Chapter 2

Mapping Tourism's Global Footprint: Impacts on Biodiversity and Local Livelihoods

2.1 The Maps

Chapter 1 has highlighted the broad relationships between tourism development, biodiversity, and local livelihoods. This chapter reviews this relationship in more depth, focusing on the impact of tourism in the biodiversity hotspot countries.

The maps presented serve to illustrate the following key issues:

- Although most biodiversity is concentrated in the South, many major tourism destinations in the North (e.g., the Mediterranean, the California Coast, Florida Keys) also coincide with biodiversity hotspots.
- Although they receive fewer tourists overall than the North, many economically poor, but biodiversity-rich, countries in the South receive large numbers of tourists.
- Many hotspot countries in the South are experiencing very rapid tourism growth.
- Over one-half of the poorest 15 countries fall within the biodiversity hotspots, and in all of these, tourism is already significant or is forecast to increase.
- In many destinations within hotspot developing countries, biodiversity is the major tourism attraction.
- Forecasts suggest that tourism will become increasingly important in hotspot countries—particularly in Southeast Asia—and this will require careful planning to avoid negative impacts on biodiversity.

The maps can also be used to illustrate the potential impacts of tourism in different countries or regions—for example, plotting the number of tourism arrivals against the population of each country allows us to predict where tourism pressure is likely to be high and environmental and social impacts more severe.

2.2 Is Tourism Significant in Biodiversity Hotspot Countries?

The hotspots map in Chapter 1 shows that, on a global level, the majority of hotspots are concentrated in the South. A map of international tourist arrivals by country for 2000 shows, however, that the majority of tourist arrivals are in the North: North America, Western Europe, and Russia stand out as significant areas for tourist visitation (Map 2). This finding is borne out by a map of arrivals by region (1995), which also shows that Southeast Asia and South America receive medium levels of arrivals. Africa, South Asia, Oceania, and Central America experience lower levels of arrivals at the regional level (Map 3).

An analysis based solely on total

Above: Togian woman preparing coconuts, Malenge Island, Indonesia.

Left: Tourists explore Africa's first canopy walkway in Kakum National Park, Ghana.

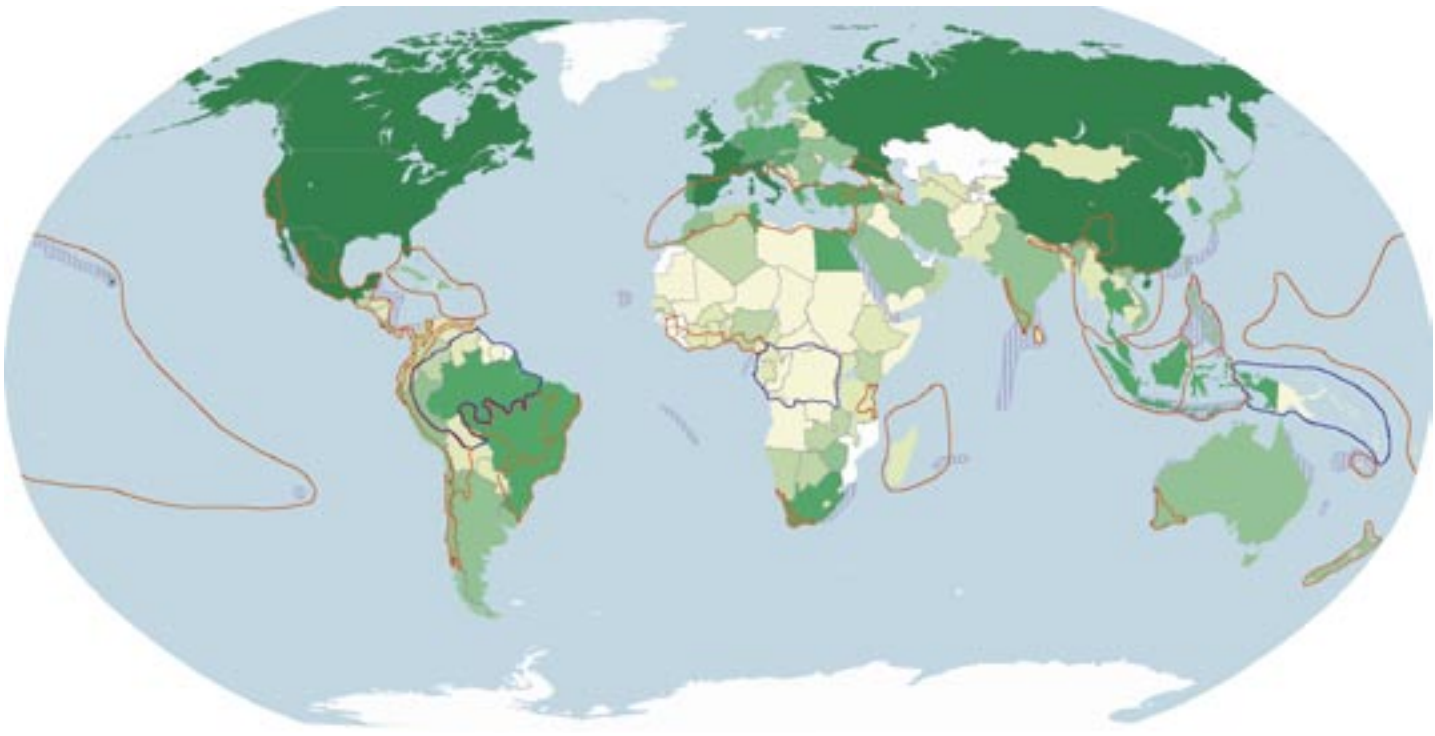
arrivals figures can obscure the pressure of tourism in some cases, as it does not take into account the size of the country to which the tourists are arriving and the amount of tourism infrastructure and planning in place. Map 2 shows fewer tourists arriving in the Caribbean than in the United States, for example, but when the relative sizes of these regions are taken into account, the implications of even this lower number of arrivals becomes clear. Although the Caribbean region, a major biodiversity hotspot, accounts for only 4 percent of international tourist arrivals, tourism plays a major role in many Caribbean economies, accounting for 15.5 percent of total employment, or one in 6.4 jobs (Hawkins et al. 2002). The biodiversity impacts of tourism development in the Caribbean may be much more significant than the statistics initially convey.

In addition, data on the volume of tourism provide no indications as to how tourists are distributed within a particular country—they may be extremely concentrated in some areas and virtually nonexistent in others. The Caribbean is again a good example, where the vast majority of tourism impacts happen at the coast, the site of often critically endangered coral reefs. Obviously, the distribution of tourists in relation to sensitive areas will affect the impact of tourism both on local livelihoods and on biodiversity.

2.2.1 Tourism is significant and growing in poor, biodiversity-rich countries

Although they receive fewer tourists overall than the North, parts of the South receive large numbers of international arrivals, and many of these coincide with

Map 2: International Arrivals Circa 2000



TOTAL ARRIVALS (IN THOUSANDS)

- Fewer than 100
- 100–500
- 500–1,000
- 1,000–5,000
- 5,000–20,000
- 20,000–70,000
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001* (Tourism Market Trends)
Conservation International 2002
Cartography: M. Denil

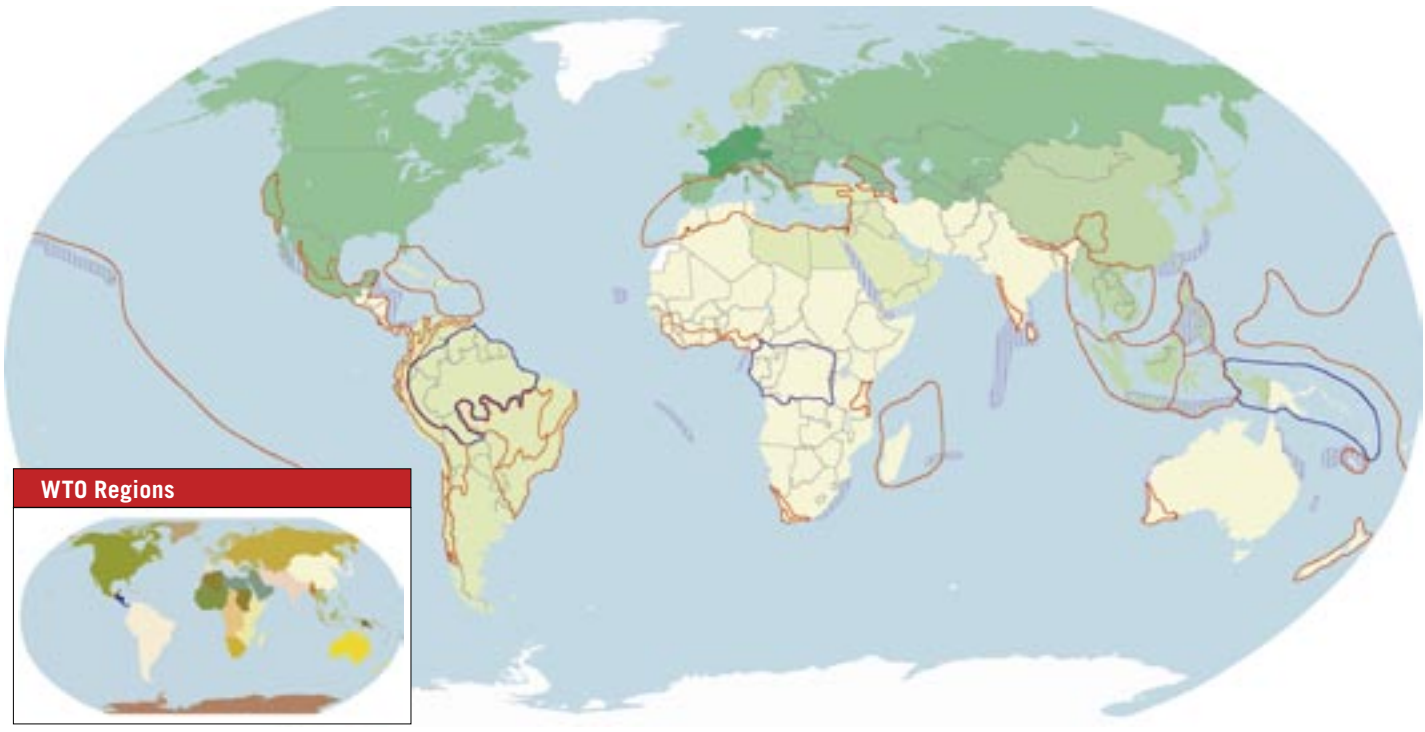
*Data for each country may be for activity from the years 1998 through 2000. Data for the latest date available in this range was selected for display here.

hotspots: Mexico (Mesoamerica hotspot), Brazil (Atlantic Forest and Cerrado), South Africa (Cape Floristic Region), Thailand (Indo-Burma), Malaysia, and Indonesia (Sundaland and Wallacea) stand out as countries with high levels of international tourism arrivals, particularly during the past decade (Map 2). At a subnational level, the Cape Floristic Region of South Africa is an important tourism destination, and the resort island of Bali falls squarely within the Sundaland hotspot.

It is also important to note that Map 2 shows only the numbers of international arrivals, yet *domestic tourism* is also highly significant in Mexico, China, South Africa, and Thailand. In Brazil, domestic tourists provided six times more room nights in classified hotels in 2001 than the 5.5 million foreign tourists (FIPE/EMBRATUR 2002). Ghimire (1997) notes that in Mexico, it was estimated that as much as 40 percent of the country's population participated in domestic tourism activities in 1994. In Thailand, domestic tourists outnumber international tourists at all major attractions. On the Philippine island of Palawan, listed by CI as one of the world's most threatened biodiversity hotspots, domestic tourism accounts for more than 50 percent of arrivals in 2003 (Christ 2003). Although the international arrivals represented in Map 2 figures are not exclusively vacation tourists, tourists can be considered a large, if not the largest, segment of those arrivals; the statistics therefore do represent significant increasing tourism travel to each biodiversity hotspot country.

Furthermore, although North America may receive many arrivals, Map 4 shows that the average annual growth rate over the last

Map 3: Regional Tourist Arrivals 1995

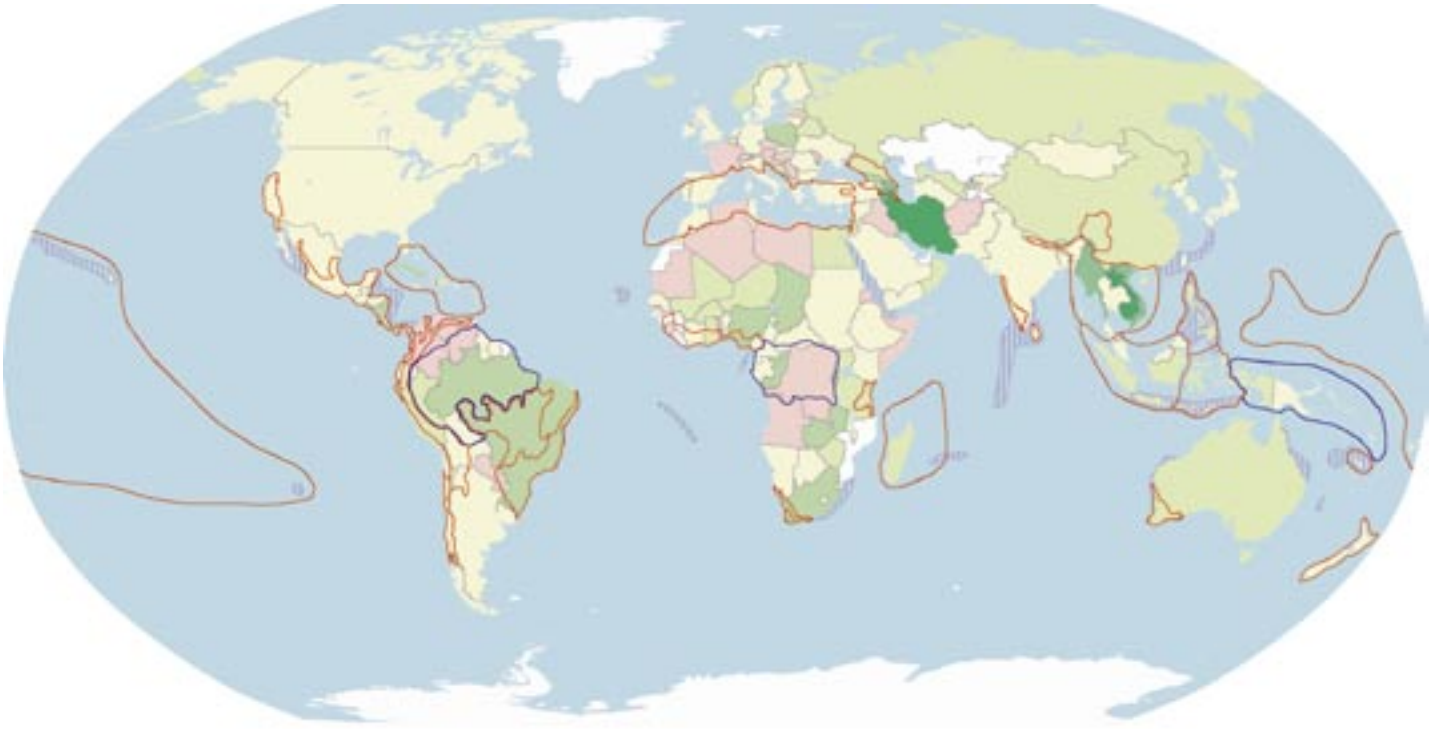


INTERNATIONAL TOURISTS ARRIVALS 1995 BY WTO REGIONS IN MILLIONS OF PEOPLE

- Up to 10
- 10–20
- 20–50
- 50–100
- 100–150
- 150–250
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001 (Tourism Market Trends)
Conservation International 2002
Cartography: M. Denil

Map 4: Average Annual Growth 1990–2000



AVERAGE ANNUAL GROWTH IN TOURISM THROUGH THE 1990s

- No growth or negative growth
- Less than 100%
- 100%–250%
- 250%–500%
- 500%–1000%
- Over 1000%
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001*
(Tourism Market Trends)
Conservation International 2002
Cartography: M. Denil

*Data for each country may be for activity from the years 1990 through 1995 and for 1998 through 2000. Data for the latest date available in this range was selected for comparison here.

10 years has been slower in North America than in other biodiversity hotspot countries such as Brazil. South Africa is among several hotspot countries where the number of international arrivals is not only large but also rapidly growing. Tourism in Laos and Cambodia (Indo-Burma) has also grown dramatically, as it has in Vietnam and Burma.[5]

Of particular importance, Table 1 identifies 22 hotspot countries where visitor arrivals have increased by more than 100 percent between 1990 and 2000. At the top of the list, Laos shows a staggering tourism increase of over 2,000 percent. Although starting from a small base (14,000 international arrivals in 1990), if Laos follows the pattern of its neighbor Vietnam, which has increased from 250,000 to 1,890,000 tourist arrivals in the last decade, the implications could be very significant in terms of negative impacts on biodiversity. Not only did the number of international arrivals in China top 10,000,000 in 1990, but it nearly tripled to 31,000,000 in 2000. By contrast, the United States, while capturing a larger number of international arrivals (51,000,000), has experienced only a comparatively modest growth rate of 29 percent in the last decade.

These patterns of growth are particularly important, since it is reasonable to assume that a significant percentage of new tourism facilities in developing countries high in biodiversity will be built on coastal and natural destinations harboring threatened ecosystems.

Further prioritizing exercises may be proposed: for example, focusing on countries with high

Table 1: Examples of Hotspot Countries Exhibiting Tourism Growth of More Than 100 Percent

Hotspot/Country	International Arrivals (in thousands)			Growth 1990–2000 (in thousands)	Percentage Growth 1990–2000
	1990	*1995*	*2000*		
Indo-Burma					
Laos	14	60	300	286	2043
Myanmar	21	117	208	187	890
Vietnam	250	1351	2140	1890	756
Macao	2,513	4,202	6,682	4,169	166
Succulent Karoo/Cape Floristic Region					
South Africa	1,029	4,684	6,001	4,972	483
Caribbean					
Cuba	327	742	1,700	1,373	420
Turks and Caicos Islands	49	79	156	107	218
Dominican Republic	1,305	1,776	2,977	1,672	128
Brazilian Cerrado/Atlantic Forest					
Brazil	1,091	1,991	5,313	4,222	387
Mesoamerica					
Nicaragua	106	281	486	380	358
El Salvador	194	235	795	601	310
Costa Rica	435	785	1,106	671	154
Panama	214	345	479	265	124
Guinean Forests					
Nigeria	190	656	813	623	328
Tropical Andes					
Peru	317	541	1,027	710	224
Madagascar and Indian Ocean Islands					
Madagascar	53	75	160	107	202
Eastern Arc Mountains and Coastal Forests					
Tanzania, United Republic of	153	285	459	306	200
Mountains of Southwest China					
China	10,484	20,034	31,229	20,745	198
Sundaland/Wallacea					
Indonesia	2,178	4,324	5,064	2,886	133
Mediterranean Basin					
Israel	1,063	2,215	2,400	1,337	126
Southwest Australia					
Australia	2,215	3,726	4,946	2,731	123
Micronesia/Polynesia					
Cook Islands	34	48	73	39	115

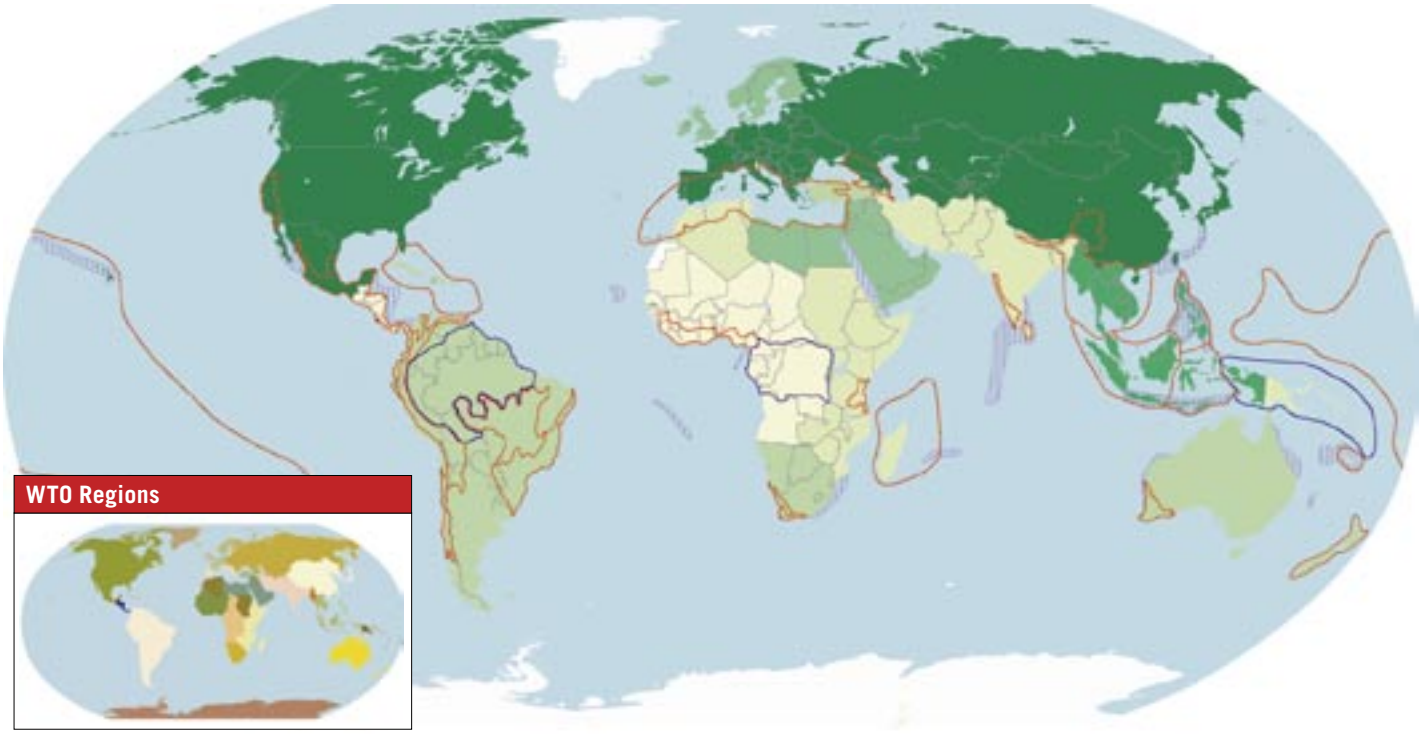
volumes of international arrivals (38 hotspot countries show over 1 million international arrivals per year, and 16 of them show over 5 million arrivals per year); or combining arrival numbers with growth rates—12 of the 22 hotspots countries with over 100 percent growth rates had over 1 million international tourists in 2000 (Australia, Brazil, China, Costa Rica, Cuba, the Dominican Republic, Indonesia, Israel, Macao, Peru, South Africa, and Vietnam). These countries clearly need to ensure that biodiversity considerations are incorporated into tourism development strategies and policies and that tourism is considered in strategic biodiversity action plans. (The Data Sets, located in the back of this book, provide a full listing of the international arrivals data for all hotspot countries.)

Looking forward to 2020, regional forecasts prepared by the World Tourism Organization (Map 5) suggest that tourism will become increasingly important in hotspot countries. South America, southern Africa, and Oceania are all expected to experience significant growth in numbers of tourists, but the Southeast Asia region stands out as one where the increase is likely to be particularly dramatic. This projection implies that, as the home to four biodiversity hotspots and one major tropical wilderness area, this region will require very careful tourism planning if it is not to suffer a serious negative impact on biodiversity.[6]

2.2.2 Prime tourism destinations in the North are located in biodiversity hotspots

Tourism in the North also has significant implications for biodiversity conservation, because biodiversity hotspots also occur in these northern destinations: the

Map 5: Regional Tourist Arrivals—Projections for 2020



INTERNATIONAL TOURIST ARRIVAL PROJECTIONS FOR 2020 BY WTO REGIONS IN MILLIONS OF PEOPLE

- Up to 10
- 10–20
- 20–50
- 50–100
- 100–150
- 150–250
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001 (Tourism Market Trends)
Conservation International 2002
Cartography: M. Denil

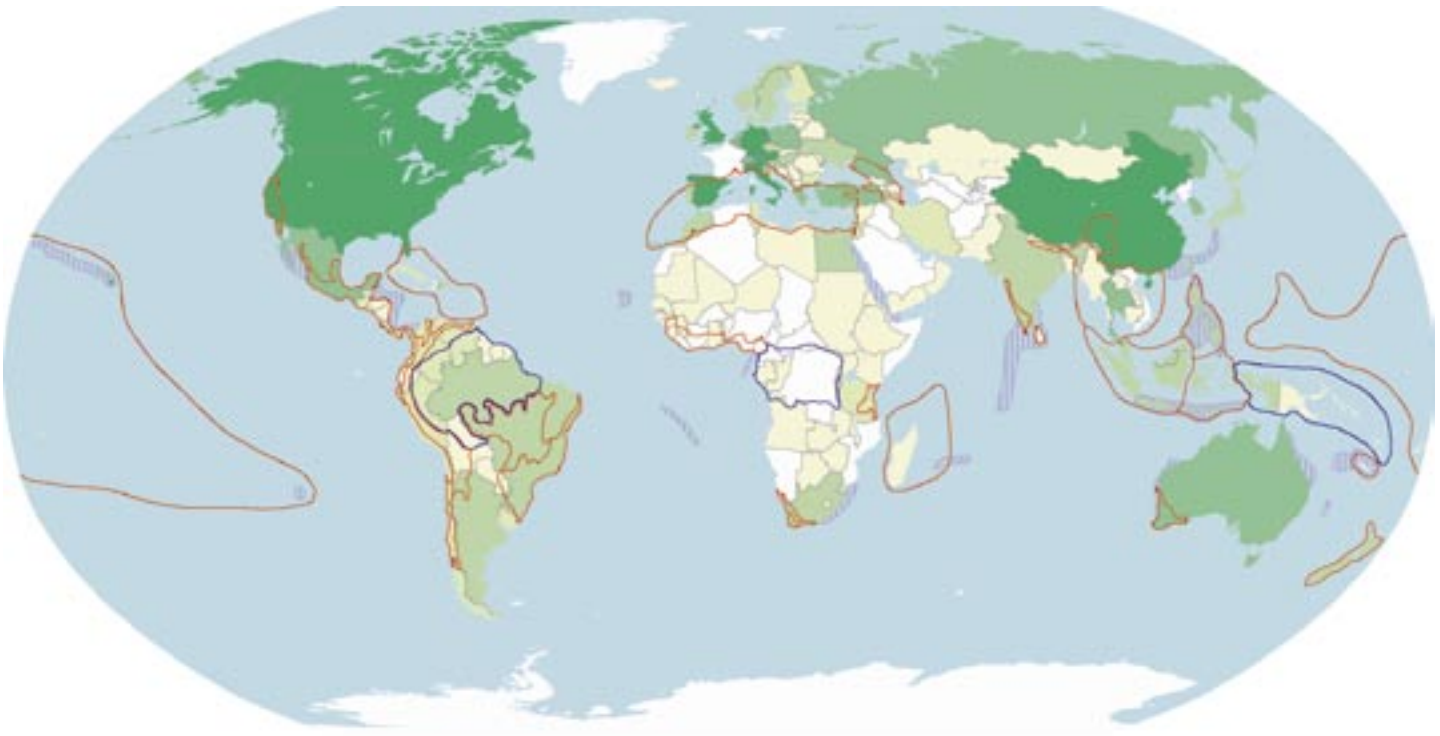
California Floristic Province, the northern part of Mesoamerica, the Mediterranean Basin, the Caucasus, and the mountains of south-central China, for example.

From the level of analysis of the global mapping exercise, it is not possible to examine the distribution of visitor arrivals across these regions—it is theoretically possible that none of China's tourists visit the south-central mountains, for example. But in actuality, tourism pressure is well documented in this area of China, and significant growth in China's domestic tourism is anticipated, with some major tourism development projects already under way. The Mediterranean is the most visited tourism region in the world, accounting for 30 percent of international arrivals and 25 percent of receipts from international tourism. The number of tourists in the Mediterranean countries is expected to increase from 260 million in 1990 (with 135 million to the coastal region) to 440–655 million in 2025 (with 235–355 million to the coastal region) (EEA 2001). It can also be noted that "the construction of infrastructure and the direct impacts of people using and trampling ecosystems remains a key threat to coastal areas in Turkey, Cyprus, Tunisia, Morocco, and Greece." (CI 2003).

2.3: Tourism, Biodiversity, and Poverty Reduction

We have already noted above that the majority of biodiversity hotspots are located in the developing countries of the South. In light of the linkages between biodiversity and tourism, and between biodiversity and sustainable livelihoods, it is clear that no biodiversity conservation strategy based on tourism alone is likely to succeed unless it

Map 6: International Tourism Receipts Circa 2000



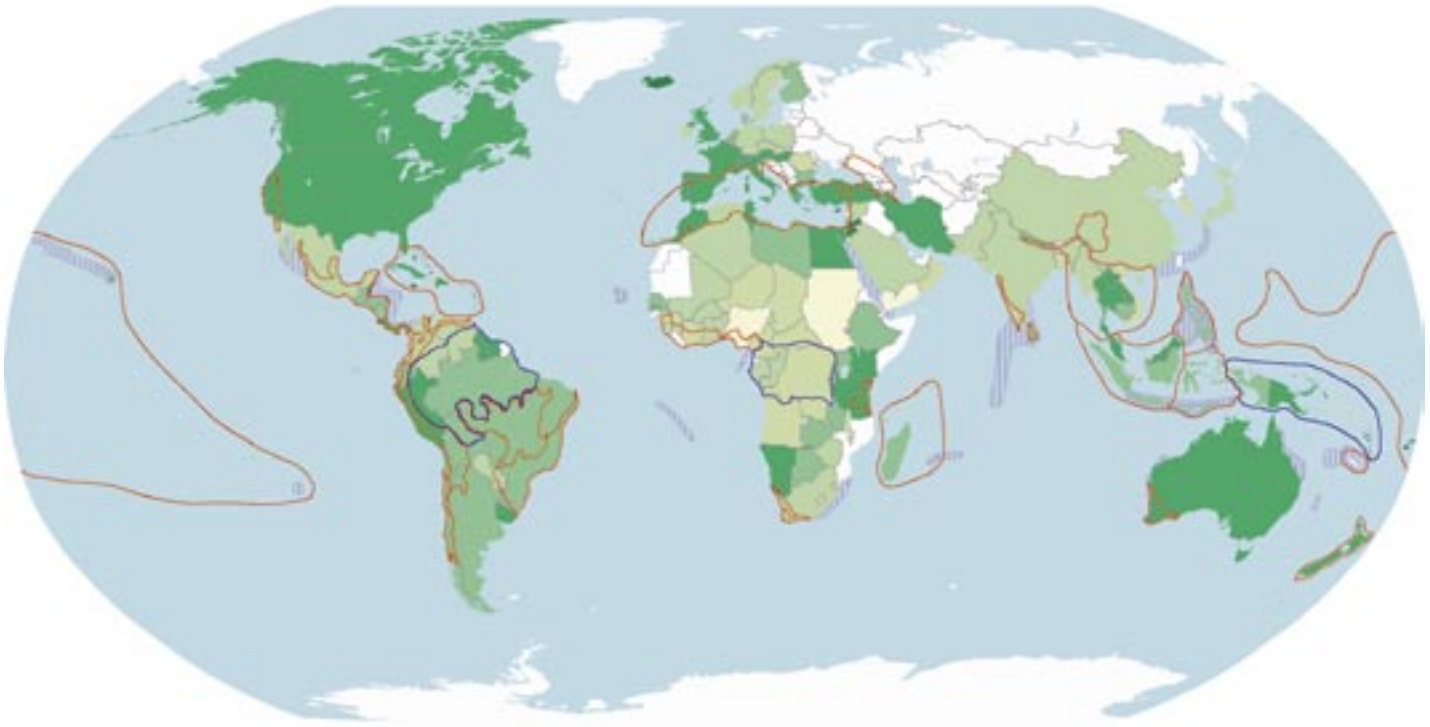
INTERNATIONAL TOURISM RECEIPTS IN MILLIONS OF U.S. DOLLARS

- Less than 500
- 500–2,000
- 2,000–6,000
- 6,000–10,000
- Over 10,000
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001*
Conservation International 2002
Cartography: M. Denil

*Data for each country may be for activity from the years 1990 through 2000. Data for the latest date available in each range were selected for display here.

Map 7: Tourism as a Percentage of Gross Domestic Product 1999



TOURISM AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT 1999

- Less than 1%
- 1%–2%
- 3%–4%
- 3%–4%
- 4%–8%
- 8%–47%
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Travel and Tourism Council 2002
Conservation International 2002
Cartography: M. Denil

incorporates some poverty reduction goals.

Developing countries currently have only a minority share of the international tourism market (approximately 30 percent), but their share is growing rapidly. International tourism arrivals in developing countries as a group have grown by an average of 9.5 percent per year since 1990, compared with 4.6 percent worldwide (Deloitte and Touche, IIED and ODI 1999). In these countries, tourism makes important contributions to the national economy through foreign exchange earnings, employment, and GDP. On average, international tourism receipts account for around 10 percent of export revenues of developing countries. The United Nations Conference on Trade and Development (UNCTAD) notes that tourism is a principal export of 49 least-developed countries and number one for 37 of them (Diaz Benevides and Perez-Ducy 2001). Tourism's contribution to GDP varies from 3 to 5 percent in Nepal and Kenya to 25 percent in Jamaica; contribution to employment is estimated at 6–7 percent in India and South Africa (Deloitte and Touche, IIED and ODI 1999).

Maps 6 and 7 illustrate the significance of tourism as a percentage of GDP in developing countries. The maps demonstrate that in the industrialized North, high levels of tourism receipts correlate to their significance in terms of GDP. In the less industrialized countries of the South, however, even low levels of tourism receipts can be very important to the national economy. In short, even modest levels of tourism, carefully planned and implemented, can be a positive force for biodiversity conservation and local economic benefit.

Although we cannot accurately determine the degree to which tourism is directly dependent on biodiversity, we can assume with confidence that in many hotspot countries, such as Australia, Belize, Brazil, Costa Rica, Kenya, Madagascar, Mexico, South Africa, and Tanzania, a significant proportion of tourism's GDP contribution can be directly linked to attractions and destinations in biodiversity hotspots, where biodiversity itself represents the primary tourism attraction.

Tourists prepare for a beach picnic in Zanzibar.

Tourism is clearly of great economic significance to developing countries. However, that significance varies widely from country to country, with those economies most dependent on tourism tending to be small island states: The Caribbean is the most tourism-dependent region in the world, and the Maldives the most tourism-dependent country. Although these countries are not the poorest in the world (they are classified by the World Bank as middle-income on the basis of indicators such as numbers of people living on less than US$1/day), they still contain significant numbers of impoverished people. Of the poorest 100 countries, however, well over half have a tourism industry that is growing and/or significant (Deloitte and Touche, IIED and ODI 1999). Table 2, below, shows 6 of the world's 15 poorest countries where tourism is significant or growing. All are in biodiversity hotspots.

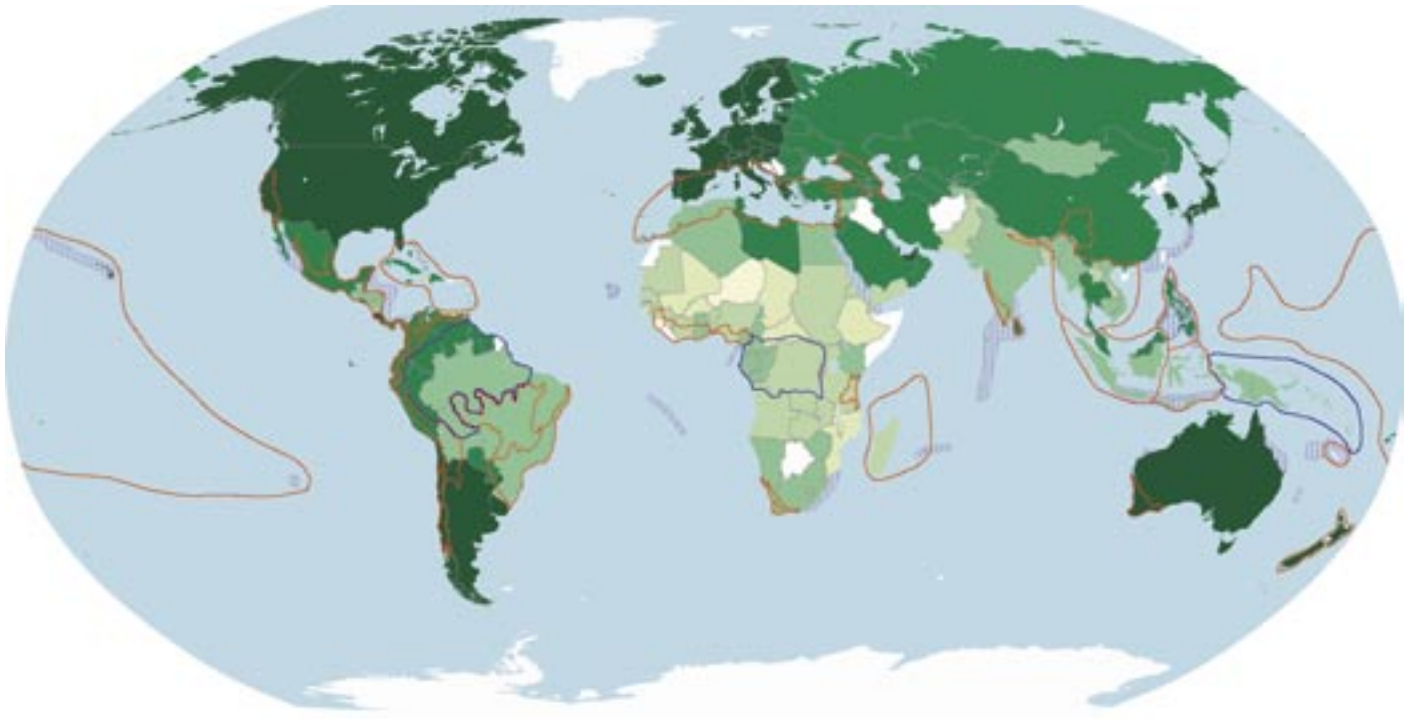
Up-to-date poverty data (from the World Bank Development

Table 2: Significance of International Tourism to Poor, Biodiversity-Rich Countries

Country	Hotspot	Percentage of population below US 1$ a day[a]	Percentage contribution of tourism industry to GDP[b]
Nigeria	Guinean Forest	70	0.5
Madagascar	Madagascar and Indian Ocean Islands	63	3.8
India	Western Ghats and Sri Lanka	44	2.5
Honduras	Mesoamerica	41	4.4
Ghana	Guinean Forest	39	5.5
Nepal	Indo-Burma	38	4.5

[a]World Bank 2001 World Development Indications
[b]WTTC Year 2001 Country League tables

Map 8: UNDP Human Development Index 2000



HUMAN DEVELOPMENT INDEX

- Below .3
- .4
- .5
- .6
- .7
- .8
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001*
(Tourism Market Trends)
Conservation International 2002
Cartography: M. Denil

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Indicators) are not available to plot a comprehensive map for all biodiversity hotspots. However, an analysis of tourism arrivals against the Human Development Index (HDI)[7] of the United Nations Development Programme (UNDP) serves to illustrate the overlap between levels of development, biodiversity, and tourism. In particular, several hotspot countries have a low HDI rating and high levels of visitation—for example, Brazil, Indonesia, and South Africa (Map 8). The map also illustrates the overlap between hotspots and countries with a low HDI rating (Cambodia, Gabon, Ghana, Guatemala, Indonesia, Ivory Coast, Madagascar, Papua New Guinea, southern Nigeria, Tanzania).

A key question that might be asked is, if these countries are apparently doing so well in tourism and are so well endowed with biodiversity, why are they still so poor? Some argue that because foreign, private sector interests often drive tourism, it has limited potential to contribute much to poverty elimination in developing countries. This can apply to biodiversity-based tourism, as well as other forms of tourism development. Tourism is often noted for having high levels of revenue "leakage," and of the revenue that is retained in the destination country, much is captured by rich or middle-income groups—not the poor. Tourism is also a volatile industry, being extremely susceptible to events that are difficult to control—natural disasters, exchange rate fluctuations, and political unrest. For example the 2002 terrorist bombing on the resort island of Bali led to an immediate drop in tourism arrivals and it was almost a year before tourism on Bali began to

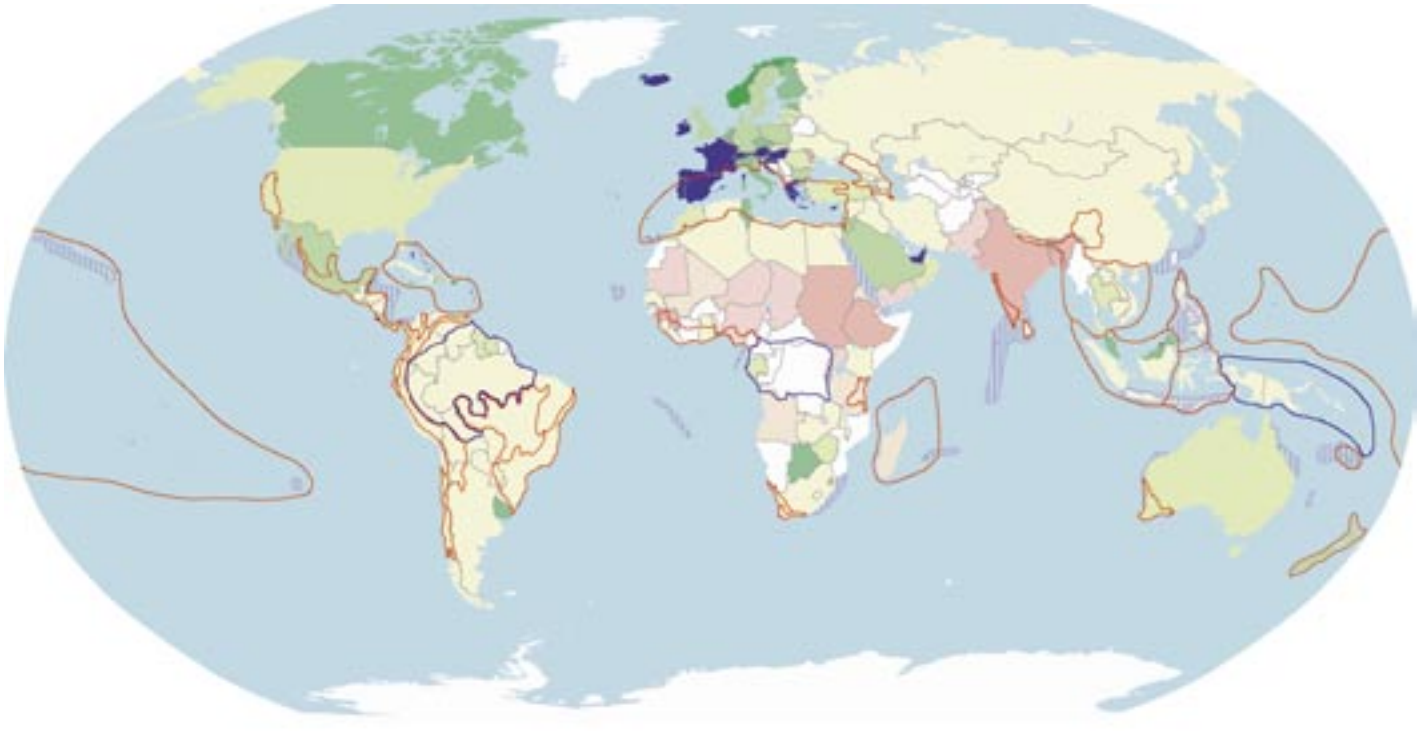
increase again. In poor countries, tourism can have a particular effect on the poor themselves, causing displacement, increased local costs, loss of access to resources, and social and cultural disruption.

Tourism does, however, have a major advantage over other forms of development (such as timber extraction, mining, etc.) with respect to biodiversity conservation and poverty reduction: Not only is tourism highly dependent on the natural and cultural environment—assets that the poor have and on which they can capitalize—but, properly managed, it can contribute to biodiversity conservation, which can directly support poverty reduction.[8] Strategies for making tourism more "pro-poor" have shown some success at the local level (Ashley et al. 2001). Scaling these approaches up and applying them to biodiversity-based tourism could result in positive synergies between tourism growth, biodiversity conservation, and human development in the future.

2.4: Analyzing the Maps to Assess Impacts

The ratio of visitors to local residents (Map 9) is used by the World Tourism Organization as a core indicator of the social impact of tourism, and the map below illustrates that this ratio can be extraordinarily high in some countries, with tourists outnumbering local residents in certain areas. Hotspot countries or areas that stand out are Australia, Botswana, Eastern Caribbean, New Zealand, northern Mediterranean, Malaysia, Mexico, and Uruguay. Furthermore, as Map 5 illustrates, tourism is likely to increase in the next 20 years, including in areas where visitor pressure is already high. It should be noted, however, that this visitor-to-resident ratio is an extremely rough measure of impact. The local distribution of the tourists, the activities they engage in, and the cultural differences between tourists and residents need

Map 9: Arrivals as a Percentage of Population



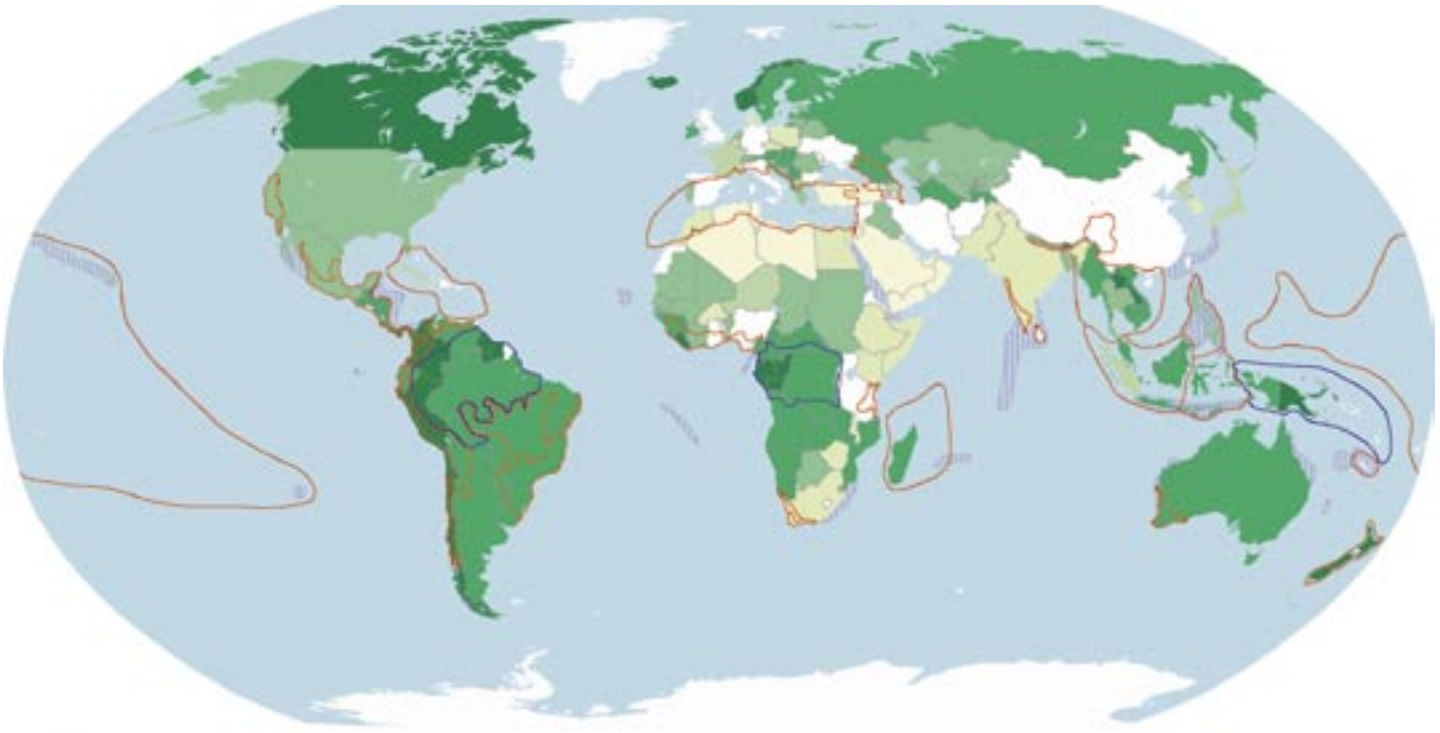
TOURISM ARRIVALS AS A PERCENTAGE OF POPULATION

- Less than 0.3%
- 0.6%
- 1%
- 10%
- 20%
- 40%
- 60%
- 80%
- 100% to about 4500%
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2002*
Conservation International 2002
Cartography: M. Denil

*Data gaps where filled by calculation of WTO international arrivals with population data.

Map 10: Freshwater Resources per Capita 2000



FRESHWATER RESOURCES CUBIC METERS PER CAPITA

- Fewer than 1,000
- 1,000–2,000
- 3,000–4,000
- 4,000–10,000
- 10,000–50,000
- More than 50,000
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Bank
Conservation International 2002
Cartography: M. Denil

to be considered as well, before the potential impact can be fully assessed.

The ratio of tourists to local residents can be used in conjunction with other data to highlight potential environmental impacts. Water use, for example, can be a serious issue with respect to tourism development. Map 10 shows that in some countries the availability of freshwater resources is very limited, yet some of these countries have tourism intakes far higher than their total population. Tunisia, for example, is conspicuous as a country within the Mediterranean hotspot with limited per capita freshwater resources and very high tourist-to-resident ratios. The Caribbean, Mexico, and South Africa also stand out as hotspot areas with high levels of visitation (and sustained growth in visitation over the 1990s) and low levels of available fresh water.

Water use is a particular problem associated with hotels, as tourist consumption of water is often many times higher than that of the local people. This can result in water shortages and degradation of water supplies, as well as increased wastewater discharge, all of which can affect wetlands. The problem is particularly acute in hot, dry countries (both in the North and South), where available resources can be in short supply, yet tourist demands on water (for swimming pools, showers, etc.) are high because of the climate. The vast quantities of water required to maintain golf courses (a rapidly increasing form of tourism in the South) is another issue of concern. An average golf course soaks up at least 525,000 gallons of water per day (Tourism Concern, Golf Campaign, 2003), which can severely affect fresh water availability in certain areas.

Aerial view of resorts lining the beach of Cancun Island, Mexico.

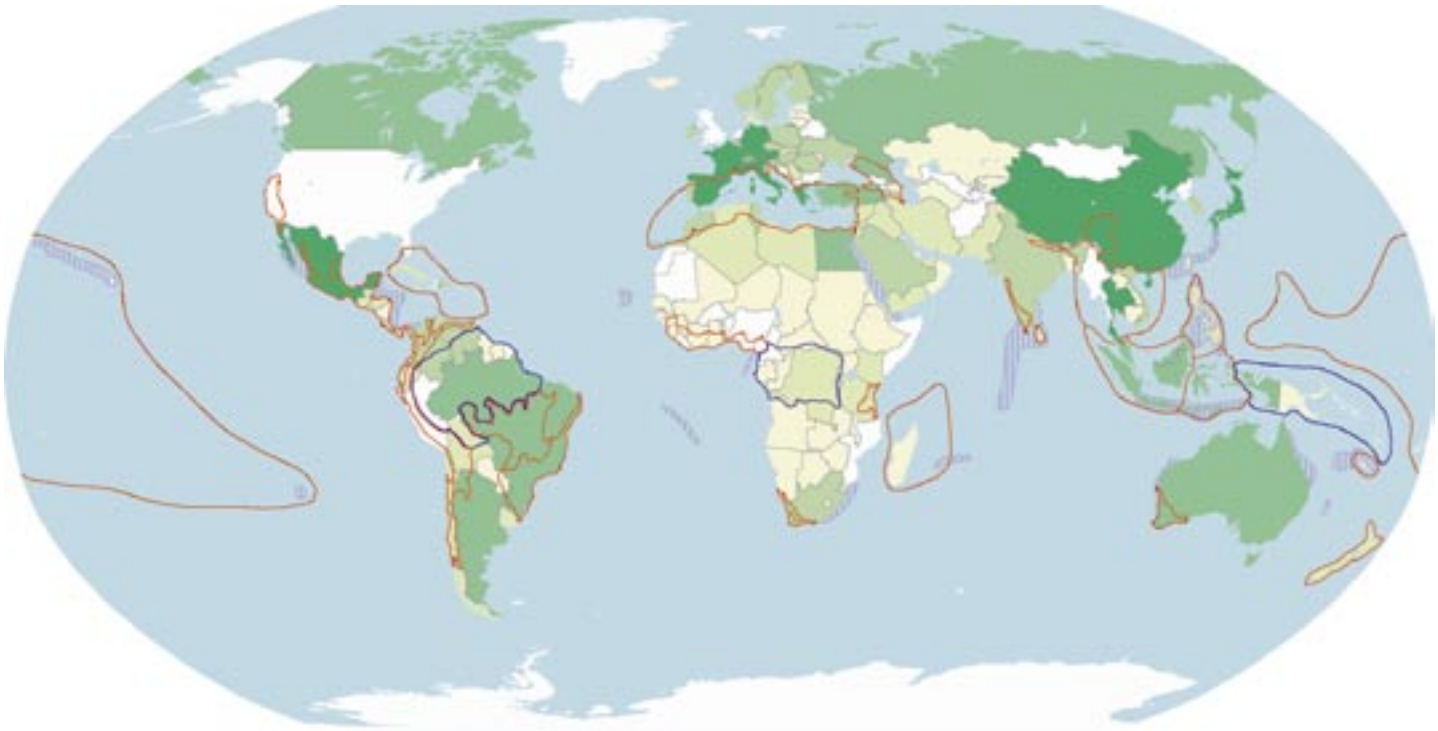
Box 5: Cancun, Mexico: The Impact of Tourism Development

Prior to its development as a tourist resort in the 1970s, only 12 families lived on the barrier island of Cancun. The entire area that now comprises the state of Quintana Roo was made up of relatively untouched rain forests and pristine beaches and was inhabited by an indigenous Maya population of about 45,000.

Today, Cancun has more than 2.6 million visitors a year and has more than 20,000 hotel rooms, with a permanent population of more than 300,000. Environmental and social impacts were given secondary importance in the development plan for Cancun. For instance, no provisions were made to house low-income migrants who now work and live in the area. As a result, a shantytown developed, in which the sewage of 75 percent of the population is untreated. The mangrove and inland forests were cut down, swamps and lagoons were filled, and dunes were removed. Many bird, marine, and other animal species vanished.

(Sweeting et al. 1999)

Map 11: Hotels and Other Facilities—Rooms Circa 2000



HOTELS AND OTHER FACILITIES (THOUSANDS OF ROOMS)

- Fewer than 10
- 10–50
- 50–100
- 100–300
- 300–1,600
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001*
Conservation International 2002
Cartography: M. Denil

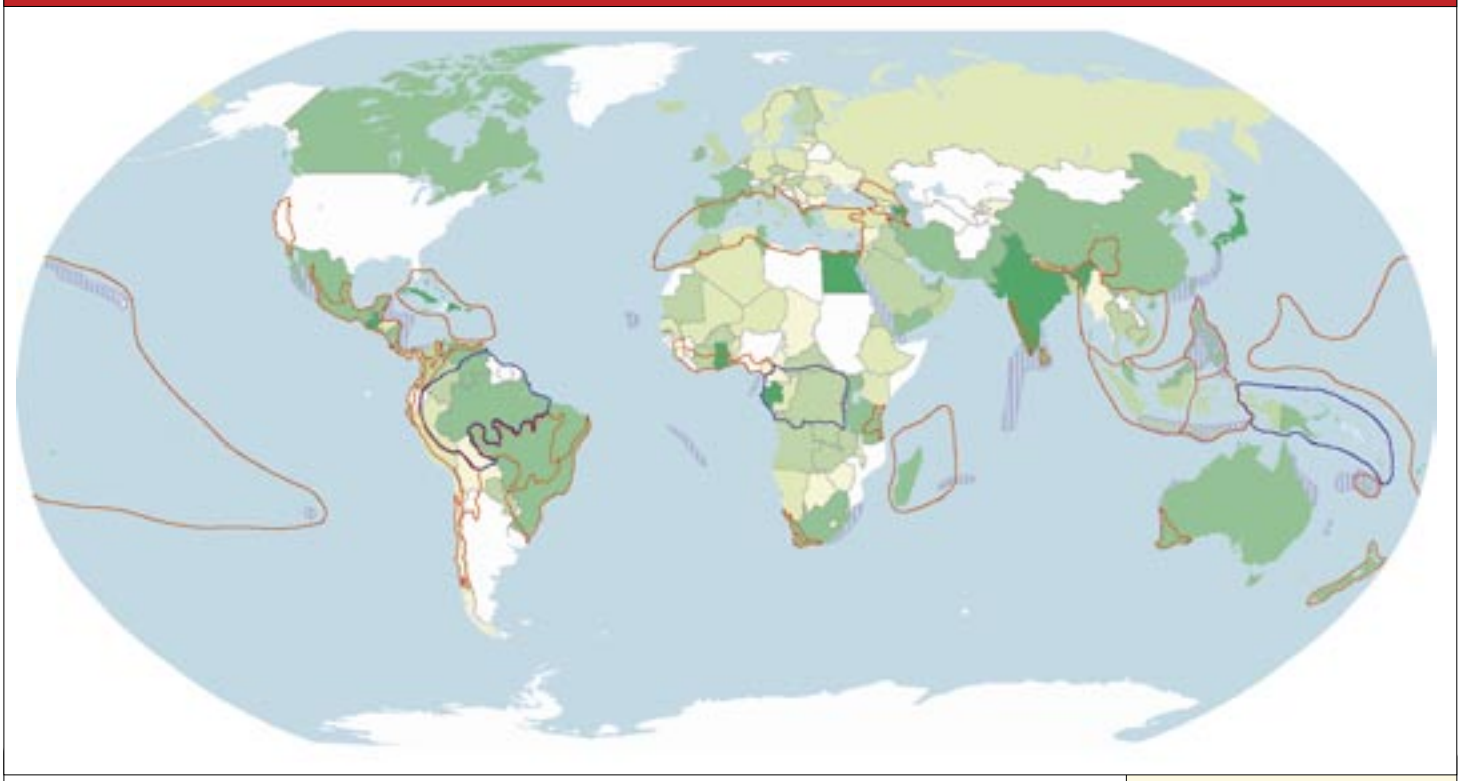
*Data for each country may be for activity from the years 1995 through 2000. Data for the latest date available in this range were selected for display here.

Map 5 forecasts increased tourist arrivals in the arid countries of North Africa and the Middle East, where the tourist-to-resident ratio is already very high, and in the hotspot region of the Mediterranean. The conclusions that can be drawn from these maps are somewhat limited, since some very dry countries have a very small population (e.g., Namibia) and so do not show up as a problem on Map 10. However, they are highly vulnerable to an increase in water use as a result of tourism or any other extractive use and serve to highlight some of the pressures that can be associated with an increase in tourism. Thus, the forecast map emphasizes the need for proper planning if continued growth of tourism is not to impinge even further on water availability and its relationship to biodiversity-rich wetlands and the well-being of local residents.

Maps 11 and 12, depicting the scale of hotel development and levels of occupancy, are also useful indicators of potential impacts—especially in light of the connection between hotel development and water use highlighted above. Some countries appear to have overdeveloped their hotels. Thailand, for example, shows a high level of capacity and low level of occupancy (less than 50 percent). Indonesia also shows a similar low level of occupancy and high-level capacity, although arrivals are projected to grow dramatically through to 2020.

Bearing in mind the environmental impacts associated with building and infrastructure development and the potential consequences for biodiversity conservation, this should be a point of concern in hotspot countries, and it underscores the need for careful planning of any further develop-

Map 12: Hotels and Other Facilities—Occupancy Rates Circa 2000



HOTELS AND OTHER FACILITIES OCCUPANCY RATE

- Less than 30%
- 30%–40%
- 40%–50%
- 50%–65%
- 65%–83%
- Hotspots
- Major Tropical Wilderness Areas
- Coral Reef Hotspot Areas
- Open water
- No data for study year

Scale: 1/190,000,000
Projection: Robinson
Data: World Tourism Organization 2001*
Conservation International 2002
Cartography: M. Denil

*Data for each country may be for activity from the years 1990 through 2000. Data for the latest date available in each range were selected for display here.

ment. The mass tourist resort of Cancun in Mexico is an example of the negative impact that poorly planned large-scale developments can have (see Box 5). On the other hand, it could be argued that, on a wider scale, it is better to concentrate tourism development into a relatively small area (such as Cancun), thus restricting, spatially, its impact. This can work even with large tourism developments if they are designed in an environmentally friendly manner and revenue from them is used to support biodiversity conservation elsewhere. However, maintaining the concentration of large tourism developments in specific destinations and avoiding other tourism-related sprawling developments, especially along coastlines, has proven largely unsuccessful. It is not necessarily the scale of tourism development that is key to its impact (both positive and negative), but rather the way it is planned and managed according to the principles of environmental sustainability.

Map 12 shows high levels of hotel occupancy in the Caribbean. While on the one hand this illustrates that infrastructure has not been developed unnecessarily, unlike some areas, it also emphasizes the high levels of tourist traffic in this region and the potential effect of related social impacts.

Endnotes

[5]Limitations of the data prevent a thorough analysis of the significance of this growth, because an increase from very low levels to only slightly higher levels shows up as significant when presented as a percentage increase.

[6]As noted earlier, it is not the total volume so much as the distribution and activities of tourists, and the location and scale of infrastructure that is developed to support them, that are important in determining their impacts on biodiversity.

[7]The HDI is a composite of three basic components of human development: longevity, knowledge, and standard of living.

[8]See Koziel and McNeill in the IIED Opinion Paper series for a discussion of how biodiversity can contribute to the Millennium Development Goals.