	38 : 1	9,596,961	3,098
USA	19 : 1	9,629,091	3,103
Russia	3.57 : 1	17,075,000	4,132
Australia	14.9 :1	7,741,220	2,782
India	58: 1	3,287,240	1,813
Canada:	11.47 : 1	9,984,670	3,160
Japan:	15.15 : 1	377,873	615
New Zealand	9.6 : 1	268,680	518
Peru	9.9 : 1	1,285,216	1,134
Indonesia	2.7 : 1	1,912,988	1,383

Sources: EU-countries: UNWTO figures year 2000; China: Table 5 year 2004; Russia: (WTTC 2006b) year 2004; USA: (WTO 2005 and US Department of Commerce 2008a) year 2004; Australia: (Australian Bureau of Statistics 2007) year 2006; India: (Ministry of Tourism 2004) year 2003; Canada: UNWTO figures year 2006; Japan: UNWTO figures year 2004; New Zealand: UNWTO figures year 2007; Peru: UNWTO figures year 2006, and Indonesia: UNWTO figures year 2006

Figure 1: Domestic - international outbound travel / distance from the border / level of tourism development



Domestic versus international tourism: the economic impacts

Domestic tourism numbers are difficult to find. The same is true for the economic significance of domestic tourism compared to international travel. In the Tourism Satellite Accounting System (Commission of the European Communities *et al* 2001, WTTC 2006a, 2006b and 2006c) the Personal Travel and Tourism category includes all personal spending by an economy's residents on Travel & Tourism services (lodging, transportation, entertainment, meals, financial services, etc) and goods (durable and nondurable) used for Travel & Tourism activities. Spending may occur before, during or after a trip. Spending covers all Travel & Tourism, **outbound and domestic**, including both same-day visitors and overnight tourists. And the Business travel category of expenditures by government and industry includes spending on goods and services (transportation, accommodation, meals, entertainment, etc) for employee business travel purposes, **outbound and domestic**. Furthermore, the Visitor Exports category includes expenditures by **international inbound** visitors on goods and services within the resident economy.

For China for the year 2006 (WTTC 2006a) this results in the following predicted respective direct economic contribution:

Personal Travel and Tourism (outbound and domestic): 776.7 billion Rmb (US\$ 99.1 billion)

Business Travel (outbound and domestic): 274.8 billion Rmb (US\$ 35.1 billion)

Visitor Exports (inbound): 288.7 billion Rmb (US\$ 36.8 billion)

Assume a 2006 domestic : outbound ratio of around 30 :1 and the direct economic contribution of domestic tourism becomes obvious.

For the Russian Federation for the year 2006 (WTTC 2006b):

Personal Travel and Tourism (outbound and domestic): 1,076.9 billion Rb (US\$ 37.4 billion)

Business Travel (outbound and domestic): 349.8 billion Rb (US\$ 12.1 billion)

Visitor Exports (inbound): 249.9 billion Rb (US\$ 8.7 billion)

An illustration once again of the developing tourism country status of the Russian Federation.

For India for the year 2006 (WTTC 2006c):

Personal Travel and Tourism (outbound and domestic): 935.4 billion INR (US\$ 21.4 billion)

Business Travel (outbound and domestic): 260.8 billion INR (US\$ 6 billion)

Visitor Exports (inbound): 302.2 billion INR (US\$ 7 billion)

For the USA for the year 2006 the total spending of the earlier mentioned 2 billion domestic tourists was a staggering US\$ 727.5 billion of which business travel US\$ 214.3 billion and leisure travel the remaining US\$ 513.2 billion. It is expected to grow to a total of 937 billion (264.3 billion (business) and 672.7 billion (leisure) in 2012. Business trip spending is about 70 % higher per trip than leisure (Shifflet *et al* 2008).

To conclude this short overview, Australia TSA figures (Australian Bureau of Statistics 2007) show a comparison between the average tourism expenditures on domestically produced

goods and services per trip of the domestic leisure and business tourists (including expenditure by outbound Australian residents before/after international trips as well as including both same-day visitors and overnight tourists) and the international inbound tourists visiting Australia.

Table 8: Average tourism expenditures on Australian goods and services per visitor: domestic versus international inbound tourists (in Australian \$)

Year	Domestic	International Inbound	% Domestic of International
2000-01	326	3,740	8.7%
2001-02	338	3,930	8.6%
2002-03	345	3,929	8.8%
2003-04	357	3,874	9.2%
2004-05	378	3,627	10.4%
2005-06	397	3,742	10.6%

Source: Own table based on Australian Bureau of Statistics 2007

As could be expected the domestic visitor expenditures per trip are only a small part of the international inbound expenditures per visitor per trip. But the average international inbound trip is far less frequent and lasts far longer than the average domestic trip. As a result, the domestic visitors generated 75.8% of Australian tourism industry GDP while international visitors generated “only” 24.2%.

If we assume that the Australian outcome of 10.4 % over the period 2004-05 would also be a reasonable estimation for the Chinese situation in 2004 (see table 5) with 1,102,000,000 domestic visitors against 42,000,000 international inbound visitors (including Macau and Hong Kong SAR’s). This would mean that the contribution of the domestic visitors to the Chinese tourism GDP would be 2.7 times larger than the contribution of the international inbound visitors: 72 % against 28 %.

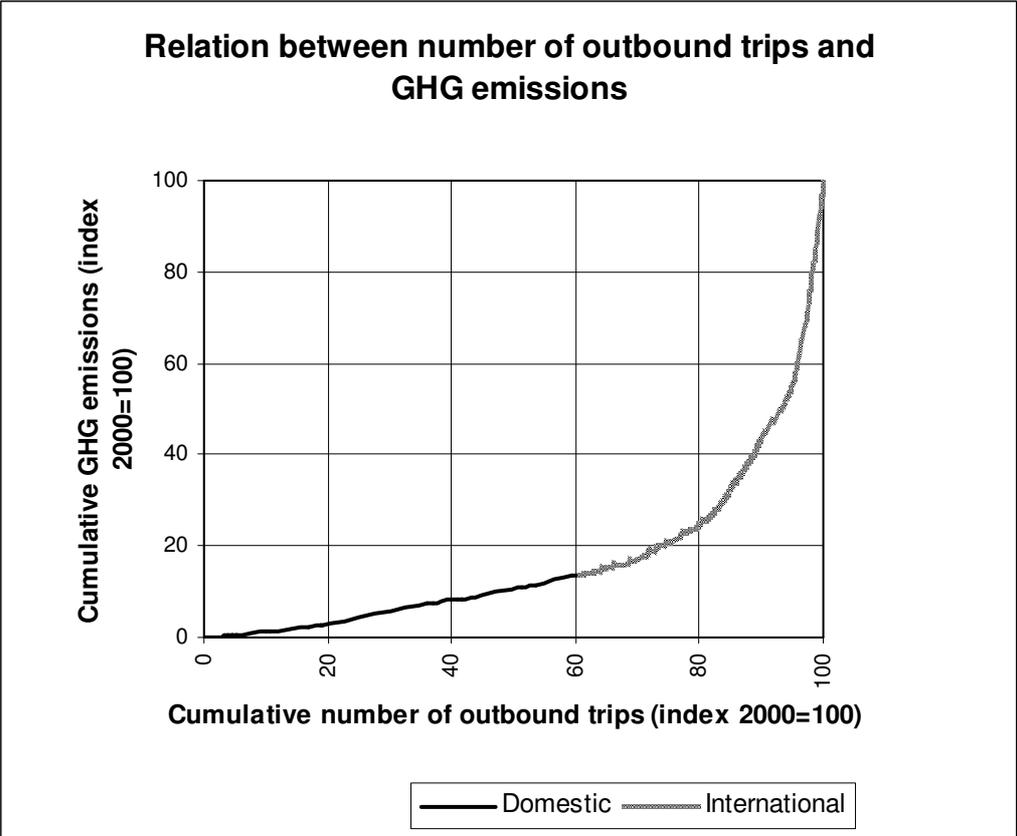
Domestic versus international tourism: the environmental impacts

This section provides an introduction to the environmental impacts from domestic and international tourism from a global perspective. It focuses on tourism impacts on climate change through energy use, which is one of the most pressing issues regarding the future sustainability of tourism (Gössling *et al.* 2008; UNWTO/UNEP/WMO 2008). Until recently, environmental impact research was conducted on a destination level (Hunter and Green 1995; Simmons and Becken 2004; Hall and Higham 2005; Peeters 2005), analysing impacts on ecosystems, flora and fauna or water quality (e.g. Mathieson and Wall 1982), describing the change and destruction of landscapes (Krippendorf 1975) and often focusing on one form of tourism (e.g. nature-based tourism: Boo 1990; Ceballos-Lascuráin 1996; Buckley 2004). Impacts from tourism energy use were hardly mentioned and those from transport were limited to local air and noise pollution or traffic congestion. Following the influential IPCC Special Report on Aviation and the Global Atmosphere ((IPCC 1999), tourism researchers started pleading for more awareness and inclusion of the impacts from tourism energy use and GHG emissions (Gössling 2000; Høyer 2000). These authors strongly linked air travel from tourism to global warming. In 2003, climate change slowly became an issue for the tourism sector when it was picked up by the World Tourism Organisation for its 1st International Conference on Climate Change and Tourism at Djerba, Tunisia (WTO 2003). It took four more years before mitigation action was urged from all tourism actors in the Davos Declaration (UNWTO/UNEP/WMO 2007). Finally, the sector has arrived at a point where the impacts from climate change on the environmental assets of tourism itself cannot be ignored. This should not only motivate actors to initiate adaptation strategies, but rather to start developing and implementing mitigation efforts.

Besides through energy use, tourism contributes to global environmental change through changes in land cover and land use, biotic exchange and extinction of wild species, exchange and dispersion of diseases, changes in the perception and understanding of the environment and water use (Gössling 2002). These are global phenomena, each covering a multitude of local tourism activities. Energy use based on fossil fuels is responsible for tourism's greenhouse gas (GHG) emissions. For analysis, energy use from tourism is broken down in four main components: origin-destination (O/D) transport, accommodation, transport at the destination and activities (Becken and Simmons 2005; Peeters and Schouten 2006), sometimes reduced to transport, accommodation and activities (e.g. by UNWTO/UNEP/WMO 2008). Initial research on tourism energy use again focused on international tourism or concentrated on one destination (Gössling 2000; Becken 2002; Gössling 2002; Schmied *et al.* 2002; Becken and Cavanagh 2003; Patterson and McDonald 2004). European tourism transport emissions, both domestic and international, were first analysed by Peeters *et al.* (2004). A very uneven distribution of emissions was found in most

of these cases, with roughly 20% of all trips being responsible for up to 80% of emissions (Peeters *et al.* 2007). This type of distribution – similar to a power law – can be seen when visualising European domestic and international trips and their cumulative GHG emissions in one graph (Figure 2): domestic tourism makes up the majority of all trips but only a small part of emissions, whereas relatively few international trips dominate in GHG emissions. Air travel, notably long-haul flights, is found largely responsible for this disparity.

Figure 2: Relation between cumulative number of domestic and international trips and GHG emissions for European tourism sorted on distance for year 2000



Source: Based on MuSTT data model output (Peeters *et al.* 2004)

A first attempt to estimate carbon dioxide (CO₂) emissions from worldwide international and domestic tourism was made for the 2008 World Tourism Organization report on climate change (UNWTO/UNEP/WMO 2008). Figures are for 2005 and based on a mix of hard data, estimations and approximations. Visitors (domestic and international) are divided in tourists (overnight visitors) and same-day visitors. Total tourism demand (overnight and same-day; international and domestic) is estimated at 9.8 billion arrivals in 2005. We focus on the main outcomes concerning impacts from domestic and international tourism.

5 billion arrivals are estimated to be from same-day visitors (4 billion domestic and 1 billion international) and 4.8 billion from arrivals of overnight visitors/tourists (4 billion domestic and 800 million international). International tourism *trips* are estimated at 750 million; domestic tourism trips outnumber these by more than a factor five. International and domestic tourism emissions from transportation, accommodation and activities – including same-day visitors – are estimated to represent between 3.9% and 6.0% of all global emissions in 2005, with a best estimate of 4.9% (ibid.).

75% (980 Mt CO₂) of all tourism emissions are transport-related. The majority of these (52% or 515 Mt CO₂) are caused by air travel, 43% (420 Mt CO₂) by car travel and only 3% by other forms of transport (train, coach, ship). Accommodation and activities are responsible for 21 (274 Mt CO₂) and 4% (48 Mt CO₂) of global tourism emissions respectively (see Figure 3). When including radiative forcing – a metric for measuring the extent to which GHG emissions raise global average temperatures – transport would make up 81% to 90% (excluding and including cirrus impacts) of tourism emissions.

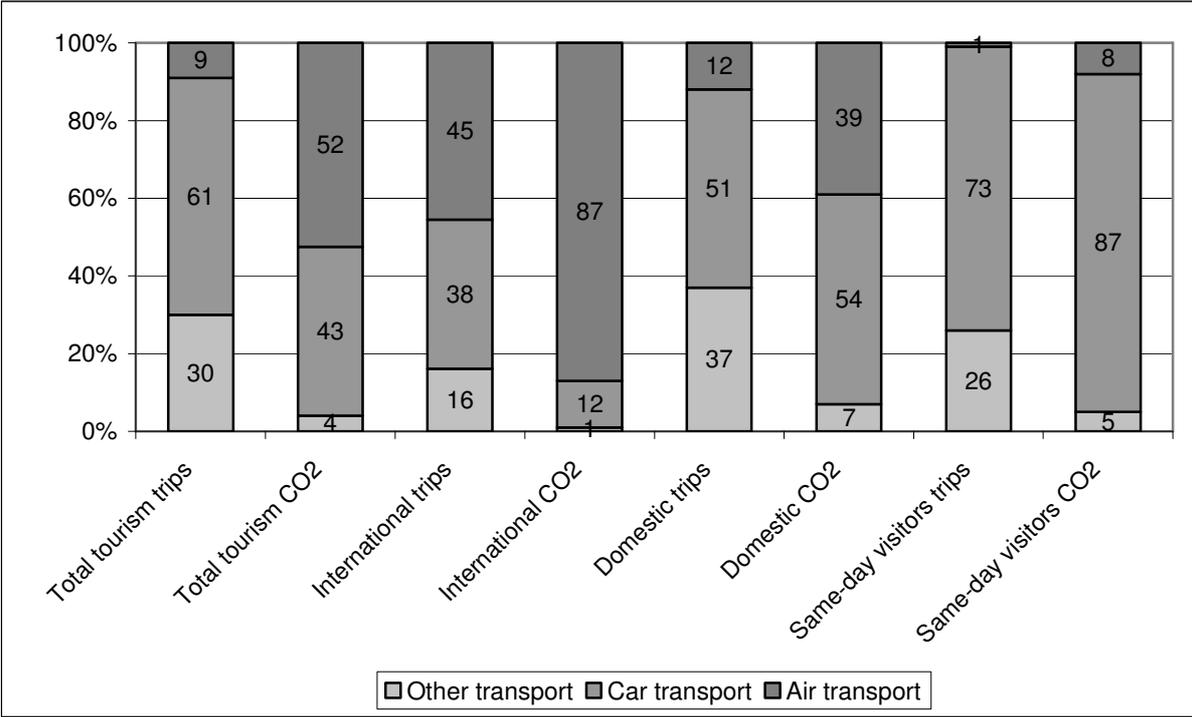
Figure 3: Tourism CO₂ emissions in 2005 (Mt)

	Total tourism	International	Domestic	Same-day visitors
Activities	48	not available	not available	not available
Accommodation	274	117	158	0
Other transport	45	4	34	7
Car transport	420	46	259	115
Air transport	515	321	185	11
Sum	1302	488	636	133

Source: UNWTO/UNEP/WMO ((2008)

Figure 4 shows how the modal split differs in terms of trip numbers and corresponding emissions for international and domestic tourism. 45% of international trips use air travel, whereas this figure is only 12% for domestic trips and 1% for all same-day visitors. Air travel is responsible for 87% of international tourist trip emissions (321 Mt CO₂). Domestic trip emissions are dominated by car transport (54%, 259 Mt CO₂). A large share of domestic trips is made by other transport modes than airplanes or cars (37%), but these only produce 7% (34 Mt CO₂) of domestic tourism transport emissions. For all tourism trips, the impact of air travel on emissions is plainly visible.

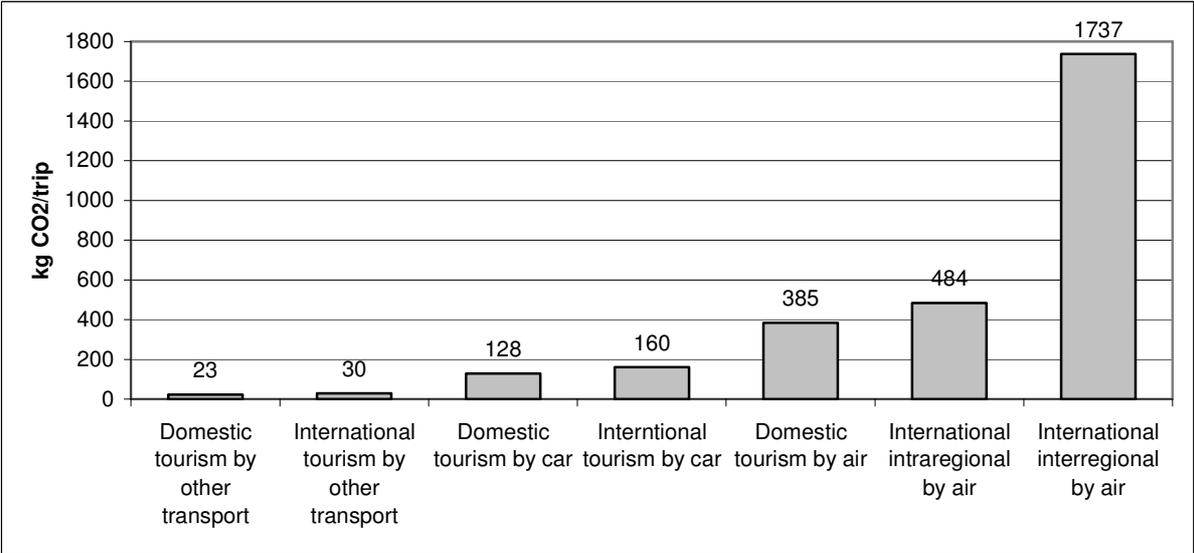
Figure 4: Modal split of trip numbers and CO₂ emissions (2005)



Source: UNWTO/UNEP/WMO (2008)

4 billion domestic tourists produce 479 Mt of transport-related CO₂ emissions, while 750 million international tourists come to a total of 371 Mt transport-related CO₂. Emissions per trip by international tourists are thus 4 times higher than by domestic tourists (494 vs. 120 kg CO₂ per trip – only transport-related emissions). More evidence of air transport’s high emissions can be seen in per trip emissions of different transport modes. Domestic trips by air produce 385 kg CO₂ per trip, international intraregional trips by air 484 kg CO₂. Interregional trips (by air) show the highest emission figures: 1737 kg CO₂ per trip. In comparison, a domestic trip by car produces 128 kg CO₂ and international trips by other transport modes average only 30 kg CO₂ (transport only) (see Figure 5).

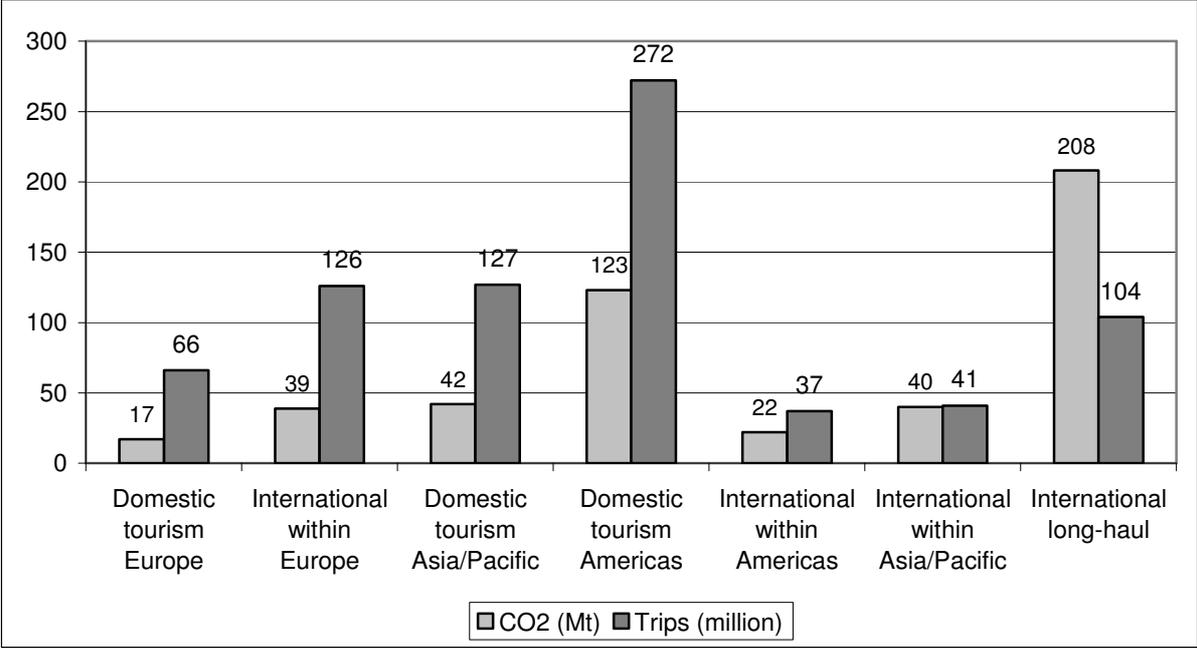
Figure 5: CO₂ emissions per trip and transport mode (2005)



Source: UNWTO/UNEP/WMO (2008)

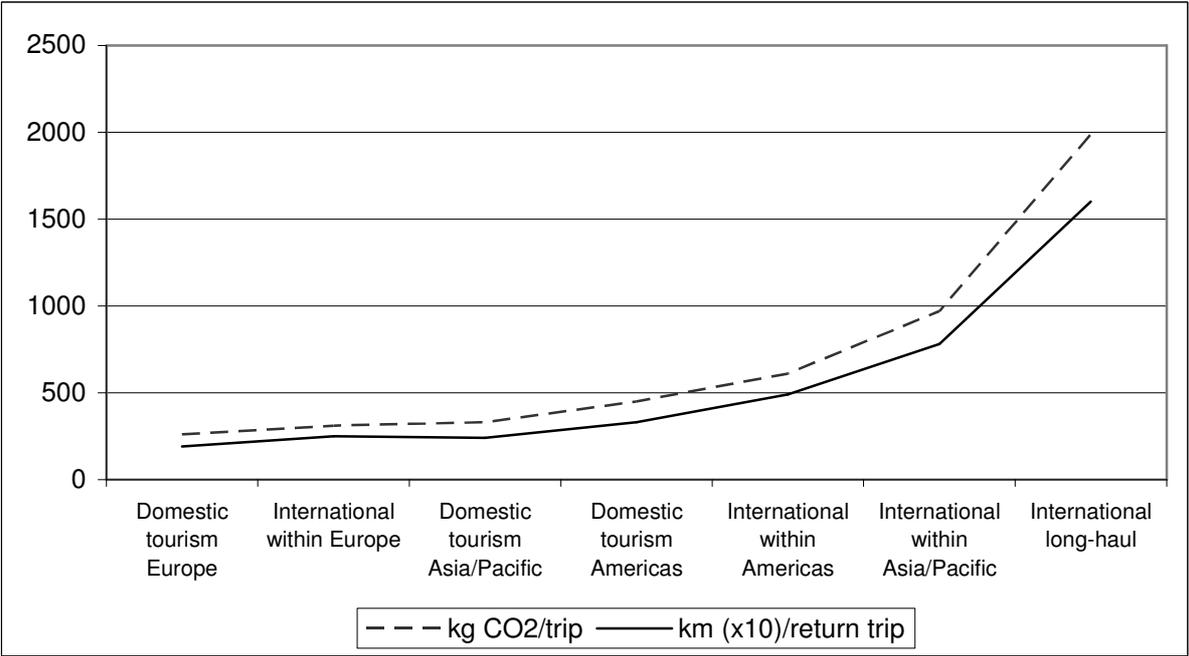
Looking at tourist air travel within regions (total 289 Mt CO₂), domestic air travel produces more emissions than international air travel in the Americas (123 vs. 22 Mt CO₂) and in Asia and the Pacific (42 vs. 40 Mt CO₂), whereas within Europe international air travel dominates air travel emissions (39 vs. 17 Mt CO₂ domestic air travel). This is mainly due to differences in country size and, consequently, high domestic trip numbers in the Americas and Asia/Pacific and high international trip numbers in Europe (see Figure 6). Due to the same reason (increasing travel distance) domestic tourism trips by Americans are much more energy intensive than those made by Europeans (450 vs. 260 kg CO₂ per trip). Of interregional tourist air travel (total 217 Mt CO₂), most emissions are produced by 104 million long-haul flights (total 208 Mt CO₂). These flights only make up 12% of all trips made by air (overnight and same-day), but are responsible for 40% of all air transport emissions. Long-haul flights are also the only form of tourism trips in Figure 6 where the ratio between trip numbers and emissions is actually negative (1:2) compared to other trip forms. The influence of travel distance on emissions is clearly seen in Figure 7: CO₂ emissions per trip increase proportionally with greater return distances (cf. Peeters et al. 2007).

Figure 6: Tourist trips by air transport and CO₂ emissions per O/D region in 2005



Source: UNWTO/UNEP/WMO ((2008))

Figure 7: Return distance and CO₂ emissions per trip and O/D region (2005)



Source: UNWTO/UNEP/WMO (2008)

For 2035 the UNWTO projects tourism CO₂ emissions to rise by 161% and aviation’s share to grow from 40% to 52% (‘business-as-usual’ scenario). Total tourism emissions would reach around 3,057 Mt CO₂, compared to 1,167 Mt CO₂ in 2005 (excluding same-day visitors) (UNWTO/UNEP/WMO 2008). Such a scenario will certainly interfere with global

emissions reduction efforts of up to 80% by 2050 (IPCC 2007). Mitigation efforts in the aviation sector are not likely to offset the industry's predicted growth (ibid.). Technical measures, favoured by the aviation industry, need to be complemented by behavioural change. The tourism sector is required to enable such change by using different marketing techniques and decarbonising their products (Peeters *et al.* 2008).

From a global environmental point-of-view, domestic tourism is generally more sustainable than international tourism, although such a statement neglects differences caused by country size. Within both forms, surface-based tourism is to be preferred above air travel, which is particularly detrimental when used for long-haul flights. Again, distance is the most important factor for high emission figures; per km emissions for example are actually a little lower for interregional air travel than for domestic air travel. Therefore, one conclusion is to start using distance classes instead of national border crossings in tourism statistics. These would cover the environmental impacts of tourism (trip sustainability) far more accurately, as they ignore differences in country size and include large domestic tourism volumes (Peeters *et al.* 2007). The UNWTO is aiming to alleviate poverty in developing countries through sustainable tourism development through its ST-EP programme. At the same time, it wants tourism to become environmentally sustainable on a global scale, i.e. regarding the sector's GHG emissions. International (West-South) tourism to developing countries depends on high-emission long-haul flights, i.e. those trips causing a large part of tourism emissions. Thus, a reduction in demand for these trips will significantly reduce overall tourism emissions (cf. Peeters *et al.* 2008). Environmentally sustainable tourism to developing countries should rather be domestic or intraregional (South-South). The domestic and regional arrival and expenditure figures shown above support this theory, which also applies to several West-West tourism flows (e.g. North America – Europe) (cf. Nawijn *et al.* 2008).

Conclusions

The tourism sector and tourism research community focus mainly on international in- and outbound tourism volumes and expenditures. Statistics on international tourism as reported by among others the UNWTO are more or less consistent, comprehensive and up-to-date. But international tourism is only one part and certainly in number of arrivals, domestic tourism is several times larger than international. However, consistent data on world-wide domestic tourism are not so readily available. Whereas international tourism movements are hard to measure, domestic tourist movements are even harder to track. Estimations for 2005 arrive at 4,000 million domestic trips against “only” 750 million international trips although these estimations differ hugely dependent on the definition used with regard to domestic trips. The bias on international tourism ignores most tourists and has many caveats. It gives a distorted image of tourism. Total tourism numbers are grossly underestimated. Top 10 rankings of most popular countries of origin and destination change profoundly if domestic tourism numbers are taken into account. The two major generators of domestic tourism, USA and China, dominate these new rankings. Furthermore, a high percentage of both inbound and outbound international trips take place between neighbouring or nearby countries emphasizing the importance of intraregional as opposed to interregional international trips.

As an additional consequence the economic importance of domestic tourism has been grossly underestimated as well. Domestic visitors generated 75.8% of Australian tourism industry GDP in the year 2004-2005 while international visitors generated “only” 24.2%.

The enormous differences in environmental impacts, with a specific focus on GHG emissions, of domestic versus international, particularly long-haul tourism are taken into account as well. International interregional tourism flows, be it West-South or West-West tourism flows (e.g. North America – Europe) highly depends on high-emission long-haul flights, i.e. those trips causing a large part of tourism emissions. Thus, a reduction in demand for these trips will significantly reduce overall tourism emissions. Environmentally sustainable tourism should therefore rather be domestic or intraregional (South-South, intra-Europe, intra – North America).

To conclude, distance is the most important factor for high emission figures; per km emissions for example are actually a little lower for interregional air travel than for domestic air travel. Therefore, one conclusion is to start using distance classes instead of national border crossings in tourism statistics. These would cover the environmental impacts of tourism (trip sustainability) far more accurately, as they ignore differences in country size and include large domestic tourism volume

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