

# MARINE FISH CONSUMPTION

FISH is the primary source of protein for 950 million people and forms an important part of the diet of many more. About a third of global fish production is processed into fish meal or oil, most of which is fed to animals. Three-quarters of the fish eaten or otherwise consumed are marine fish, caught from the wild, rather than freshwater fish or farmed fish. Overfishing is causing many fish stocks to decline, especially in the North Atlantic.

The average marine fish catch for 1990-1995

was 84 million tonnes per year, double what it was in 1960 (Figure 16). On top of this, at least 27 million tonnes per year of by-catch – unwanted fish – were caught and discarded, putting the minimum estimate of fish caught at more than 110 million tonnes a year.

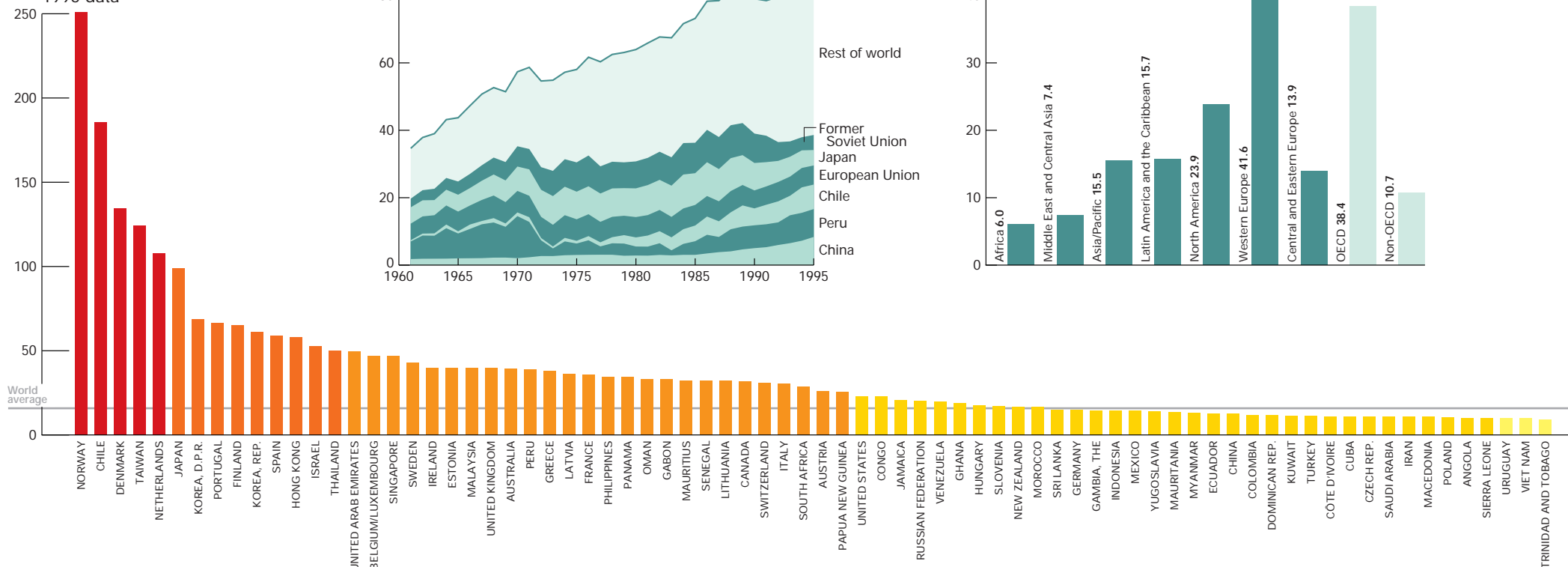
The UN Food and Agriculture Organization estimated that, in 1994, 60 per cent of the world's fish resources were either fully exploited or in decline. The FAO also estimates that the maximum sustainable potential of the oceans

is between 82 and 100 million tonnes a year, equivalent to about 14kg-17kg of fish per person per year for a world population of about 6 billion. Current levels of marine production will therefore lead to further declines in fish stocks.

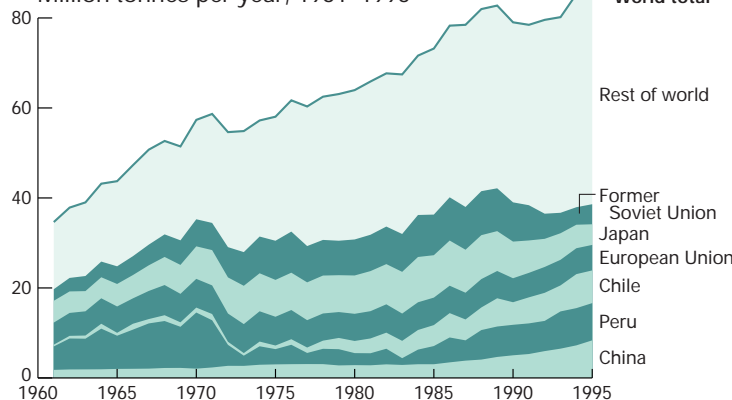
The data used in Figures 17 and 18 and Map 7 include shellfish, finfish, and fish that is processed into oil or meal for animal feed, as well as fish consumed as food. Freshwater fish are not included, nor is by-catch as this is difficult to attribute to a consumer country.

**WWF recommendations to reduce pressure on marine fisheries** ■ Stop overfishing by limiting fishing effort and access to fisheries, and allowing depleted stocks to recover. ■ Eliminate destructive fishing practices and the wasteful discarding of by-catch by commercial fishing operations. ■ Develop social and economic incentives for the sustainable management of fisheries, such as independent certification under the auspices of the Marine Stewardship Council. ■ Remove government fishing subsidies and decommission excess fleet capacity. ■ Establish and maintain no-fishing zones to serve as insurance against unsustainable fishing elsewhere.

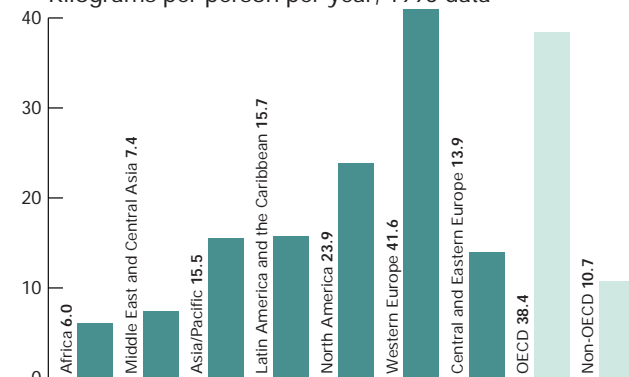
**Fig. 18:**  
**CONSUMPTION BY COUNTRY**  
Kilograms per person per year,  
1995 data

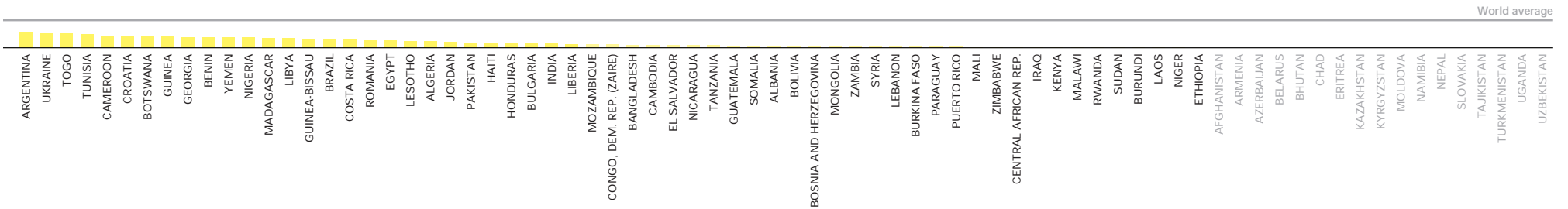
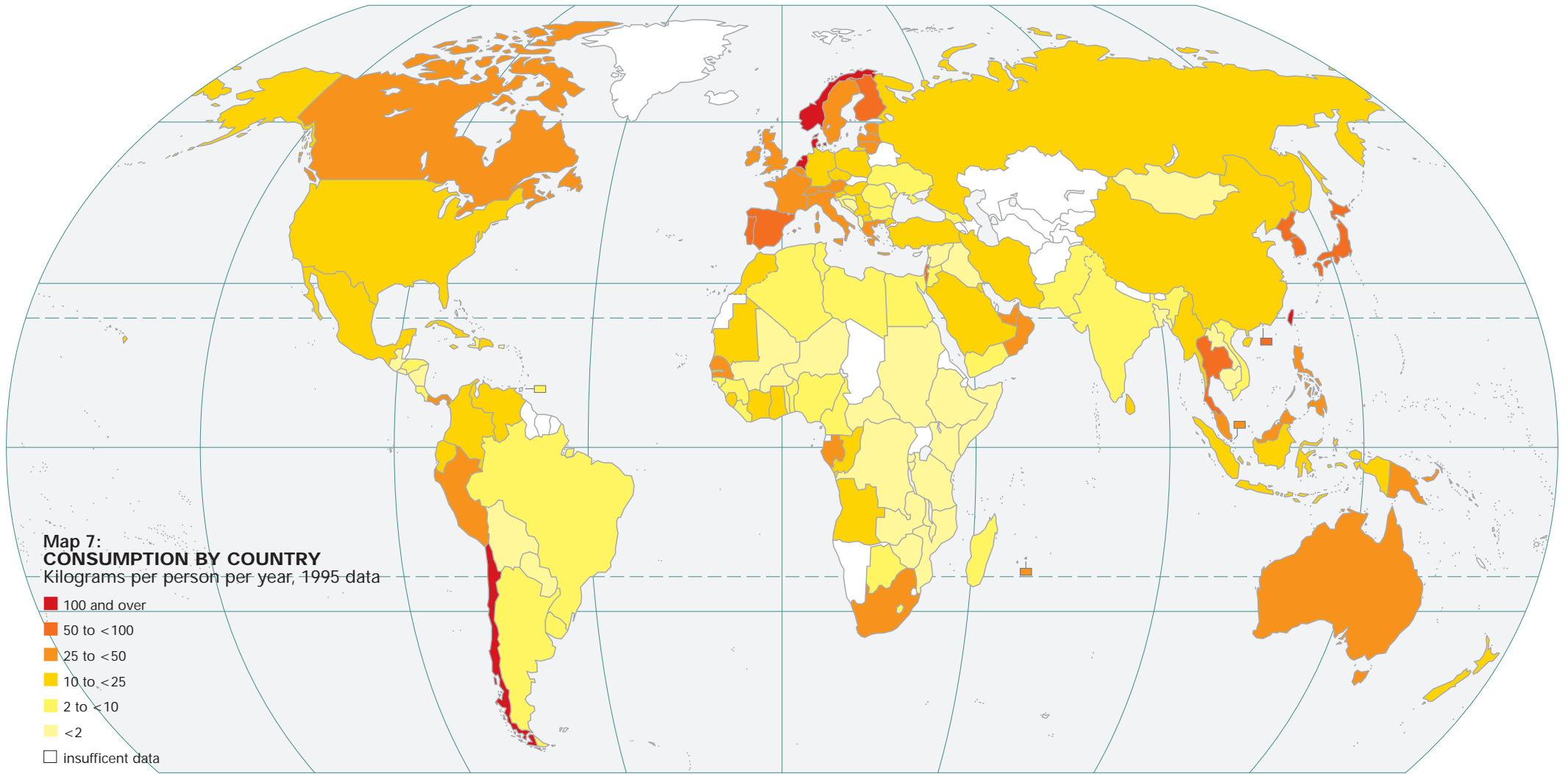


**Fig. 16:**  
**PRODUCTION BY MAJOR COUNTRY/REGION**  
Million tonnes per year, 1961-1995



**Fig. 17:**  
**CONSUMPTION BY REGION**  
Kilograms per person per year, 1995 data





# WOOD CONSUMPTION

WOOD is a versatile material: as a fuel it is the most important source of energy for 2 billion people; as timber it can be made into plywood, veneers, and other sawnwood, or chipped to make wood-based panels; or it can be pulped to make paper. To produce wood, the world needs forests, but the world's forests are currently facing two critical problems: diminishing size and declining biological quality as a result of the conversion of natural forests into plantations. This is partly

because of inadequate forest protection and unsustainable management and partly because of the wasteful consumption of wood and paper.

World wood production has increased by two-thirds since 1960 (Figure 19). In 1995, consumption of fuelwood, industrial roundwood, pulp, and paper globally was about 3.5 billion m<sup>3</sup>, or 0.6m<sup>3</sup> per person per year. Even so, the world's forests, if managed well, could still provide more than enough wood. Global consumption, however, is characterized

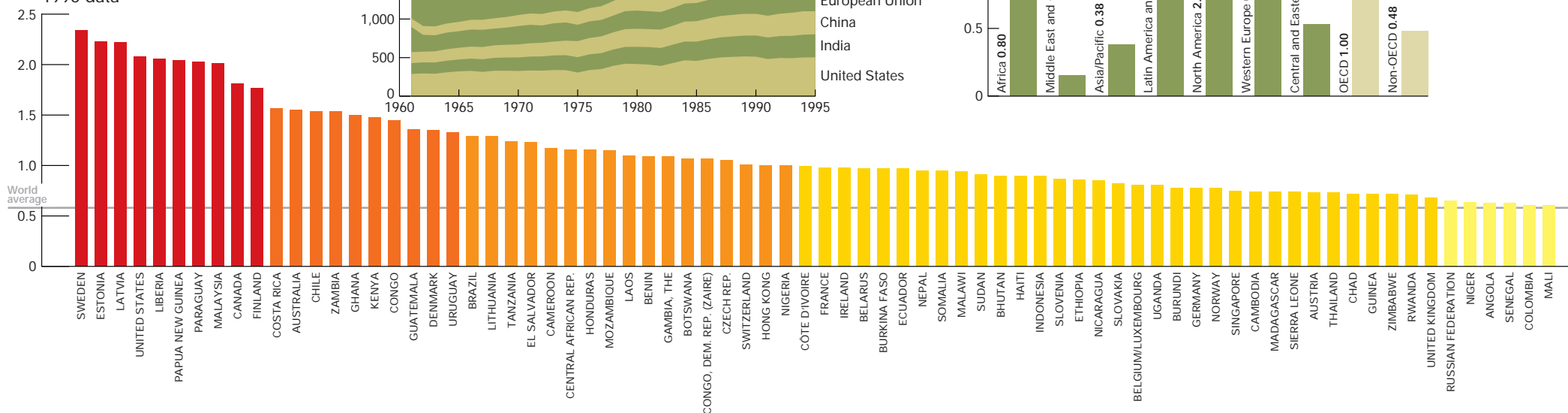
by extremes of consumption between countries, with 18 countries consuming more than twice the world average, and 49 consuming less than half the world average.

Figures 20 and 21 and Map 8 are calculated in cubic metres from data on national production, imports, and exports of wood and wood products. Pulp and paper consumption, which is measured in tonnes, has been converted back into cubic metres of wood raw material equivalent.

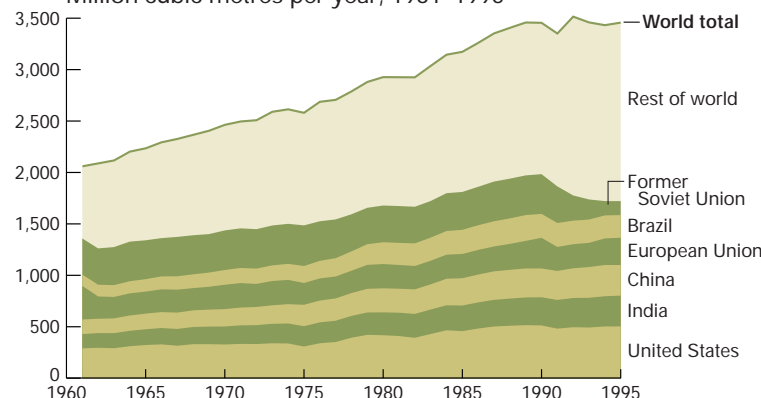
**WWF recommendations to reduce pressure on forests**

- Establish a network of ecologically representative protected areas covering at least 10 per cent of each forest type.
- Ensure forests outside protected areas are well managed according to standards set by the Forest Stewardship Council.
- Develop ecologically and socially appropriate forest restoration programmes.
- Reduce forest damage from pollution and climate change.
- Use forest goods and services within the regenerative capacity of the forest estate and eliminate the wasteful consumption of wood.

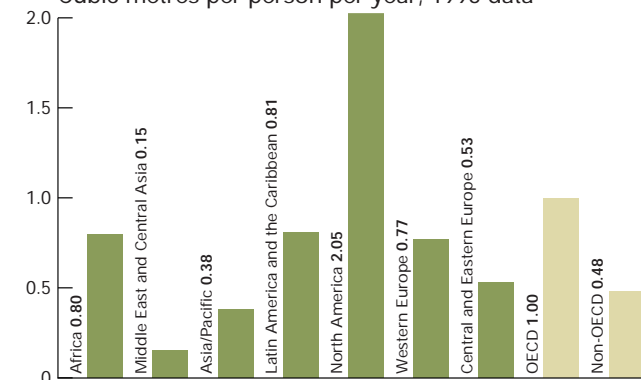
**Fig. 21:**  
**CONSUMPTION BY COUNTRY**  
Cubic metres per person per year, 1995 data

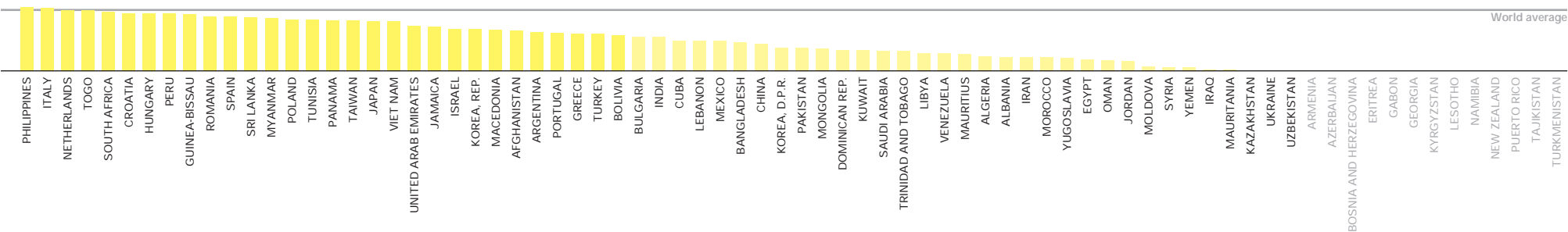
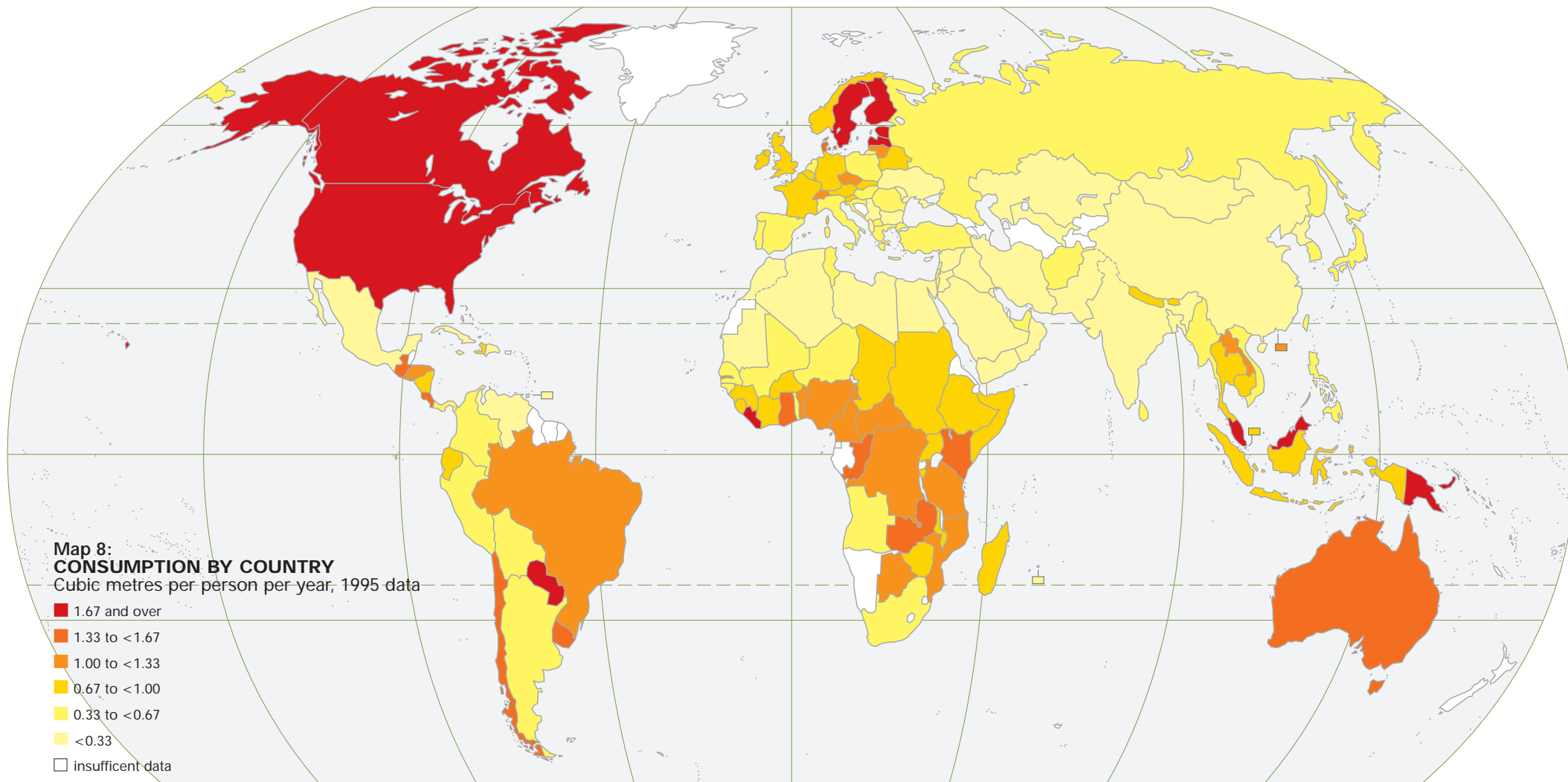


**Fig. 19:**  
**PRODUCTION BY MAJOR COUNTRY/REGION**  
Million cubic metres per year, 1961–1995



**Fig. 20:**  
**CONSUMPTION BY REGION**  
Cubic metres per person per year, 1995 data





# FRESHWATER WITHDRAWALS

FRESHWATER is essential to human health, agriculture, industry, and natural ecosystems, but is now running scarce in many regions of the world. Natural ecosystems, especially wetlands and natural forests, capture water and even out seasonal flows as well as recharging groundwater and improving water quality. Conserving natural ecosystems is vital to maintaining the supply of freshwater. Conversely, the overuse of freshwater has adverse impacts on natural ecosystems.

Global freshwater withdrawals have almost doubled since 1960 (Figure 22). It is estimated that humanity now uses more than half of all accessible freshwater runoff – the source of all water for irrigation, industrial, and municipal uses as well as instream uses such as the maintenance of freshwater fisheries and hydroelectric power generation.

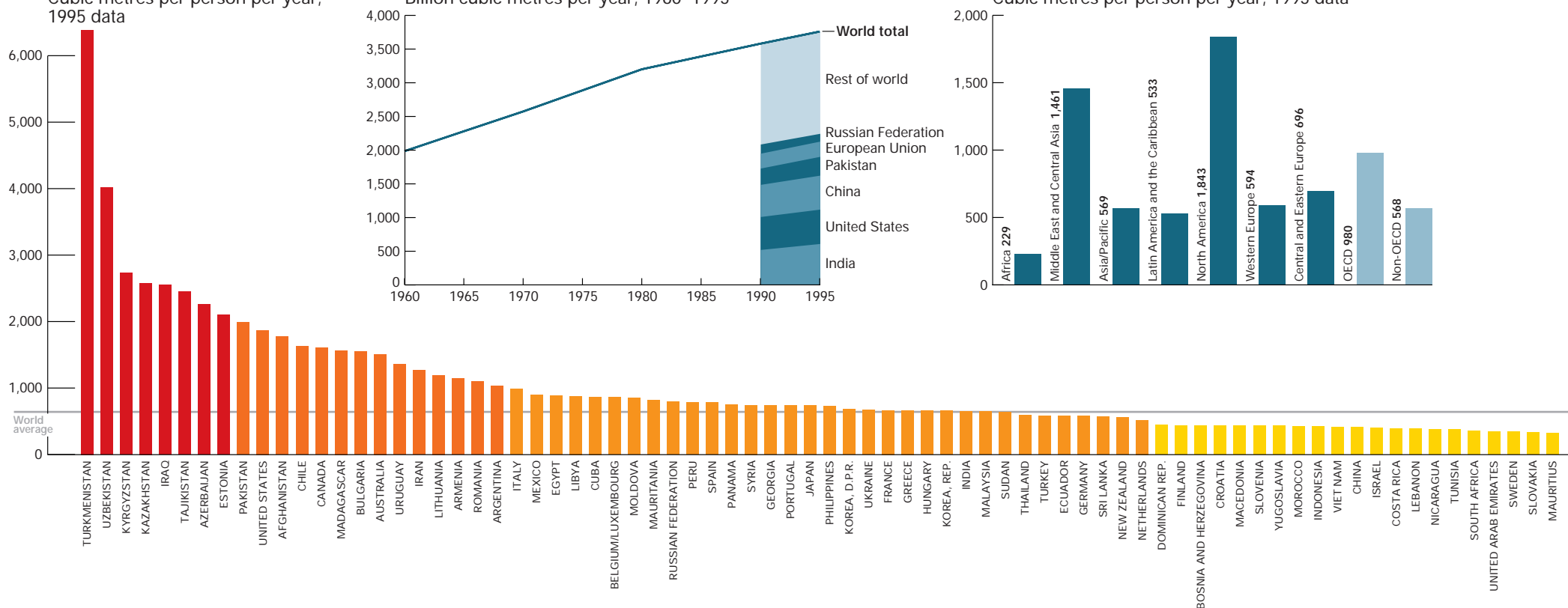
Figures 23 and 24 and Map 9 show annual withdrawals of freshwater per person

by country and region, combining agricultural, industrial, and municipal uses – but excluding instream uses. Of course, some parts of the world have abundant water resources while others are chronically short of freshwater, so high per person usage in a particular country is not necessarily an indicator of unsustainable consumption. Even in countries that have generally abundant water, however, high levels of consumption often lead to localized shortages.

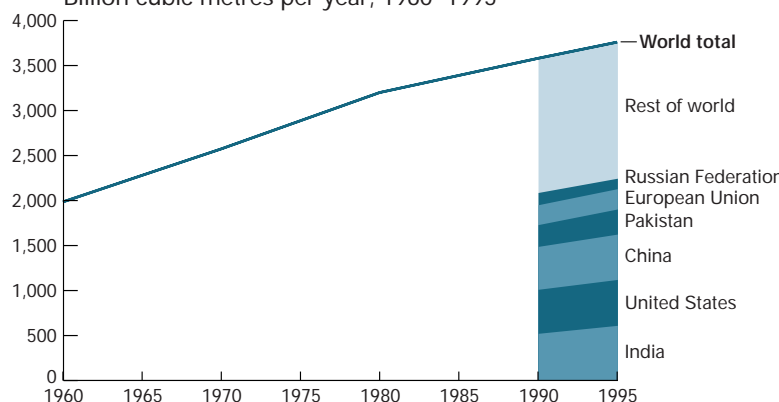
**WWF recommendations to reduce pressure on freshwater ecosystems and meet basic human needs**

- Conserve and restore freshwater ecosystems to maintain their hydrological functions.
- Manage water resources on a catchment area basis, taking into account land-use practices that may have an impact on the quality or quantity of surface or groundwater.
- Establish protected wetland areas and designate important sites under the Convention on Wetlands.
- Increase water-use efficiency, especially in the agricultural sector where water losses are highest.
- Improve water quality through pollution prevention – particularly a reduction of synthetic chemicals entering freshwater bodies – and wastewater treatment.

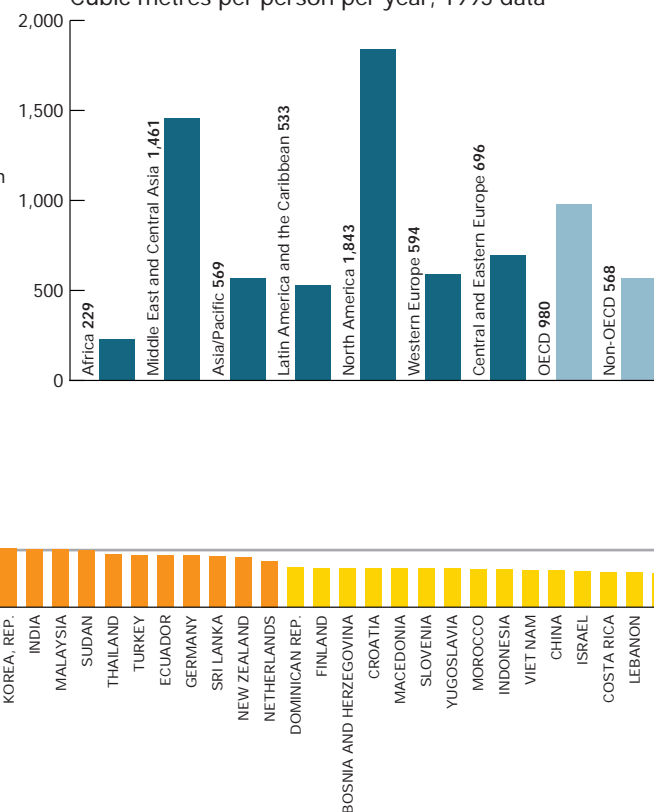
**Fig. 24:**  
**WITHDRAWALS BY COUNTRY**  
Cubic metres per person per year, 1995 data

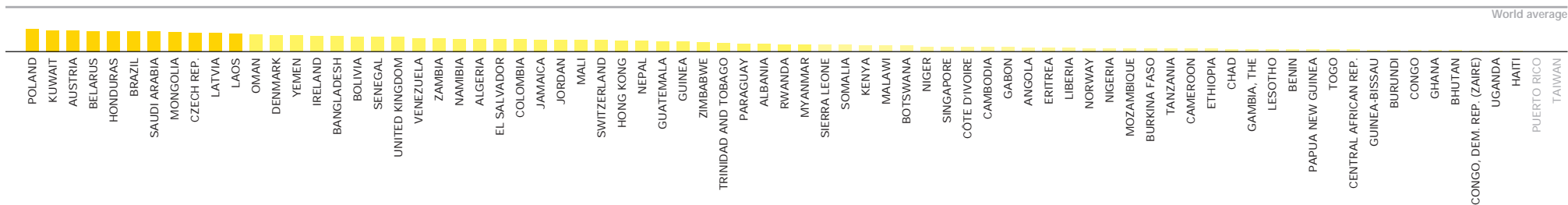
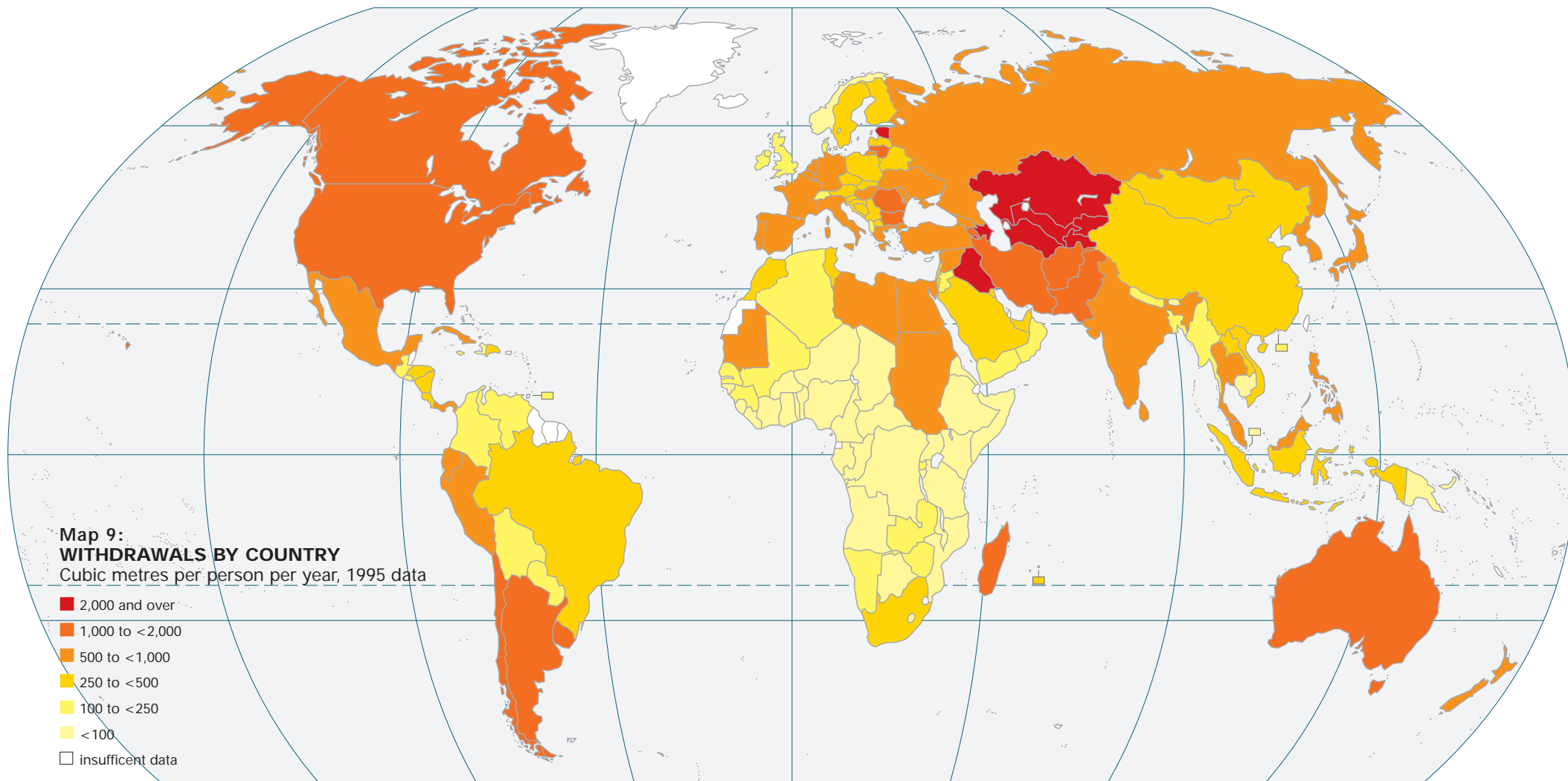


**Fig. 22:**  
**WITHDRAWALS BY MAJOR COUNTRY/REGION**  
Billion cubic metres per year, 1960–1995



**Fig. 23:**  
**WITHDRAWALS BY REGION**  
Cubic metres per person per year, 1995 data





# CARBON DIOXIDE EMISSIONS

THE emission of carbon dioxide (CO<sub>2</sub>) to the atmosphere from fossil fuel combustion is a principal cause of global climate change and also a reasonably good indicator of other air pollution – particularly nitrogen oxides and sulphur dioxide emissions. Fossil fuels – coal, oil, and natural gas – provide about 90 per cent of the world's commercial energy used for electricity generation, transport, industry, and in homes and businesses.

Global CO<sub>2</sub> emissions more than doubled

between 1960 and 1995, from less than 10 billion tonnes per year to more than 23 billion tonnes per year (Figure 25). This does not include the emissions from deforestation which add between 2 billion and 10 billion tonnes per year.

The concentration of CO<sub>2</sub> in the atmosphere is climbing to a dangerous level. To stabilize the atmospheric concentration, the scientific community believes that global CO<sub>2</sub> emissions would have to be cut by about

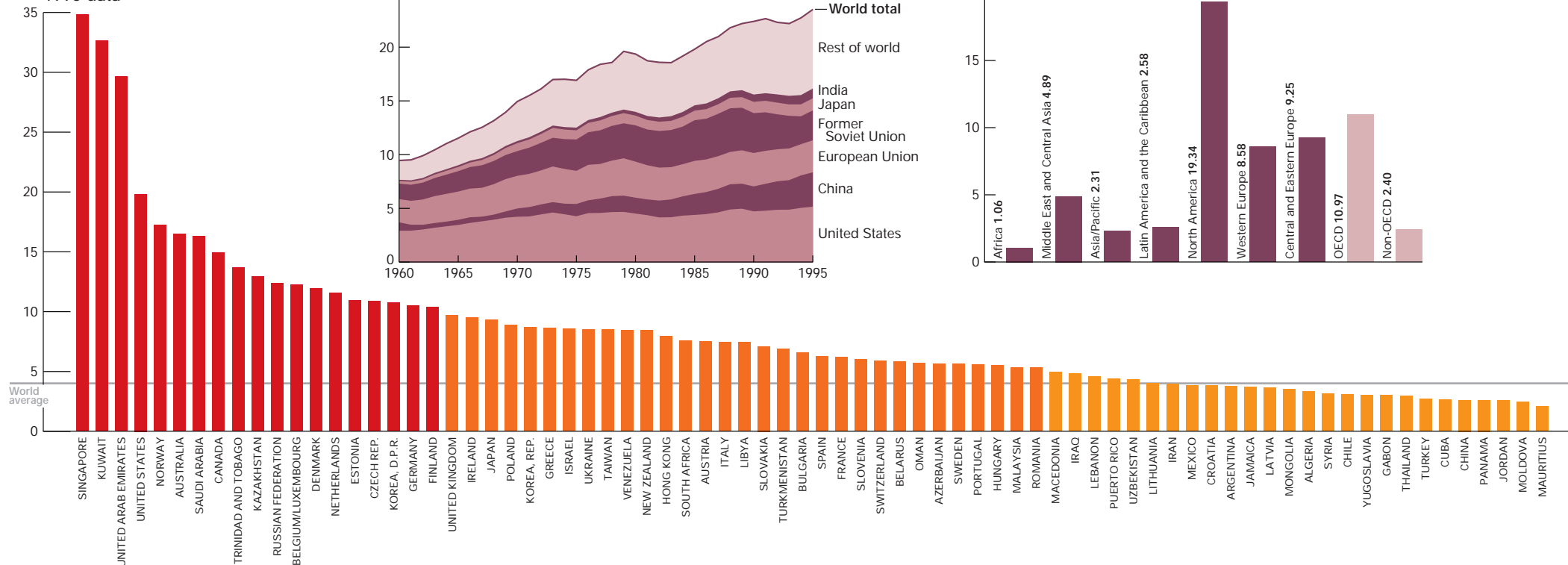
60 per cent, to a level that is within the capacity of the oceans and terrestrial ecosystems, especially forests, to remove CO<sub>2</sub> from the atmosphere.

On average, each person in the world burns enough fossil fuels to emit about 4 tonnes of CO<sub>2</sub> per year (Figure 27). Yet, as Figure 26 and Map 10 show, per person CO<sub>2</sub> emissions in North America are around 20 tonnes per year, double the European average and eight times the developing world average.

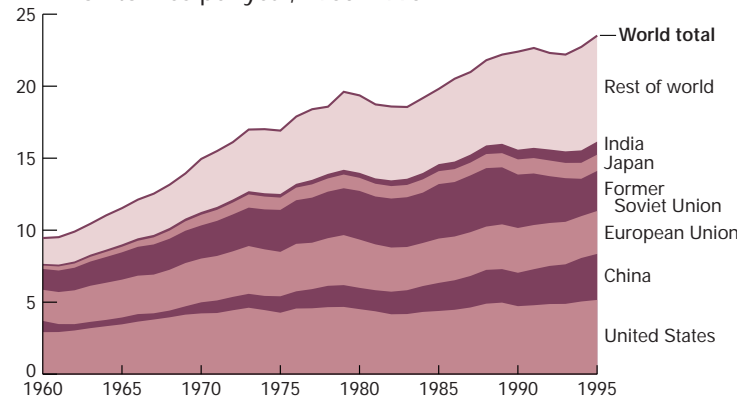
**WWF recommendations to reduce energy consumption and CO<sub>2</sub> emissions**

- Increase the use of energy-saving technologies and eliminate wasteful energy consumption in transport, industry, and the home.
- Increase the supply of energy from sources which reduce or eliminate pollution, especially renewable sources such as solar and wind.
- Assist developing countries to invest in sustainable energy technologies as they industrialize.
- Increase energy prices to cover the full environmental costs of energy use, and remove government subsidies on energy.
- Stop deforestation and promote reafforestation of deforested areas in an ecologically and socially appropriate manner.

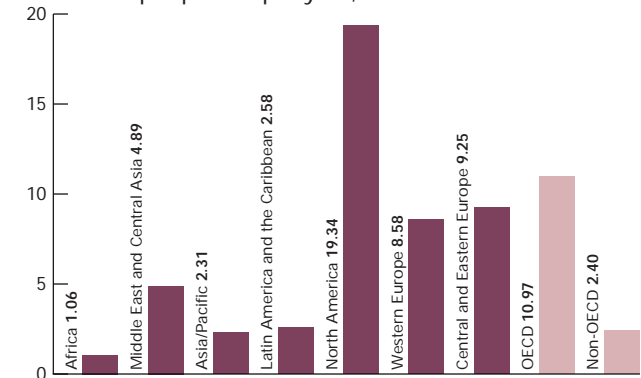
**Fig. 27:  
EMISSIONS BY COUNTRY**  
Tonnes per person per year,  
1995 data



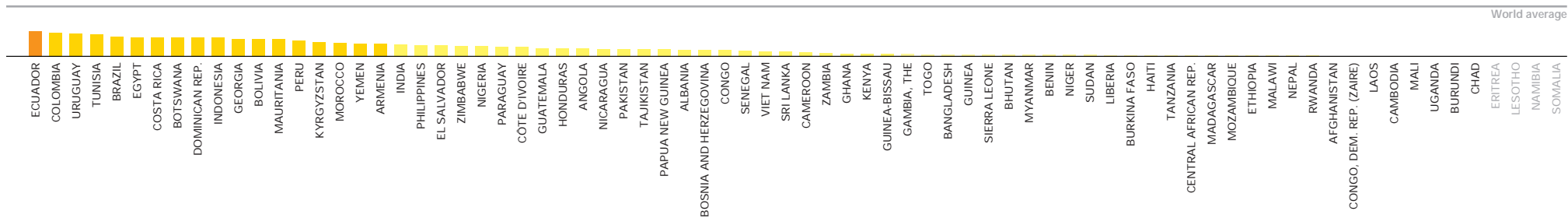
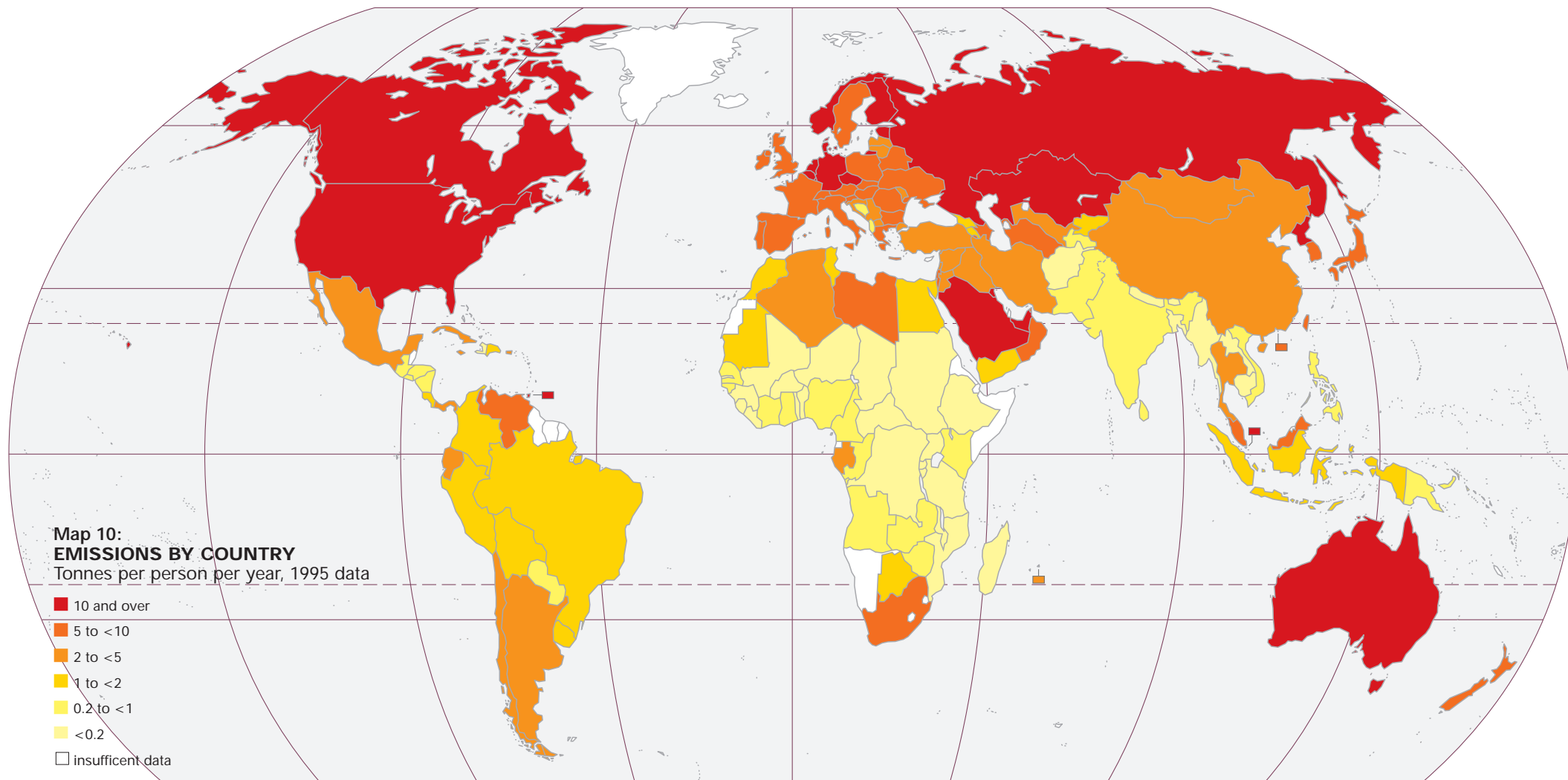
**Fig. 25:  
EMISSIONS BY MAJOR COUNTRY/REGION**  
Billion tonnes per year, 1960–1995



**Fig. 26:  
EMISSIONS BY REGION**  
Tonnes per person per year, 1995 data









# CEMENT CONSUMPTION

A SIGNIFICANT cause of biodiversity loss which is not covered by the other components of Consumption Pressure is the loss of natural habitat, forest, and farmland to urban expansion, infrastructure development, and mining. Most countries do not produce data on the amount of land that is lost each year in these ways, so cement consumption has been used as a very approximate measure of construction and road building, and of aggregates extraction.

World cement consumption has increased more than fourfold since 1960 (Figure 28). The raw materials used for construction are not likely to become scarce at current rates of extraction and urban areas still only make up a small proportion of the world's land area, so it is not realistic to suggest a sustainable limit. But urban encroachment is a serious problem both in industrialized countries and the developing world, where the

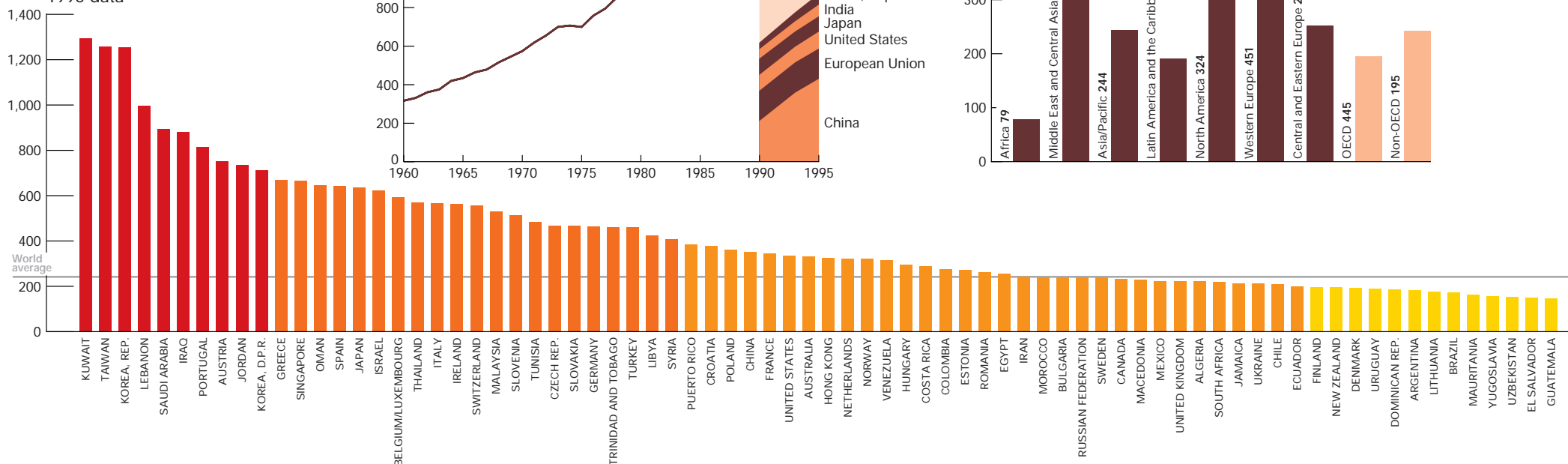
physical size of cities is predicted to double between 1980 and 2000.

Figures 29 and 30 and Map 11 show that world average cement consumption was about 250kg per person per year in 1995, with almost 50 countries above that average. National data on cement production have been used where data on consumption are not available.

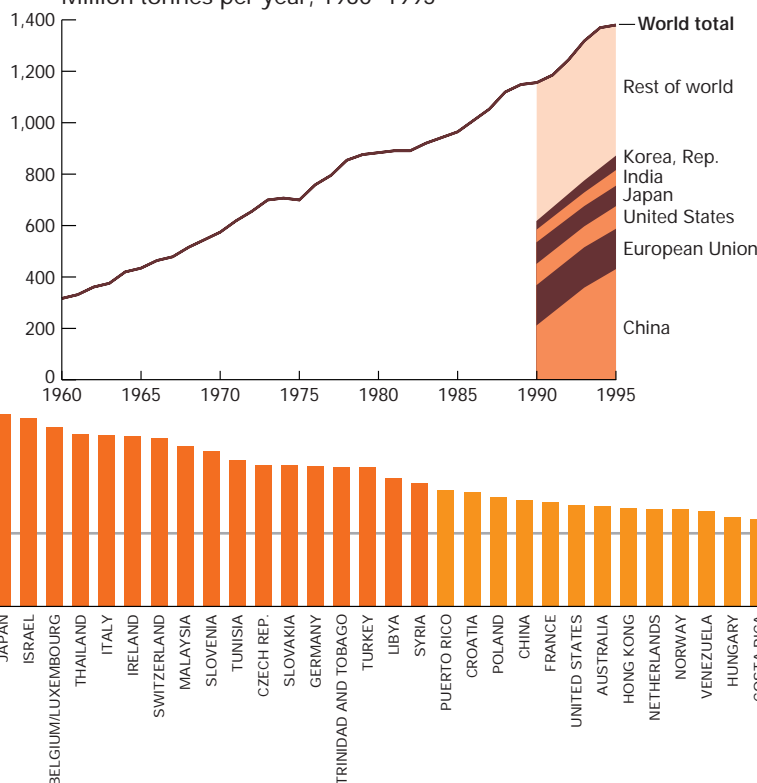
## WWF recommendations to reduce land consumption and control urbanization

- Use industrial and residential zoning and greenbelt controls to regenerate inner cities and reduce urban sprawl. ■ Promote compact cities and car-free zones to minimize transport and energy demand as well as land take.
- Integrate transport and land-use planning and promote transport by rail or water rather than road. ■ Protect ecologically sensitive areas near human settlements and mining operations.

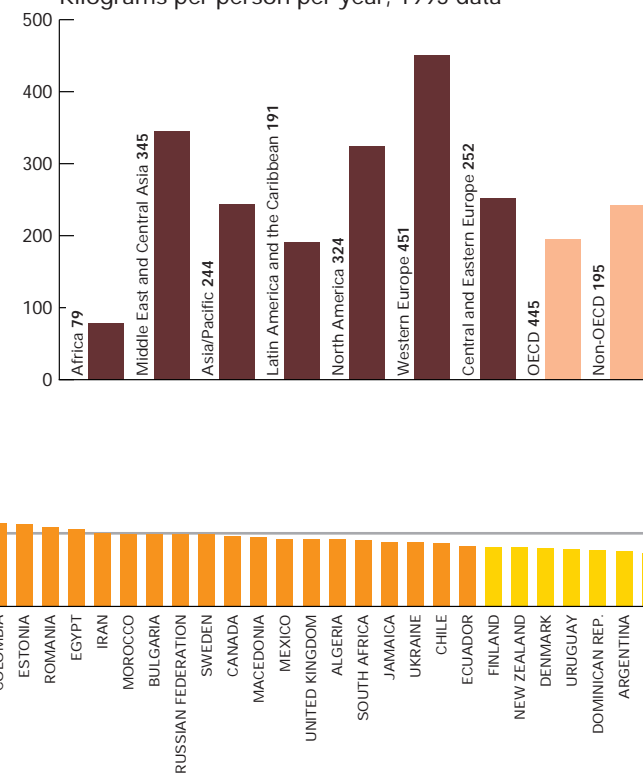
**Fig. 30:  
CONSUMPTION BY COUNTRY**  
Kilograms per person per year,  
1995 data

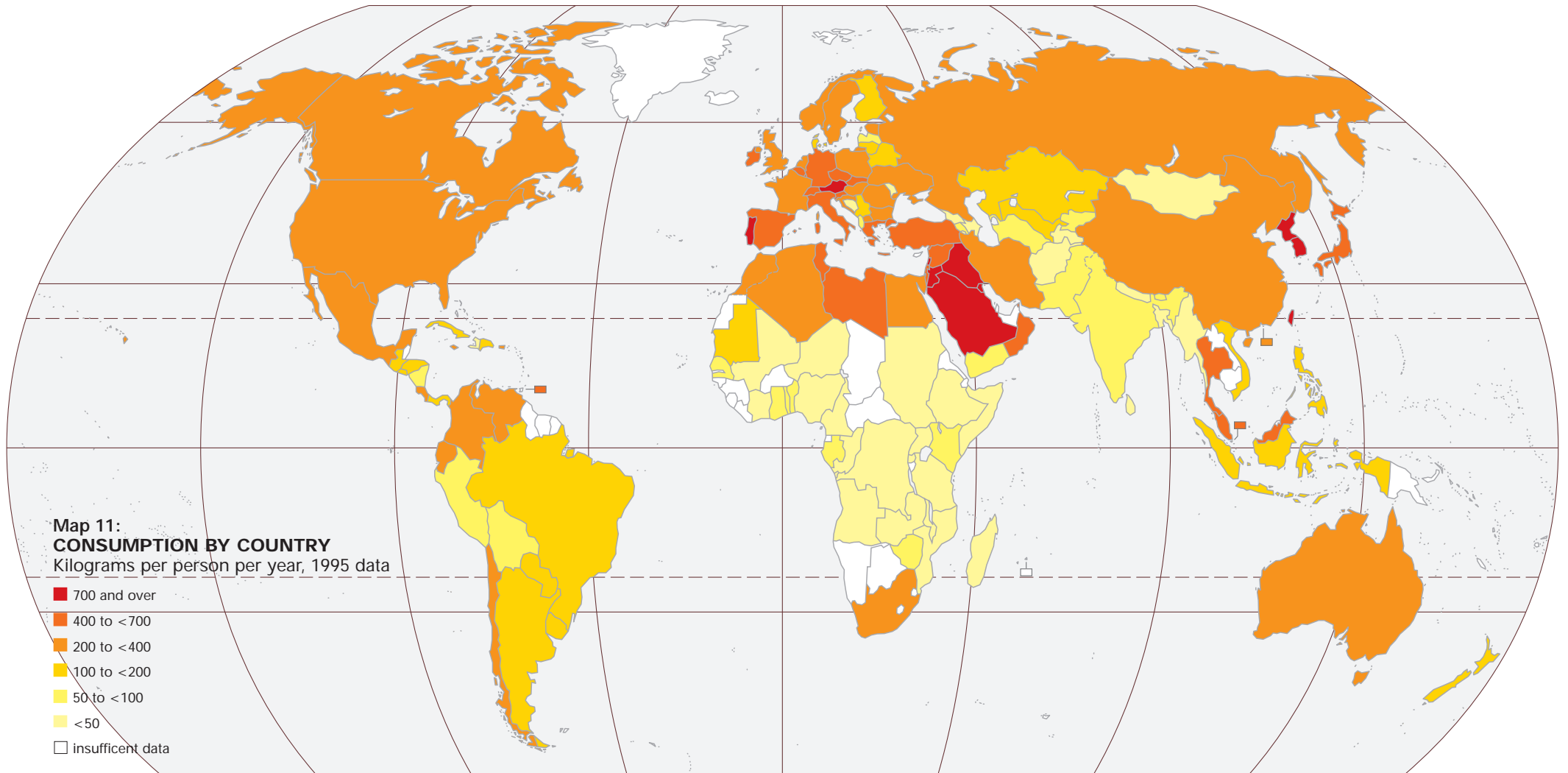


**Fig. 28:  
CONSUMPTION BY MAJOR COUNTRY/REGION**  
Million tonnes per year, 1960–1995

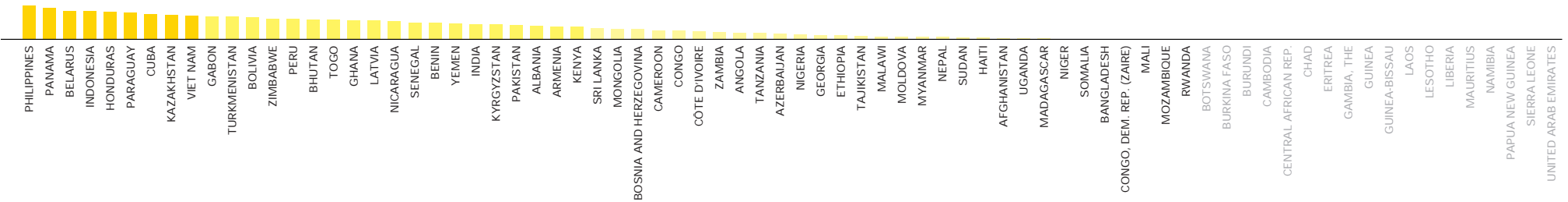


**Fig. 29:  
CONSUMPTION BY REGION**  
Kilograms per person per year, 1995 data





World average



# TECHNICAL NOTES

## Page 2 THE LIVING PLANET INDEX

**Figures 1 and 2.** The LPI is generated by averaging three separate indices for the forest, freshwater, and marine biomes. Each is set at 100 in 1970 and given an equal weighting.

The forest index is based on the change in the area of natural forest cover, corrected for plantations, worldwide from 1960 to 1990 (see below). The loss of forests over the period averaged about 160,000km<sup>2</sup> per year. This relates largely to tropical forests, the loss of temperate forests having been comparatively small.

The freshwater and marine indices are based on the changes in populations of samples of freshwater and marine vertebrate species worldwide since 1970 (see pages 25-26). The samples include all freshwater and marine vertebrate species for which population statistics from more than one point in time could be found, a total of 70 and 87 species respectively.

There are of course limitations to the accuracy of these indices. First, forest area is not directly proportional to forest biodiversity, and there is an underlying decline in forest quality in many regions that is not reflected in the change in area of forest cover, which in many countries is increasing. Some indicators of forest quality have been proposed, but agreement has yet to be reached on what the best measures should be.

Second, it is difficult to ensure the representativeness of the freshwater and marine indices because the number of species in each sample compared with the total numbers of freshwater and marine species is relatively small. In both samples there is some bias towards birds and mammals, while fishes and reptiles are under-represented and amphibians altogether absent, reflecting the level of knowledge of these groups.

A recent estimate by Costanza et al. (1997) put the current economic value of natural ecosystems and ecological services provided by the biosphere at about US\$33 trillion per year, more than the global GNP of US\$28 trillion per year. The LPI estimates the average rate of degradation of the Earth's ecosystems over the period 1990-1995 to be about 3 per

cent per year, which equates to an economic loss of about US\$1 trillion per year. Costanza et al. also estimated the current economic value of ecological services provided by tropical forests to be about US\$2,000 per hectare per year, by freshwater ecosystems to be about US\$5 trillion per year and by marine ecosystems to be about US\$21 trillion per year. The average annual declines from 1990 to 1995 in the forest, freshwater, and marine indices therefore equate to economic losses of about US\$32 billion per year for forests, US\$291 billion per year for freshwater ecosystems, and US\$775 billion per year for marine ecosystems.

**Figure 3 and Map 1.** The number of threatened bird and mammal species refers to the number that are globally vulnerable, endangered or critically endangered (IUCN 1996), and not necessarily the number of bird and mammal species that are threatened within each country: a species may be highly threatened in one country but in a lower risk category globally. Only birds and mammals were used as the assessment of the status of all bird and mammal species has been completed, whereas the assessment of other taxonomic groups is incomplete.

## Page 4 CONSUMPTION PRESSURE

Consumption Pressure is a measure of the impact that humans exert on natural ecosystems through the consumption of natural resources and pollution of the environment. The calculations were made using six measures of resource consumption and pollution in 152 countries: grain and meat consumption; marine fish consumption; wood and paper consumption; freshwater withdrawals; carbon dioxide (CO<sub>2</sub>) emissions, as a proxy for fossil fuel consumption; and cement consumption, as a proxy for land consumption. Countries with populations of less than 1 million in 1995 were not included in the analysis: 64 countries, with a combined population of about 13 million people, were therefore excluded. Luxembourg has been aggregated with Belgium. Regional information is based on data for regional subsets of the 152 countries, while global information

includes all countries of the world. (For details of the regions, see inside back cover.)

All consumption, production, and population data relate to 1995. The sources used to calculate each of the six components are given on pages 26-27. National population statistics are from the United Nations Population Division (*Annual Populations (1994 Rev.)*, Median estimate), and grid-referenced population statistics used to create **Map 2** come from the National Center for Geographic Information and Analysis at the University of California, Santa Barbara (Tobler et al. 1995).

For grain, marine fish, and wood, total national consumption is calculated as follows:

$$\text{Consumption} = \frac{\text{production} + \text{imports} - \text{exports} + (\text{imports of derived products} - \text{corresponding exports})}{\text{population}}$$

The principal products derived from these three resources include meat, fish meal, and pulp and paper. Freshwater withdrawals and CO<sub>2</sub> emissions data are taken directly from national datasets. Cement consumption was assumed to be equal to production in all countries except for the largest 15 consumers, for which national consumption data are available.

Total national consumption was then divided by the country's population to give national per person consumption. Regional consumption per person was calculated as a region's total consumption, divided by its population. Global per person consumption was calculated by dividing the world's total consumption of each component by the world's total population.

The aggregated Consumption Pressure is a measure based on the six components combined. For each component, a country's per person average was divided by the global per person average, giving a relative score. The relative scores for all six components were then averaged to give the Consumption Pressure per person for that country. Total Consumption Pressure was then calculated by multiplying a country's per person Consumption Pressure by its population. For countries where there was insufficient data to calculate one of the components, Consumption Pressure was based

on only five components. For countries where there were insufficient data on more than one component, Consumption Pressure was not calculated.

## Page 6 FOREST ECOSYSTEMS

Statistics on deforestation rates and forest loss in the Brazilian Amazon come from the Brazilian National Space Agency (INPE 1998).

**Figure 7 and Tables 2 and 3.** For Africa, Asia, and Latin America, data for 1990 are World Conservation Monitoring Centre (WCMC) figures for total forest area for each region minus the United Nations Food and Agriculture Organization (FAO) plantation figures. Deforestation rates for 1980-1990 are those in the FAO *Forest Resources Assessment 1990*. For 1960-1970 and 1970-1980, deforestation rates from Singh and Marzoli (1995) have been applied to each region. The latter only applied to the tropical parts of these regions.

For Europe, changes are taken from the *Dobris Assessment* which has figures for change in forest extent for 29 European countries, including those of Eastern Europe, for the decades from 1960-1990. The total forest area summed over these countries is assumed to be representative of Europe as a whole.

Figures for changes in Australasia and North America are from FAO (1995), applied to WCMC figures for forest area. In both cases figures for plantation area have been deducted from the 1990 WCMC figure for total forest area to give an estimate of natural forest. It may be assumed that the plantation areas are underestimates. Data are missing for forest changes in North America before 1980 so it is assumed that no overall change has taken place. It is also assumed that there has been no change in forest area in Russia from 1980-1990: FAO (1995) notes that this is the safest assumption, as data from different sources conflict.

Plantation areas in the tropics and temperate regions in Argentina, Australia, Canada, Chile, China, Japan, Morocco, New Zealand, the Republic of Korea, South Africa, United States, Uruguay, and the former USSR were obtained from FAO.

For Europe, the area of forest stands less than 30 years old was calculated for 21 countries from Kuusela (1994), as a proxy for plantations. This gives a minimum estimate, as many plantations are more than 30 years old. It is assumed that the average proportion of plantation to total forest area for these countries, 31 per cent, was representative of the whole of Europe. The estimated area of plantation in Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, and Ukraine was subtracted from the former USSR total and the remainder attributed to Russia.

**Table 2.** Forest fragmentation was evaluated using geographic information systems (GIS) analyses of large regional sections from the global current forest cover dataset, without dividing forest cover into different types. Neither national boundaries nor rivers less than 0.5km wide were considered to disrupt patches of forest. Europe's forests were the most fragmented with about 26 per cent of the total, including plantations, in blocks of less than 500km<sup>2</sup>. Around 14 per cent of Asia's forests were fragmented into areas smaller than 500km<sup>2</sup>, whereas in Russia and North America the figure was less than 10 per cent.

**Figures 8 and 9 and Map 3.** Original and current forest cover were compiled by WCMC from a variety of national and international source maps. Original forest cover was compiled from six potential vegetation datasets which, between them, cover the globe. The current forest cover data are based on WCMC's holdings of spatial data. These come from a variety of national and international sources, including remote sensing, and a variety of dates. The forest cover in the map is defined as closed forest, which in general refers to canopy cover of more than 30 per cent. The global total matches very well with FAO's estimate of global forest cover in 1990. The classification of forests has been simplified to four forest types: tropical moist forest, tropical dry forest, temperate broadleaf and mixed forest, and needleleaf forest.

The fact that the greatest loss of forest has been in Asia is perhaps unsurprising as most of the world's population is Asian and agriculture

has been practised in Asia for longer than anywhere else. Although it is possible to see a significant reduction in the area of all types of forest, the figures underestimate the true magnitude of impacts on forest biodiversity as much of the current forest cover has regrown or been planted and is therefore generally of lower biological quality.

## Page 8 FRESHWATER ECOSYSTEMS

**Figure 10.** For 227 freshwater species it was possible to locate qualitative information on population trends and estimate with considerable confidence whether numbers were decreasing, stable, or increasing. The species in the sample comprise 19 mammals – desmans, manatees, otters, and river dolphins; 92 birds – cranes, ducks, geese and swans, flamingos, grebes, herons, ibises and spoonbills, rails and gallinules, skimmers and dippers, stilts, and storks; 72 reptiles – crocodilians and turtles; and 44 fishes – grayling, lampreys, paddlefish, and sturgeons.

The total number of species in each category for each time period was used to demonstrate the general status of global freshwater biodiversity at that time. The status for each time period is an indication of any changes in the general status of global freshwater ecosystems from the 1970s through to 1997.

**Figure 2b and Map 4.** Quantitative population data from more than one point in time were available for 70 out of the 227 species. These data points were used to calculate the freshwater ecosystems index, which represents the changes from 1970 to 1995 in a hypothetical population that is typical of the sample. **Map 4** shows the approximate locations of a selection of the species used to construct the index. The 70 species are:

## MAMMALS

### Insectivores

*Desmana moschata*

### River dolphins

*Lipotes vexillifer*

*Platanista minor*

## BIRDS

### Cranes

*Grus americana*

*Grus japonensis*

*Grus monachus*

*Grus vipio*

### Ducks, geese, swans

*Anas acuta*

*Anas americana*

*Anas clypeata*

*Anas crecca*

*Anas discors*

*Anas formosa*

*Anas platyrhynchos*

*Anas querquedula*

*Anas strepera*

*Anas superciliosa*

*Anas wyvilliana*

*Aythya americana*

*Aythya marila*

*Aythya nyroca*

*Aythya valisineria*

*Cygnus olor*

*Marmaronetta angustirostris*

*Mergus albellus*

*Mergus merganser*

*Netta rufina*

*Nettapus auritus*

*Tadorna ferruginea*

### Flamingos

*Phoenicopterus andinus*

*Phoenicopterus chilensis*

*Phoenicopterus jamesi*

*Phoenicopterus minor*

*Phoenicopterus ruber*

### Grebes

*Podiceps taczanowskii*

*Tachybaptus rufolavatus*

### Herons

*Ardea cinerea*

*Ardea cocoi*

*Ardea purpurea*

*Ardeola ralloides*

*Botaurus stellaris*

*Ixobrychus minutus*

*Nycticorax nycticorax*

## Ibises and spoonbills

*Eudocimus ruber*

*Platalea leucorodia*

*Platalea minor*

*Plegadis falcinellus*

## Rails and gallinules

*Fulica cristata*

*Porphyrio porphyrio*

## Stilts

*Himantopus novaezelandiae*

## Storks

*Ciconia ciconia*

*Ciconia nigra*

## REPTILES

### Crocodiles and alligators

*Alligator sinensis*

*Crocodylus acutus*

*Crocodylus mindorensis*

*Crocodylus palustris*

*Crocodylus porosus*

## Gharial

*Gavialis gangeticus*

## Turtles

*Batagur baska*

*Callagur borneoensis*

## FISHES

### Paddlefish

*Polyodon spathula*

## Sturgeons

*Acipenser baerii*

*Acipenser gueldenstaedtii*

*Acipenser naccarii*

*Acipenser sinensis*

*Acipenser stellatus*

*Acipenser transmontanus*

Amur River Fishery-China

Amur River Fishery-Russia

*Huso huso*

**Figure 11.** The base line information is taken from *Project Aqua*, a project designed to document information on more than 600 water bodies judged worthy of conservation (Luther

# TECHNICAL NOTES continued

and Rzóśka 1971). Some of the *Project Aqua* data appear to have been collected in 1970, but the published information relates essentially to the 1960s. A substantial number of lakes treated in *Project Aqua* are also treated in later information sources, such as the *Directory of Asian Wetlands* (Scott 1989) and the *Lakes Database* (ILEC web site), and in these cases it is often possible to make an assessment at a later time point and so determine the extent of change. Entries for 93 lakes were compared and each given a simple score according to whether their condition appears to have declined (or impacts increased), stayed the same, or improved. Three categories of information were used in the scoring: present usage; threats from possible or proposed developments; and other information. No change will sometimes mean no new information. The results are based on uneven sampling and non-standard reporting, but may be taken as a valid indication of the general direction of change over recent decades. However, not all remedial measures taken within the past 10 years or so, or their beneficial effects, will have been reported in the information sources used.

## Page 10 MARINE ECOSYSTEMS

**Figure 12.** It was possible to locate qualitative information on population trends for 116 marine vertebrate species and estimate with considerable confidence whether their numbers were decreasing, stable, or increasing. The total number of species in each category for each time period was used to demonstrate the general status of global marine biodiversity at that time. The status for each time period is an indication of any changes in the general status of global marine ecosystems from the 1970s through to 1997. The species in the sample consist of 36 mammals – marine otters, sirenians, seals, fur seals and sea lions, baleen whales, toothed whales, and dolphins; 40 birds – albatrosses, gannets and boobies, and penguins; 7 reptiles – marine turtles; and 33 fishes – cods, flatfish, herrings, sole, seaperch and redfish, tuna and mackerel, and other marine fish.

**Figure 2c and Map 5.** Quantitative population data from more than one point in time were available for 87 out of the 116 species. These data points were used to calculate the marine ecosystems index. As with the freshwater ecosystems, the marine ecosystems index represents the changes from 1970 to 1995 of a hypothetical population that is typical of the sample as a whole. The approximate locations of a selection of the populations used are shown in **Map 5**. The 87 species are:

### MAMMALS

**Sea otter**  
*Enhydra lutris*

### Fur seals

*Arctocephalus australis*  
*Arctocephalus forsteri*  
*Arctocephalus galapagoensis*  
*Arctocephalus philippii*  
*Arctocephalus pusillus*  
*Arctocephalus townsendi*  
*Arctocephalus tropicalis*  
*Callorhinus ursinus*

### Monk seals

*Monachus monachus*  
*Monachus schauinslandi*

### Sea lions

*Eumetopias jubatus*  
*Neophoca cinerea*  
*Otaria byronia*  
*Phocartos hookeri*  
*Zalophus californianus*

### Baleen whales

*Eschrichtius robustus*  
*Balaena mysticetus*  
*Balaenoptera borealis*  
*Balaenoptera edeni*  
*Balaenoptera musculus*  
*Balaenoptera physalus*  
*Megaptera novaeangliae*

### Toothed whales

*Delphinapterus leucas*

### Manatee

*Trichechus manatus*

### BIRDS

#### Albatrosses

*Diomedea albatrus*  
*Diomedea amsterdamensis*  
*Diomedea cauta*  
*Diomedea chlororhynchos*  
*Diomedea exulans*  
*Diomedea immutabilis*  
*Diomedea irrorata*  
*Diomedea melanophris*

#### Gannets and boobies

*Morus bassanus*  
*Morus capensis*  
*Papasula abbotti*  
*Sula dactylatra*  
*Sula sula*  
*Sula variegata*

#### Penguins

*Aptenodytes forsteri*  
*Aptenodytes patagonicus*  
*Eudyptes pachyrhynchus*  
*Eudyptes robustus*  
*Megadyptes antipodes*  
*Pygoscelis adeliae*  
*Pygoscelis papua*  
*Spheniscus demersus*  
*Spheniscus humboldti*  
*Spheniscus mendiculus*

### REPTILES

#### Turtles

*Caretta caretta*  
*Chelonia mydas*  
*Dermochelys coriacea*  
*Lepidochelys kempii*  
*Lepidochelys olivacea*

### FISHES

#### Cods

*Gadus macrocephalus*  
*Gadus morhua*  
*Melanogrammus aeglefinus*  
*Merlangius merlangus*  
*Merluccius productus*  
*Pollachius virens*  
*Theragra chalcogramma*  
*Trisopterus esmarkii*

### Flatfish

*Atheresthes stomias*  
*Hippoglossoides ellassodon*  
*Hippoglossoides platessoides*  
*Lepidopsetta bilineata*  
*Limanda aspera*  
*Pleuronectes ferrugineus*  
*Pleuronectes platessa*  
*Pleuronectes quadrituberculatus*  
*Pseudopleuronectes americanus*  
*Reinhardtius hippoglossoides*  
*Solea solea*

### Herrings

*Clupea harengus*  
*Clupea pallasii*  
*Sprattus sprattus*

### Seaperch and redfish

*Sebastes alutus*  
*Sebastes mentella*  
*Sebastolobus alascanus*

### Tunas and mackerel

*Thunnus albacares*  
*Thunnus obesus*  
*Thunnus thynnus*  
*Scomber scombrus*

### Other marine fish

*Anoplopoma fimbria*  
*Mallotus villosus*  
*Pleurogrammus monopterygius*  
*Urophycis tenuis*

## Page 12 GRAIN CONSUMPTION

**Figures 13 to 15 and Map 6.** All data came from the FAOSTAT database of national grain and meat production and trade. Grain-equivalent consumption was calculated as the consumption of grain, plus its indirect consumption in the form of meat, plus seed, processed, and waste grain. In calculating a country's consumption, all imports and exports of grain, meat, and poultry were taken into account.

Apart from the inherent inefficiency of converting vegetable matter into meat, animals are also more demanding of water and energy than crops (see table). The following conversion



factors were used to convert from meat into grain consumption (kg of grain per kg of meat): beef and veal 5.0; pig meat 3.5; mutton and goat 1.8; poultry 2.25.

#### Food, energy, and water requirements of crops and livestock

Food	grain requirement: kg grain input per kg meat output (FAO)	energy requirement: Joule input per Joule output (Lünzer 1992)	water requirement: litres per kg meat (Pimentel 1997)
wheat	0	0.1-0.4	900
maize	0		1 400
rice	0	0.1-0.4	1 910
milk		0.8-8	
eggs		0.5-10	
poultry (battery-farmed)	2.0-2.5	7	3 500
pork	3.0-4.0		
beef (industrial production)	3.0-7.0	35	100 000

#### Page 14 MARINE FISH CONSUMPTION

**Figure 16.** Annual data on fish production 1961-1983 come from FAOSTAT and include all marine fish, crustaceans, molluscs and cephalopods, capture and culture fisheries; 1984-1995 data come from FAO *Recent trends in global fishery production* ([www.fao.org](http://www.fao.org)) which includes all of the above except those produced by mariculture.

**Figures 17 and 18 and Map 7.** The statistics on fish consumption came from the FAOSTAT database on nutrition and FAO Fisheries Department (FAO 1997, Grainger and Garcia 1996). Consumption includes marine fish, crustaceans, cephalopods and other molluscs, and non-food fish meal and fish oil. All imports and exports of both food fish and non-food fish were taken into account. Freshwater fish were not included, nor was by-catch as this is difficult to attribute to a consumer country. Farmed (mariculture) fish are included in this dataset. The difference in total world fish consumption and total world fish production in 1995 is explained by the

inclusion of farmed fish in the consumption data and also the inclusion of data from Taiwan, which are not included in the production data.

#### Page 16 WOOD CONSUMPTION

**Figure 19.** Figures on wood production came from the FAOSTAT forestry database. The data include fuelwood and industrial roundwood.

The world's forests, managed sustainably, could still provide enough wood to meet current needs. On the basis of the world's current forest cover and the potential sustainable yields of eight different forest types, allowing for 10 per cent protected areas in each, total annual yield could be as high as 4 billion cubic metres (m<sup>3</sup>), or 0.7m<sup>3</sup> per person per year. The eight forest types are based on the four types used to classify forest ecosystems, incorporating differences between tropical forest productivity in the Americas and the rest of the world, plus plantations.

**Figures 20 and 21 and Map 8.** Calculations were made from the FAOSTAT database of national production, imports, and exports of wood and wood products. Wood used for fuel or timber is measured in m<sup>3</sup>. Pulp and paper consumption, which is measured in tonnes, has been converted back into m<sup>3</sup> of wood raw material equivalent (wrme). Conversion factors vary for each product from paper mill to paper mill and from country to country but, for reasons of practicality, a general set of factors was used to convert different types of pulp and paper into wrme (in m<sup>3</sup> wrme per tonne): mechanical pulp 2.5; chemical pulp 5.0; semi- chemical pulp 2.75; dissolving pulp 2.5; newsprint 2.8; writing and printing paper 3.5; other paper and paperboard 2.5. Sawnwood, wood-based panels, and fibreboard were not converted as the wood waste generated in their production is usually used elsewhere in the industry for fibre, pulp, or energy.

National consumption of wrme is estimated as the volume of production of wood raw material, plus the volume of net trade in all wood raw material and products.

#### Page 18 FRESHWATER WITHDRAWALS

According to Postel et al. (1996), humanity now uses 54 per cent of freshwater runoff that is geographically and temporally accessible.

**Figures 22 to 24 and Map 9.** Annual withdrawals of freshwater per person by country and region came from unpublished data on freshwater resources and availability from a study led by the Russian State Hydrological Institute (Shiklomanov et al.), undertaken for the United Nations (WMO et al. 1997). Some studies prefer to measure each country's withdrawals of freshwater as a fraction of its annual renewable resource. However, this masks the fact that in many countries freshwater may not be accessible throughout the country or available throughout the year. The Sahel region, for example, faces severe water shortages although it uses less than 10 per cent of its annual renewable freshwater resource.

#### Page 20 CARBON DIOXIDE EMISSIONS

**Figures 25 to 27 and Map 10.** The data include emissions from the combustion of fossil fuels (coal, oil, and natural gas), gas flaring, cement manufacture, and bunker fuels, from Marland and Boden (1998). Gas flaring is the burning of unwanted natural gas at oil well-heads. The manufacture of cement releases CO<sub>2</sub> from the breakdown of calcium carbonate. Bunker fuels are used in international marine and aviation transport. Conventional emissions inventories omit bunker fuels from national accounts because of the problem of attributing them to any one country. However, as bunker fuels are responsible for 2-3 per cent of global emissions, and perhaps as much as 10 per cent of global warming, they have been included and attributed to the country in which the fuel is loaded on to the aircraft or ship. Singapore has high per person emissions in part because it is an international transport hub.

#### Page 22 CEMENT CONSUMPTION

**Figures 28 to 30 and Map 11.** National data on cement production were used where data on consumption are not available. Production is an

adequate substitute for consumption as most cement is consumed within the producing country and ground deliveries of cement generally do not exceed 150km. Marland and Boden (1998) give figures on CO<sub>2</sub> emissions from cement manufacture, which have been converted into cement production at a rate of 2 tonnes of cement per tonne of CO<sub>2</sub>. Data on consumption are available for the top 15 consuming countries from the Centre for Concrete Information (1997).

*All data used in the Living Planet Report 1998 was compiled before 1 June 1998.*

# NATIONAL AND REGIONAL CONSUMPTION units per person per year, 1995

	POPULATION (millions)	Total (kg grain- equivalent)	GRAIN Meat (kg grain- equivalent)	Food grain (kg)	Seed, waste, and processing (kg)	FISH Marine (kg)	Total (m³ wrme)	WOOD Fuelwood and charcoal (m³)	Timber, pulp, and paper (m³ wrme)	FRESHWATER Withdrawals (m³)	CO <sub>2</sub> Emissions (t)	CEMENT (kg)	CONSUMPTION PRESSURE (average consumer equivalents)
World average	N.A	316	125	152	40	15.9	0.58	0.32	0.26	644	4.01	242	1.00
AFRICA													
Algeria	27.94	316	52	236	28	3.6	0.14	0.08	0.06	180	3.32	222	0.58
Angola	11.07	111	42	63	6	10.2	0.63	0.54	0.09	57	0.65	27	0.41
Benin	5.41	182	41	102	39	6.1	1.09	1.03	0.06	28	0.13	70	0.54
Botswana	1.49	251	94	133	24	6.5	1.07	1.00	0.07	81	1.51	I.D	0.71
Burkina Faso	10.32	247	3	208	37	0.6	0.97	0.93	0.04	40	0.09	I.D	0.52
Burundi	6.39	64	14	34	16	0.1	0.78	0.76	0.02	20	0.04	I.D	0.32
Cameroon	13.23	171	44	109	17	6.9	1.17	0.93	0.23	38	0.32	39	0.55
Central African Rep.	3.32	140	85	48	8	0.2	1.16	0.98	0.18	26	0.08	I.D	0.50
Chad	6.36	187	37	127	23	I.D	0.72	0.61	0.11	34	0.02	I.D	I.D
Congo	2.59	118	54	59	5	23.0	1.45	0.91	0.54	20	0.50	39	0.77
Congo, Dem. Rep. (Zaire)	43.90	54	13	36	6	1.8	1.07	1.00	0.08	10	0.06	2	0.36
Côte d'Ivoire	14.25	176	30	121	25	11.1	0.99	0.81	0.18	66	0.75	35	0.57
Egypt	62.93	352	60	251	41	4.3	0.11	0.04	0.07	881	1.54	255	0.73
Eritrea	3.53	I.D	21	I.D	I.D	I.D	I.D	I.D	I.D	57	I.D	I.D	I.D
Ethiopia	55.05	I.D	27	I.D	I.D	0.0	0.86	0.83	0.03	36	0.07	17	0.33
Gabon	1.32	212	116	80	16	33.0	I.D	I.D	I.D	59	3.00	99	0.80
Gambia, The	1.12	169	20	132	17	14.6	1.09	0.99	0.10	32	0.19	I.D	0.69
Ghana	17.45	133	22	88	24	18.8	1.50	1.44	0.06	17	0.24	80	0.77
Guinea	6.70	151	16	110	24	6.4	0.72	0.62	0.10	140	0.17	I.D	0.48
Guinea-Bissau	1.07	234	55	161	18	5.2	0.54	0.39	0.15	21	0.23	I.D	0.42
Kenya	28.26	185	52	124	10	0.2	1.48	1.41	0.07	87	0.24	53	0.59
Lesotho	2.05	240	53	172	15	3.9	I.D	I.D	I.D	30	I.D	I.D	I.D
Liberia	3.04	I.D	13	I.D	I.D	2.0	2.06	1.74	0.33	55	0.12	I.D	I.D
Libya	5.41	289	67	193	29	5.6	0.17	0.10	0.07	879	7.43	426	1.09
Madagascar	14.76	204	68	114	22	5.7	0.74	0.71	0.03	1 567	0.08	4	0.79
Malawi	11.13	201	13	160	28	0.2	0.94	0.89	0.05	87	0.07	13	0.41
Mali	10.80	277	56	194	27	0.4	0.61	0.57	0.04	162	0.05	2	0.37
Mauritania	2.27	220	50	160	9	13.6	0.01	0.00	0.00	814	1.38	165	0.64
Mauritius	1.12	276	107	158	11	32.4	0.16	0.01	0.15	322	2.11	I.D	0.84
Morocco	27.03	358	50	262	46	16.6	0.13	0.05	0.08	427	1.09	241	0.72
Mozambique	16.00	109	20	83	7	1.9	1.15	1.08	0.07	41	0.08	1	0.42
Namibia	1.54	I.D	65	124	I.D	I.D	I.D	I.D	I.D	181	I.D	I.D	I.D
Niger	9.15	307	34	220	53	0.1	0.64	0.60	0.04	69	0.13	3	0.37
Nigeria	111.72	196	27	125	43	5.8	1.00	0.92	0.08	42	0.83	23	0.51
Rwanda	7.95	I.D	8	I.D	I.D	0.2	0.71	0.68	0.04	102	0.07	1	0.29
Senegal	8.31	242	55	163	24	32.3	0.63	0.54	0.09	205	0.46	71	0.77
Sierra Leone	4.51	144	15	115	14	10.0	0.74	0.71	0.03	99	0.17	I.D	0.51



Units per person per year	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	CONSUMPTION PRESSURE
	(millions)	Total (kg grain-equivalent)	Meat (kg grain-equivalent)	Food grain (kg)	Seed, waste, and processing (kg)	Marine (kg)	Total (m <sup>3</sup> wrme)	Fuelwood and charcoal (m <sup>3</sup> )	Timber, pulp, and paper (m <sup>3</sup> wrme)	Withdrawals (m <sup>3</sup> )	Emissions (t)	(kg)	(average consumer equivalents)
<b>AFRICA cont.</b>													
Somalia	9.25	I.D	32	I.D	I.D	1.2	0.95	0.94	0.01	99	I.D	3	I.D
South Africa	41.47	333	124	187	23	28.6	0.56	0.17	0.39	359	7.56	219	1.19
Sudan	28.10	233	56	158	18	0.2	0.91	0.82	0.09	633	0.13	9	0.56
Tanzania	29.69	185	40	111	33	1.4	1.24	1.17	0.07	40	0.09	27	0.50
Togo	4.14	144	28	91	25	8.6	0.58	0.52	0.06	28	0.18	85	0.41
Tunisia	8.90	296	56	202	38	7.9	0.49	0.38	0.12	381	1.79	484	0.89
Uganda	21.30	123	35	59	29	I.D	0.81	0.70	0.11	9	0.05	6	0.37
Zambia	9.46	216	29	159	27	0.9	1.54	1.42	0.12	186	0.27	32	0.65
Zimbabwe	11.26	188	24	146	17	0.3	0.72	0.56	0.16	136	0.87	89	0.44
Regional average	N.A	194	42	130	25	6.0	0.80	0.71	0.09	229	1.06	79	0.55
<b>MIDDLE EAST AND CENTRAL ASIA</b>													
Afghanistan	20.14	I.D	31	I.D	I.D	I.D	0.38	0.30	0.08	1 773	0.06	6	I.D
Armenia	3.60	301	56	147	99	I.D	I.D	I.D	I.D	1 142	1.01	56	I.D
Azerbaijan	7.56	343	40	181	122	I.D	I.D	I.D	I.D	2 257	5.64	26	I.D
Georgia	5.46	388	87	180	121	6.2	I.D	I.D	I.D	743	1.42	18	0.64
Iran	67.28	293	58	211	24	10.7	0.13	0.04	0.09	1 272	3.95	243	0.96
Iraq	20.45	177	21	132	23	0.2	0.01	0.01	0.00	2 556	4.84	881	1.57
Israel	5.63	337	173	145	19	52.5	0.40	0.00	0.39	405	8.56	623	1.73
Jordan	5.44	230	64	151	15	3.2	0.09	0.00	0.09	167	2.59	736	0.84
Kazakhstan	17.11	555	188	220	148	I.D	0.00	0.00	0.00	2 580	12.95	105	1.89
Kuwait	1.55	334	191	128	16	11.5	0.20	0.04	0.16	305	32.63	1 295	2.68
Kyrgyzstan	4.75	349	130	131	88	I.D	I.D	I.D	I.D	2 730	1.15	63	I.D
Lebanon	3.01	271	124	137	10	0.7	0.29	0.17	0.12	391	4.61	998	1.21
Oman	2.16	I.D	87	I.D	I.D	33.1	0.10	0.00	0.10	242	5.69	648	1.35
Saudi Arabia	17.88	301	111	168	22	10.9	0.19	0.01	0.18	285	16.30	896	1.70
Syria	14.66	337	38	232	68	0.8	0.03	0.00	0.03	744	3.16	410	0.80
Tajikistan	6.10	349	34	188	127	I.D	I.D	I.D	I.D	2 450	0.61	16	I.D
Turkey	61.95	408	56	233	120	11.2	0.35	0.14	0.21	585	2.70	460	1.01
Turkmenistan	4.10	414	101	187	126	I.D	I.D	I.D	I.D	6 388	6.92	98	I.D
United Arab Emirates	2.38	402	249	125	27	49.7	0.43	0.01	0.41	345	29.67	I.D	2.61
Uzbekistan	22.84	413	99	188	126	I.D	0.00	0.00	0.00	4 021	4.33	153	1.85
Yemen	14.50	205	34	164	6	6.0	0.03	0.02	0.01	234	1.03	69	0.33
Regional average	N.A	316	71	182	66	7.4	0.15	0.06	0.09	1 461	4.89	345	1.11
<b>ASIA/PACIFIC</b>													
Australia	18.09	554	369	105	80	39.3	1.55	0.16	1.39	1 510	16.50	332	2.46
Bangladesh	120.43	194	10	170	14	1.7	0.27	0.26	0.01	220	0.17	2	0.26
Bhutan	1.64	I.D	21	I.D	I.D	I.D	0.90	0.87	0.03	14	0.15	85	I.D
Cambodia	10.25	247	42	177	28	1.7	0.74	0.65	0.08	64	0.05	I.D	0.45
China	1 221.46	357	145	182	30	12.5	0.26	0.17	0.09	413	2.62	352	0.85
Hong Kong	5.87	545	418	118	9	58.2	1.00	0.05	0.95	158	7.97	327	1.78
India	935.74	197	17	161	19	2.3	0.32	0.29	0.03	649	0.97	65	0.47
Indonesia	197.59	238	31	189	18	14.6	0.90	0.76	0.14	420	1.51	122	0.79

Units per person per year	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	CONSUMPTION PRESSURE
	(millions)	Total (kg grain-equivalent)	Meat (kg grain-equivalent)	Food grain (kg)	Seed, waste, and processing (kg)	Marine (kg)	Total (m <sup>3</sup> wrme)	Fuelwood and charcoal (m <sup>3</sup> )	Timber, pulp, and paper (m <sup>3</sup> wrme)	Withdrawals (m <sup>3</sup> )	Emissions (t)	(kg)	(average consumer equivalents)
<b>ASIA/PACIFIC cont.</b>													
Japan	125.10	309	153	129	28	99.0	0.47	0.01	0.46	735	9.31	636	2.35
Korea, D.P.R.	23.92	224	35	159	31	68.7	0.22	0.18	0.04	686	10.75	712	2.02
Korea, Rep.	45.00	374	142	168	65	61.2	0.40	0.11	0.29	657	8.69	1 256	2.35
Laos	4.88	255	39	181	35	0.1	1.10	0.92	0.18	258	0.06	I.D	0.63
Malaysia	20.14	282	144	126	11	39.8	2.01	0.48	1.53	648	5.34	530	1.90
Mongolia	2.41	390	239	118	33	0.9	0.21	0.16	0.05	273	3.51	45	0.52
Myanmar	46.53	271	26	221	24	13.1	0.50	0.44	0.06	101	0.15	11	0.46
Nepal	21.92	263	34	199	30	I.D	0.95	0.92	0.03	150	0.07	10	0.55
New Zealand	3.58	621	480	97	44	16.7	I.D	I.D	I.D	557	8.43	196	1.36
Pakistan	140.50	206	44	149	13	2.7	0.22	0.20	0.02	1 985	0.61	61	0.78
Papua New Guinea	4.30	149	70	76	3	25.4	2.04	1.29	0.76	28	0.59	I.D	1.16
Philippines	67.58	231	85	137	9	34.6	0.61	0.54	0.07	726	0.93	145	0.99
Singapore	2.85	I.D	256	I.D	I.D	46.7	0.75	0.02	0.73	67	34.84	668	3.16
Sri Lanka	18.35	180	16	153	11	15.1	0.51	0.49	0.02	567	0.39	49	0.60
Taiwan	21.30	353	235	101	17	124.3	0.48	0.00	0.48	I.D	8.53	1 258	3.42
Thailand	58.79	212	61	121	30	50.0	0.73	0.62	0.11	596	2.98	572	1.52
Viet Nam	74.55	272	65	181	26	9.8	0.47	0.41	0.06	414	0.43	101	0.58
Regional average	N.A	277	85	168	24	15.5	0.38	0.28	0.11	569	2.31	244	0.83
<b>LATIN AMERICA AND THE CARIBBEAN</b>													
Argentina	34.59	526	346	130	51	9.0	0.37	0.15	0.22	1 035	3.77	185	1.03
Bolivia	7.41	306	157	124	24	0.9	0.34	0.17	0.17	210	1.41	95	0.45
Brazil	161.79	366	220	104	42	5.0	1.29	0.84	0.45	290	1.58	173	0.88
Chile	14.26	351	201	136	14	185.5	1.54	0.70	0.84	1 627	3.09	211	3.27
Colombia	35.10	248	138	101	10	11.8	0.61	0.51	0.11	172	1.93	275	0.74
Costa Rica	3.42	283	157	114	12	4.6	1.57	0.98	0.59	394	1.53	289	1.02
Cuba	11.04	184	73	100	11	11.0	0.29	0.23	0.06	868	2.65	109	0.71
Dominican Rep.	7.82	228	127	89	11	11.8	0.20	0.13	0.07	445	1.51	186	0.61
Ecuador	11.46	218	114	92	12	12.8	0.97	0.45	0.52	583	2.05	201	0.90
El Salvador	5.77	236	62	161	14	1.5	1.23	1.15	0.07	173	0.90	152	0.68
Guatemala	10.62	217	53	150	14	1.2	1.36	1.25	0.10	141	0.68	147	0.68
Haiti	7.18	I.D	33	I.D	I.D	2.6	0.90	0.86	0.04	7	0.09	7	0.36
Honduras	5.65	193	50	127	16	2.6	1.16	1.04	0.12	293	0.68	116	0.65
Jamaica	2.45	224	114	97	12	20.7	0.42	0.22	0.20	169	3.74	214	0.80
Mexico	93.67	373	153	177	43	14.4	0.29	0.17	0.12	899	3.84	224	0.98
Nicaragua	4.43	188	43	130	15	1.5	0.85	0.83	0.03	381	0.61	79	0.54
Panama	2.63	319	180	123	16	34.3	0.48	0.36	0.12	751	2.62	133	1.06
Paraguay	4.96	430	315	76	39	0.6	2.03	1.31	0.72	109	0.77	115	0.96
Peru	23.78	197	81	105	10	38.7	0.55	0.45	0.10	787	1.29	88	0.99
Puerto Rico	3.67	I.D	70	I.D	I.D	0.5	I.D	I.D	I.D	I.D	4.38	385	I.D
Trinidad and Tobago	1.31	212	80	115	17	9.2	0.19	0.02	0.18	115	13.71	460	1.18
Uruguay	3.19	570	406	110	54	9.9	1.33	0.96	0.38	1 358	1.81	189	1.35
Venezuela	21.84	337	178	126	33	19.6	0.17	0.04	0.13	188	8.46	316	1.05
Regional average	N.A	332	180	121	32	15.7	0.81	0.54	0.27	533	2.58	191	0.95

Units per person per year	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	CONSUMPTION PRESSURE
	(millions)	Total (kg grain-equivalent)	Meat (kg grain-equivalent)	Food grain (kg)	Seed, waste, and processing (kg)	Marine (kg)	Total (m <sup>3</sup> wrme)	Fuelwood and charcoal (m <sup>3</sup> )	Timber, pulp, and paper (m <sup>3</sup> wrme)	Withdrawals (m <sup>3</sup> )	Emissions (t)	(kg)	(average consumer equivalents)
<b>NORTH AMERICA</b>													
Canada	29.46	560	349	95	116	31.7	1.81	0.18	1.63	1 604	14.95	234	2.35
United States	263.25	692	431	115	147	23.1	2.08	0.36	1.72	1 870	19.83	334	2.74
Regional average	N.A	679	423	113	144	23.9	2.05	0.34	1.71	1 843	19.34	324	2.70
<b>WESTERN EUROPE</b>													
Austria	7.97	545	387	95	63	26.1	0.73	0.42	0.31	304	7.52	753	1.68
Belgium/Luxembourg	10.52	467	317	100	49	46.8	0.81	0.06	0.74	858	12.26	593	2.11
Denmark	5.18	593	372	104	117	134.5	1.35	0.11	1.25	234	11.96	193	2.80
Finland	5.11	418	238	82	98	65.1	1.77	0.81	0.96	439	10.38	196	2.09
France	57.98	489	333	113	43	35.8	0.98	0.17	0.81	665	6.21	345	1.58
Germany	81.59	443	294	88	61	14.7	0.78	0.05	0.73	580	10.53	466	1.52
Greece	10.45	476	275	148	53	37.9	0.35	0.13	0.23	665	8.63	670	1.74
Ireland	3.55	507	278	132	98	39.9	0.98	0.02	0.96	225	9.50	563	1.81
Italy	57.19	480	296	159	25	30.4	0.60	0.10	0.50	986	7.44	568	1.70
Netherlands	15.50	443	317	69	56	107.6	0.58	0.02	0.56	519	11.59	323	2.37
Norway	4.34	362	212	116	34	251.0	0.78	0.20	0.58	46	17.26	323	4.00
Portugal	9.82	423	260	127	36	66.4	0.36	0.06	0.30	739	5.60	814	2.01
Spain	39.62	465	320	103	42	59.0	0.52	0.07	0.45	782	6.26	644	1.92
Sweden	8.78	393	235	99	59	42.8	2.34	0.44	1.90	341	5.62	240	1.82
Switzerland	7.20	393	266	101	27	31.1	1.01	0.12	0.90	160	5.92	556	1.50
United Kingdom	58.26	389	240	94	55	39.6	0.68	0.01	0.67	205	9.71	223	1.43
Regional average	N.A	452	294	109	49	41.6	0.77	0.10	0.67	594	8.58	451	1.72
<b>CENTRAL AND EASTERN EUROPE</b>													
Albania	3.44	307	108	119	80	0.9	0.13	0.10	0.03	103	0.54	58	0.30
Belarus	10.14	585	250	200	135	I.D	0.97	0.08	0.89	294	5.85	122	1.19
Bosnia and Herzegovina	3.46	I.D	70	I.D	I.D	0.9	I.D	I.D	0.01	432	0.53	43	I.D
Bulgaria	8.77	492	189	163	140	2.4	0.32	0.10	0.22	1 548	6.57	240	1.21
Croatia	4.50	262	119	95	47	6.8	0.55	0.20	0.35	432	3.81	379	0.90
Czech Rep.	10.30	523	318	120	85	11.0	1.05	0.07	0.98	266	10.89	469	1.54
Estonia	1.53	372	182	114	76	39.8	2.23	0.36	1.87	2 105	10.94	273	2.44
Hungary	10.12	493	264	120	110	17.5	0.55	0.18	0.36	660	5.53	297	1.21
Latvia	2.56	I.D	192	I.D	I.D	36.4	2.22	0.35	1.87	263	3.65	80	1.55
Lithuania	3.70	619	214	242	163	32.2	1.29	0.27	1.02	1 194	4.01	176	1.63
Macedonia	2.16	328	128	137	63	10.7	0.39	0.30	0.09	432	4.97	231	0.87
Moldova	4.43	397	95	181	121	I.D	0.04	0.00	0.04	854	2.44	11	0.66
Poland	38.39	499	244	155	100	10.6	0.49	0.07	0.42	322	8.87	362	1.22
Romania	22.84	593	198	202	193	4.4	0.52	0.12	0.40	1 102	5.31	263	1.20
Russian Federation	147.00	471	204	159	107	20.2	0.65	0.20	0.46	792	12.38	240	1.53
Slovakia	5.35	445	213	121	111	I.D	0.82	0.08	0.74	337	7.11	468	1.41
Slovenia	1.95	567	349	143	75	17.1	0.87	0.09	0.78	432	6.02	515	1.45
Ukraine	51.38	440	168	162	109	8.7	0.00	0.00	0.00	674	8.54	214	1.00
Yugoslavia	10.85	604	342	146	116	14.0	0.12	0.00	0.11	432	3.05	157	0.84
Regional average	N.A	474	209	157	111	13.9	0.53	0.13	0.40	696	9.25	252	1.29

# NATIONAL AND REGIONAL CONSUMPTION units per year, 1995

	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	TOTAL CONSUMPTION PRESSURE
	(millions)	Total (million t grain-equivalent)	Meat (million t grain-equivalent)	Food grain (million t)	Seed, waste, and processing (million t)	Marine (million t)	Total (million m <sup>3</sup> wrme)	Fuelwood and charcoal (million m <sup>3</sup> )	Timber, pulp, and paper (million m <sup>3</sup> wrme)	Withdrawals (billion m <sup>3</sup> )	Emissions (million t)	(million t)	(million average consumer equivalents)
<b>World total</b>	<b>5 737.73</b>	1 815.73	716.10	874.03	230.64	91.22	3 317.10	1 852.01	1 465.14	3 694.21	23 015.83	1 386.38	<b>5 737.73</b>
<b>AFRICA</b>													
Algeria	27.94	8.83	1.46	6.58	0.79	0.10	3.89	2.13	1.77	5.02	92.74	6.21	16.27
Angola	11.07	1.23	0.47	0.69	0.07	0.11	7.02	6.01	1.01	0.63	7.17	0.30	4.53
Benin	5.41	0.98	0.22	0.55	0.21	0.03	5.90	5.58	0.32	0.15	0.69	0.38	2.90
Botswana	1.49	0.37	0.14	0.20	0.04	0.01	1.58	1.49	0.10	0.12	2.24	I.D	1.05
Burkina Faso	10.32	2.55	0.03	2.14	0.38	0.01	10.04	9.58	0.46	0.41	0.96	I.D	5.34
Burundi	6.39	0.41	0.09	0.22	0.10	0.00	4.97	4.86	0.11	0.13	0.23	I.D	2.04
Cameroon	13.23	2.26	0.59	1.44	0.23	0.09	15.46	12.37	3.08	0.50	4.19	0.52	7.27
Central African Rep.	3.32	0.47	0.28	0.16	0.03	0.00	3.83	3.25	0.58	0.09	0.28	I.D	1.67
Chad	6.36	1.19	0.23	0.81	0.15	I.D	4.55	3.88	0.67	0.22	0.15	I.D	I.D
Congo	2.59	0.30	0.14	0.15	0.01	0.06	3.75	2.35	1.40	0.05	1.30	0.10	2.00
Congo, Dem. Rep. (Zaire)	43.90	2.39	0.57	1.56	0.25	0.08	47.18	43.85	3.33	0.42	2.58	0.10	15.98
Côte d'Ivoire	14.25	2.51	0.42	1.73	0.36	0.16	14.14	11.54	2.60	0.94	10.63	0.50	8.09
Egypt	62.93	22.18	3.78	15.81	2.58	0.27	6.81	2.63	4.18	55.43	96.86	16.02	45.88
Eritrea	3.53	I.D	0.07	I.D	I.D	I.D	I.D	I.D	I.D	0.20	I.D	I.D	I.D
Ethiopia	55.05	I.D	1.46	I.D	I.D	0.00	47.35	45.61	1.74	2.00	3.73	0.96	17.99
Gabon	1.32	0.28	0.15	0.11	0.02	0.04	I.D	I.D	I.D	0.08	3.96	0.13	1.05
Gambia, The	1.12	0.19	0.02	0.15	0.02	0.02	1.22	1.11	0.12	0.04	0.22	I.D	0.77
Ghana	17.45	2.32	0.38	1.53	0.41	0.33	26.18	25.19	0.99	0.30	4.21	1.40	13.43
Guinea	6.70	1.01	0.11	0.74	0.16	0.04	4.80	4.15	0.65	0.94	1.12	I.D	3.19
Guinea-Bissau	1.07	0.25	0.06	0.17	0.02	0.01	0.58	0.42	0.16	0.02	0.25	I.D	0.45
Kenya	28.26	5.24	1.47	3.49	0.27	0.01	41.76	39.77	1.99	2.45	6.86	1.50	16.81
Lesotho	2.05	0.49	0.11	0.35	0.03	0.01	I.D	I.D	I.D	0.06	I.D	I.D	I.D
Liberia	3.04	I.D	0.04	I.D	I.D	0.01	6.27	5.28	0.99	0.17	0.37	I.D	I.D
Libya	5.41	1.56	0.36	1.04	0.15	0.03	0.89	0.54	0.36	4.75	40.18	2.30	5.88
Madagascar	14.76	3.01	1.01	1.68	0.33	0.08	10.90	10.46	0.44	23.14	1.18	0.06	11.69
Malawi	11.13	2.24	0.14	1.79	0.31	0.00	10.49	9.94	0.55	0.97	0.76	0.14	4.61
Mali	10.80	2.99	0.60	2.09	0.30	0.00	6.54	6.12	0.42	1.75	0.52	0.02	3.99
Mauritania	2.27	0.50	0.11	0.36	0.02	0.03	0.02	0.01	0.01	1.85	3.14	0.38	1.46
Mauritius	1.12	0.31	0.12	0.18	0.01	0.04	0.18	0.01	0.17	0.36	2.35	I.D	0.94
Morocco	27.03	9.67	1.34	7.08	1.25	0.45	3.50	1.45	2.05	11.54	29.56	6.51	19.52
Mozambique	16.00	1.75	0.32	1.32	0.11	0.03	18.44	17.32	1.12	0.66	1.21	0.02	6.80
Namibia	1.54	I.D	0.10	0.19	I.D	I.D	I.D	I.D	I.D	0.28	I.D	I.D	I.D
Niger	9.15	2.81	0.31	2.01	0.48	0.00	5.87	5.50	0.36	0.63	1.17	0.03	3.41
Nigeria	111.72	21.90	3.05	13.99	4.85	0.65	111.22	102.78	8.45	4.65	93.09	2.60	57.23
Rwanda	7.95	I.D	0.06	I.D	I.D	0.00	5.67	5.39	0.28	0.81	0.52	0.01	2.27
Senegal	8.31	2.01	0.46	1.35	0.20	0.27	5.27	4.50	0.77	1.70	3.85	0.59	6.40
Sierra Leone	4.51	0.65	0.07	0.52	0.06	0.05	3.33	3.20	0.13	0.45	0.76	I.D	2.31

Units per year	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	TOTAL CONSUMPTION PRESSURE
	(millions)	Total (million t grain-equivalent)	Meat (million t grain-equivalent)	Food grain (million t)	Seed, waste, and processing (million t)	Marine (million t)	Total (million m <sup>3</sup> wrme)	Fuelwood and charcoal (million m <sup>3</sup> )	Timber, pulp, and paper (million m <sup>3</sup> wrme)	Withdrawals (billion m <sup>3</sup> )	Emissions (million t)	(million t)	(million average consumer equivalents)
<b>AFRICA cont.</b>													
Somalia	9.25	I.D	0.30	I.D	I.D	0.01	8.79	8.69	0.11	0.91	I.D	0.03	I.D
South Africa	41.47	13.82	5.13	7.74	0.95	1.19	23.13	7.04	16.09	14.89	313.27	9.08	49.52
Sudan	28.10	6.54	1.59	4.43	0.52	0.01	25.45	23.06	2.39	17.80	3.64	0.25	15.78
Tanzania	29.69	5.49	1.20	3.30	0.99	0.04	36.75	34.59	2.16	1.19	2.60	0.80	14.90
Togo	4.14	0.60	0.11	0.38	0.11	0.04	2.41	2.16	0.25	0.12	0.74	0.35	1.68
Tunisia	8.90	2.63	0.50	1.79	0.34	0.07	4.40	3.36	1.05	3.39	15.91	4.31	7.90
Uganda	21.30	2.61	0.75	1.25	0.61	I.D	17.24	14.94	2.30	0.20	1.05	0.13	7.84
Zambia	9.46	2.04	0.28	1.51	0.26	0.01	14.59	13.44	1.16	1.76	2.52	0.30	6.14
Zimbabwe	11.26	2.11	0.27	1.65	0.20	0.00	8.08	6.27	1.81	1.53	9.74	1.00	4.97
Regional total	724.05	140.70	30.49	94.27	18.16	4.37	580.47	511.81	68.65	165.68	768.52	57.03	401.46
<b>MIDDLE EAST AND CENTRAL ASIA</b>													
Afghanistan	20.14	I.D	0.62	I.D	I.D	I.D	7.68	5.99	1.69	35.70	1.25	0.11	I.D
Armenia	3.60	1.08	0.20	0.53	0.36	I.D	I.D	I.D	I.D	4.11	3.65	0.20	I.D
Azerbaijan	7.56	2.59	0.30	1.37	0.92	I.D	I.D	I.D	I.D	17.06	42.61	0.20	I.D
Georgia	5.46	2.12	0.47	0.98	0.66	0.03	I.D	I.D	I.D	4.05	7.75	0.10	3.49
Iran	67.28	19.68	3.89	14.20	1.59	0.72	8.50	2.56	5.94	85.61	265.66	16.32	64.85
Iraq	20.45	3.61	0.44	2.71	0.47	0.00	0.16	0.11	0.05	52.26	99.07	18.02	32.07
Israel	5.63	1.90	0.97	0.82	0.11	0.30	2.24	0.01	2.22	2.28	48.21	3.50	9.75
Jordan	5.44	1.25	0.35	0.82	0.08	0.02	0.51	0.01	0.50	0.91	14.08	4.01	4.57
Kazakhstan	17.11	9.50	3.21	3.76	2.53	I.D	0.01	0.00	0.00	44.14	221.64	1.80	32.26
Kuwait	1.55	0.52	0.29	0.20	0.02	0.02	0.31	0.06	0.25	0.47	50.48	2.00	4.15
Kyrgyzstan	4.75	1.66	0.62	0.62	0.42	I.D	I.D	I.D	I.D	12.95	5.47	0.30	I.D
Lebanon	3.01	0.82	0.37	0.41	0.03	0.00	0.86	0.51	0.35	1.18	13.86	3.00	3.65
Oman	2.16	I.D	0.19	I.D	I.D	0.07	0.22	0.00	0.22	0.52	12.30	1.40	2.91
Saudi Arabia	17.88	5.38	1.99	3.00	0.40	0.20	3.39	0.09	3.30	5.09	291.53	16.02	30.35
Syria	14.66	4.95	0.55	3.40	1.00	0.01	0.49	0.02	0.47	10.91	46.37	6.01	11.77
Tajikistan	6.10	2.13	0.21	1.15	0.77	I.D	I.D	I.D	I.D	14.95	3.74	0.10	I.D
Turkey	61.95	25.29	3.44	14.43	7.41	0.70	21.68	8.54	13.14	36.24	167.42	28.50	62.86
Turkmenistan	4.10	1.70	0.41	0.77	0.52	I.D	I.D	I.D	I.D	26.19	28.35	0.40	I.D
United Arab Emirates	2.38	0.96	0.59	0.30	0.06	0.12	1.02	0.03	0.99	0.82	70.52	I.D	6.21
Uzbekistan	22.84	9.42	2.25	4.29	2.88	I.D	0.00	0.00	0.00	91.84	98.95	3.50	42.32
Yemen	14.50	2.97	0.50	2.38	0.09	0.09	0.48	0.32	0.16	3.40	14.89	1.00	4.80
Regional total	308.54	97.51	21.88	56.13	20.31	2.27	47.55	18.27	29.28	450.68	1 507.82	106.52	341.69
<b>ASIA/PACIFIC</b>													
Australia	18.09	10.02	6.68	1.89	1.45	0.71	28.05	2.88	25.17	27.31	298.43	6.01	44.43
Bangladesh	120.43	23.35	1.20	20.52	1.64	0.20	32.28	31.31	0.97	26.47	20.98	0.28	31.66
Bhutan	1.64	I.D	0.03	I.D	I.D	I.D	1.47	1.42	0.05	0.02	0.24	0.14	I.D
Cambodia	10.25	2.53	0.43	1.82	0.29	0.02	7.55	6.68	0.87	0.66	0.50	I.D	4.66
China	1 221.46	435.76	176.81	221.88	37.07	15.23	316.47	204.24	112.23	504.32	3 197.94	430.00	1 040.37
Hong Kong	5.87	3.20	2.45	0.69	0.05	0.34	5.89	0.31	5.58	0.93	46.76	1.92	10.47
India	935.74	184.07	15.67	150.93	17.47	2.16	300.58	274.24	26.34	607.23	911.42	60.60	443.05
Indonesia	197.59	47.05	6.18	37.36	3.51	2.89	177.41	150.32	27.09	83.06	298.70	24.10	156.78

	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	TOTAL CONSUMPTION PRESSURE
Units per year		Total (million t grain-equivalent)	Meat (million t grain-equivalent)	Food grain (million t)	Seed, waste, and processing (million t)		Total (million m <sup>3</sup> wrme)	Fuelwood and charcoal (million m <sup>3</sup> )	Timber, pulp, and paper (million m <sup>3</sup> wrme)				
	(millions)					Marine (million t)				Withdrawals (billion m <sup>3</sup> )	Emissions (million t)	(million t)	(million average consumer equivalents)
ASIA/PACIFIC cont.													
Japan	125.10	38.69	19.10	16.13	3.46	12.38	58.60	0.66	57.94	91.95	1 164.17	79.60	294.17
Korea, D.P.R.	23.92	5.37	0.83	3.79	0.75	1.64	5.19	4.32	0.87	16.41	257.17	17.02	48.22
Korea, Rep.	45.00	16.85	6.39	7.55	2.91	2.76	17.85	4.85	13.01	29.56	390.84	56.50	105.76
Laos	4.88	1.24	0.19	0.88	0.17	0.00	5.37	4.51	0.86	1.26	0.31	I.D	3.06
Malaysia	20.14	5.68	2.90	2.55	0.23	0.80	40.56	9.71	30.85	13.06	107.47	10.68	38.29
Mongolia	2.41	0.94	0.57	0.29	0.08	0.00	0.51	0.38	0.13	0.66	8.46	0.11	1.26
Myanmar	46.53	12.60	1.21	10.27	1.12	0.61	23.04	20.39	2.65	4.69	7.06	0.52	21.55
Nepal	21.92	5.75	0.74	4.36	0.65	I.D	20.83	20.20	0.63	3.28	1.53	0.22	12.12
New Zealand	3.58	2.22	1.72	0.35	0.16	0.06	I.D	I.D	I.D	1.99	30.14	0.70	4.86
Pakistan	140.50	28.94	6.19	20.98	1.77	0.38	30.72	28.12	2.60	278.84	85.88	8.60	109.81
Papua New Guinea	4.30	0.64	0.30	0.33	0.01	0.11	8.79	5.53	3.25	0.12	2.56	I.D	4.98
Philippines	67.58	15.64	5.76	9.25	0.62	2.34	41.24	36.32	4.92	49.04	63.15	9.81	66.72
Singapore	2.85	I.D	0.73	I.D	I.D	0.13	2.15	0.06	2.09	0.19	99.22	1.90	9.00
Sri Lanka	18.35	3.30	0.30	2.81	0.20	0.28	9.30	8.94	0.37	10.41	7.19	0.90	10.94
Taiwan	21.30	7.51	5.01	2.14	0.36	2.65	10.21	0.01	10.20	I.D	181.69	26.81	72.84
Thailand	58.79	12.46	3.58	7.09	1.79	2.94	43.11	36.58	6.53	35.04	175.17	33.60	89.34
Viet Nam	74.55	20.25	4.83	13.51	1.90	0.73	35.23	30.49	4.74	30.85	31.73	7.51	42.97
Regional total	3 192.75	884.04	269.81	537.35	77.64	49.37	1 222.40	882.47	339.93	1 817.34	7 388.72	777.53	2 649.26
LATIN AMERICA AND THE CARIBBEAN													
Argentina	34.59	18.20	11.96	4.49	1.75	0.31	12.65	5.18	7.47	35.81	130.56	6.41	35.62
Bolivia	7.41	2.27	1.17	0.92	0.18	0.01	2.52	1.27	1.25	1.56	10.48	0.70	3.32
Brazil	161.79	59.24	35.62	16.79	6.83	0.80	208.14	135.61	72.53	46.86	255.20	28.00	141.68
Chile	14.26	5.01	2.86	1.94	0.20	2.65	21.97	9.98	11.99	23.20	44.14	3.00	46.62
Colombia	35.10	8.70	4.83	3.53	0.33	0.41	21.58	17.79	3.79	6.03	67.57	9.64	26.15
Costa Rica	3.42	0.97	0.54	0.39	0.04	0.02	5.39	3.36	2.02	1.35	5.24	0.99	3.48
Cuba	11.04	2.03	0.81	1.11	0.12	0.12	3.24	2.54	0.70	9.59	29.26	1.20	7.81
Dominican Rep.	7.82	1.78	0.99	0.70	0.09	0.09	1.55	0.98	0.56	3.48	11.78	1.45	4.75
Ecuador	11.46	2.49	1.31	1.05	0.14	0.15	11.13	5.19	5.94	6.68	23.44	2.30	10.35
El Salvador	5.77	1.36	0.36	0.93	0.08	0.01	7.09	6.66	0.43	1.00	5.19	0.88	3.93
Guatemala	10.62	2.31	0.56	1.59	0.15	0.01	14.43	13.33	1.10	1.50	7.19	1.56	7.27
Haiti	7.18	I.D	0.24	I.D	I.D	0.02	6.48	6.18	0.30	0.05	0.66	0.05	2.56
Honduras	5.65	1.09	0.28	0.72	0.09	0.01	6.55	5.87	0.68	1.66	3.86	0.66	3.66
Jamaica	2.45	0.55	0.28	0.24	0.03	0.05	1.02	0.53	0.49	0.41	9.15	0.52	1.96
Mexico	93.67	34.91	14.38	16.54	3.99	1.35	27.63	16.31	11.32	84.21	359.58	21.00	91.68
Nicaragua	4.43	0.83	0.19	0.58	0.07	0.01	3.78	3.66	0.11	1.69	2.70	0.35	2.39
Panama	2.63	0.84	0.47	0.32	0.04	0.09	1.27	0.95	0.32	1.98	6.90	0.35	2.79
Paraguay	4.96	2.13	1.56	0.38	0.19	0.00	10.07	6.52	3.55	0.54	3.81	0.57	4.75
Peru	23.78	4.68	1.93	2.51	0.24	0.92	13.03	10.68	2.34	18.73	30.58	2.10	23.43
Puerto Rico	3.67	I.D	0.26	I.D	I.D	0.00	I.D	I.D	I.D	I.D	16.08	1.42	I.D
Trinidad and Tobago	1.31	0.28	0.10	0.15	0.02	0.01	0.25	0.02	0.23	0.15	17.91	0.60	1.54
Uruguay	3.19	1.82	1.29	0.35	0.17	0.03	4.25	3.05	1.20	4.33	5.77	0.60	4.29
Venezuela	21.84	7.36	3.89	2.75	0.72	0.43	3.73	0.90	2.83	4.10	184.78	6.91	22.95
Regional total	478.06	158.83	85.89	57.96	15.47	7.50	387.76	256.58	131.18	254.89	1 231.83	91.27	454.22

Units per year	POPULATION	GRAIN				FISH	WOOD			FRESHWATER	CO <sub>2</sub>	CEMENT	TOTAL CONSUMPTION PRESSURE
	(millions)	Total (million t grain-equivalent)	Meat (million t grain-equivalent)	Food grain (million t)	Seed, waste, and processing (million t)	Marine (million t)	Total (million m <sup>3</sup> wrme)	Fuelwood and charcoal (million m <sup>3</sup> )	Timber, pulp, and paper (million m <sup>3</sup> wrme)	Withdrawals (billion m <sup>3</sup> )	Emissions (million t)	(million t)	(million average consumer equivalents)
<b>NORTH AMERICA</b>													
Canada	29.46	16.50	10.30	2.79	3.41	0.93	53.35	5.21	48.14	47.25	440.58	6.90	69.14
United States	263.25	182.29	113.47	30.15	38.66	6.07	548.09	94.95	453.14	492.26	5219.47	87.90	722.58
Regional total	292.71	198.79	123.77	32.95	42.08	7.00	601.44	100.16	501.28	539.51	5660.05	94.80	791.72
<b>WESTERN EUROPE</b>													
Austria	7.97	4.34	3.09	0.76	0.50	0.21	5.85	3.35	2.50	2.42	59.95	6.00	13.41
Belgium/Luxembourg	10.52	4.91	3.34	1.06	0.52	0.49	8.51	0.68	7.83	9.03	128.97	6.24	22.20
Denmark	5.18	3.07	1.93	0.54	0.61	0.70	7.00	0.55	6.45	1.21	61.97	1.00	14.52
Finland	5.11	2.13	1.21	0.42	0.50	0.33	9.03	4.14	4.89	2.24	52.99	1.00	10.69
France	57.98	28.36	19.32	6.56	2.48	2.08	57.10	10.00	47.10	38.57	360.10	20.00	91.90
Germany	81.59	36.16	23.98	7.19	4.99	1.20	63.46	4.25	59.21	47.30	859.20	38.00	124.11
Greece	10.45	4.98	2.87	1.55	0.56	0.40	3.71	1.33	2.38	6.95	90.24	7.00	18.22
Ireland	3.55	1.80	0.99	0.47	0.35	0.14	3.47	0.07	3.40	0.80	33.74	2.00	6.43
Italy	57.19	27.47	16.95	9.08	1.44	1.74	34.30	5.65	28.65	56.36	425.30	32.50	97.24
Netherlands	15.50	6.87	4.92	1.07	0.87	1.67	9.01	0.25	8.76	8.04	179.71	5.00	36.70
Norway	4.34	1.57	0.92	0.50	0.15	1.09	3.39	0.86	2.52	0.20	74.86	1.40	17.34
Portugal	9.82	4.16	2.56	1.24	0.35	0.65	3.57	0.60	2.97	7.26	55.04	8.00	19.74
Spain	39.62	18.42	12.68	4.07	1.66	2.34	20.62	2.66	17.95	30.97	248.15	25.50	76.06
Sweden	8.78	3.45	2.06	0.87	0.52	0.38	20.53	3.88	16.65	2.99	49.36	2.10	15.95
Switzerland	7.20	2.83	1.92	0.72	0.19	0.22	7.28	0.83	6.45	1.15	42.67	4.01	10.77
United Kingdom	58.26	22.66	13.97	5.49	3.20	2.31	39.73	0.45	39.27	11.93	565.95	13.00	83.16
Regional total	383.06	173.19	112.70	41.59	18.89	15.94	296.55	39.57	256.99	227.43	3 288.20	172.75	658.43
<b>CENTRAL AND EASTERN EUROPE</b>													
Albania	3.44	1.06	0.37	0.41	0.27	0.00	0.44	0.35	0.09	0.36	1.85	0.20	1.02
Belarus	10.14	5.94	2.54	2.03	1.37	I.D	9.86	0.81	9.05	2.98	59.35	1.24	12.07
Bosnia and Herzegovina	3.46	I.D	0.24	I.D	I.D	0.00	I.D	I.D	0.04	1.49	1.84	0.15	I.D
Bulgaria	8.77	4.31	1.66	1.43	1.23	0.02	2.77	0.86	1.91	13.58	57.60	2.10	10.65
Croatia	4.05	1.18	0.54	0.43	0.21	0.03	2.45	0.90	1.55	1.94	17.14	1.70	4.04
Czech Rep.	10.30	5.39	3.27	1.24	0.88	0.11	10.82	0.69	10.13	2.74	112.13	4.83	15.85
Estonia	1.53	0.57	0.28	0.17	0.12	0.06	3.42	0.55	2.86	3.22	16.74	0.42	3.74
Hungary	10.12	4.99	2.67	1.22	1.11	0.18	5.52	1.85	3.67	6.68	55.92	3.00	12.20
Latvia	2.56	I.D	0.49	I.D	I.D	0.09	5.67	0.90	4.77	0.67	9.32	0.20	3.97
Lithuania	3.70	2.29	0.79	0.89	0.60	0.12	4.77	1.00	3.77	4.42	14.82	0.65	6.04
Macedonia	2.16	0.71	0.28	0.30	0.14	0.02	0.84	0.64	0.20	0.93	10.76	0.50	1.89
Moldova	4.43	1.76	0.42	0.80	0.54	I.D	0.17	I.D	0.17	3.79	10.82	0.05	2.93
Poland	38.39	19.16	9.37	5.96	3.83	0.41	18.75	2.51	16.24	12.35	340.52	13.90	46.71
Romania	22.84	13.54	4.51	4.61	4.41	0.10	11.87	2.77	9.10	25.17	121.18	6.01	27.31
Russian Federation	147.00	69.16	29.96	23.44	15.76	2.97	96.27	28.71	67.56	116.42	1 819.33	35.30	225.44
Slovakia	5.35	2.38	1.14	0.65	0.59	I.D	4.37	0.41	3.96	1.81	38.06	2.50	7.55
Slovenia	1.95	1.10	0.68	0.28	0.15	0.03	1.70	0.18	1.52	0.84	11.72	1.00	2.81
Ukraine	22.59	22.59	8.34	8.34	5.61	0.45	0.03	I.D	0.03	34.62	438.53	11.01	51.37
Yugoslavia	10.85	6.55	3.71	1.58	1.26	0.15	1.25	0.02	1.23	4.69	33.06	1.70	9.17
Regional total	342.85	162.68	71.56	53.78	38.08	4.76	180.94	43.15	137.83	238.70	3 170.70	86.48	440.94



# LIVING PLANET INDEX additional data

Table 1: WWF LIVING PLANET INDEX: 1960-1995

Year	1960	1965	1970	1975	1980	1985	1990	1995
Living Planet Index			100	99	96	89	81	68
Forest Index	104	102	100	98	96	93	91	89
Freshwater Index			100	105	100	84	68	48
Marine Index			100	95	93	91	82	67

Table 2: ORIGINAL AND CURRENT FOREST COVER: showing fragmentation and plantation areas in million km<sup>2</sup>

	Africa	Middle East and Central Asia	Asia/Pacific	Asia/Pacific inc. Middle East and Central Asia	Latin America and the Caribbean	North America	Europe	Russian Federation	WORLD TOTAL
Original Forest Cover	13.761	I.D	I.D	15.487	11.839	9.604	5.186	12.049	67.925
Forest Cover, 1990	4.745	0.168	4.603	4.771	7.653	6.967	1.815	8.150	34.102
Fragments 50 to <500km <sup>2</sup>	0.419	0.038	0.478	0.516	0.180	0.169	0.270	0.379	1.933
Fragments <50km <sup>2</sup>	0.462	0.041	0.105	0.146	0.136	0.275	0.204	0.153	1.376
Plantation area	0.059	0.004	0.847	0.850	0.104	0.294	0.563	0.167	2.036

**NOTE:**

Current forest cover includes fragments and plantation areas.  
Figures for fragments include some plantation areas.

Figures for plantation areas include some fragments of less than 500km<sup>2</sup> and less than 50km<sup>2</sup>.  
Figures for Europe include Central, Eastern, and Western Europe but exclude the Russian Federation.

Table 3: NATURAL FOREST COVER: regional 1960-1990 and world 1960-1995 area in million km<sup>2</sup>

Year	1960	1965	1970	1975	1980	1985	1990	1995
Africa	5.906	5.720	5.533	5.321	5.110	4.898	4.686	
Asia/Pacific	5.301	5.066	4.830	4.594	4.358	4.140	3.921	
Latin America and the Caribbean	9.688	9.361	9.034	8.676	8.318	7.934	7.550	
North America	6.705	6.705	6.705	6.705	6.705	6.689	6.673	
Europe	1.139	1.171	1.202	1.219	1.236	1.244	1.252	
Russian Federation	7.983	7.983	7.983	7.983	7.983	7.983	7.983	
<b>Total</b>	<b>36.723</b>	<b>36.005</b>	<b>35.287</b>	<b>34.498</b>	<b>33.709</b>	<b>32.887</b>	<b>32.066</b>	<b>31.260</b>

**NOTE:**

Natural forest cover excludes plantations.