

the Land

the Land

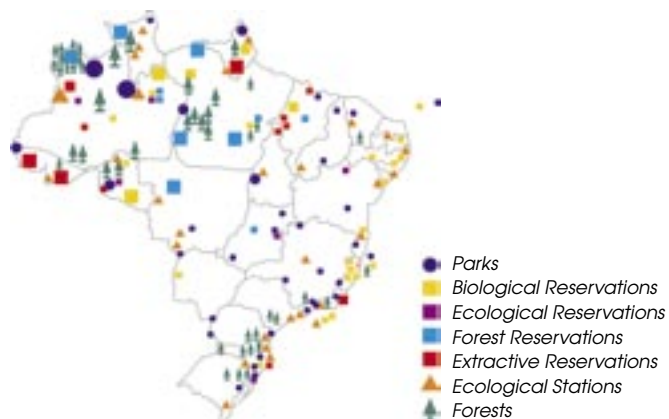


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Brazil is the largest Latin American country, covering nearly half (47,3 per cent) of the South American continent and occupying an area of 8 511 965 km². It is the fifth largest country in the world after the Russian Federation, Canada, China and the United States.

Except for a small number of islands, Brazil consists of a single, unbroken land mass. On a map of the world, it can be seen that the eastern bulge of Brazil conforms to the concave curve of the west coast of Africa. According to the theory of continental drift, this is no accident. Africa and South America once abutted on each other, but drifted apart over millions of years.

The Equator passes through the north of the country near Macapá. The Tropic of Capricorn passes through the south near São Paulo. Brazil's greatest width, 4 319,4 km, is almost the same as its greatest distance from north to south, 4 394,7 km.

Brazil has ten neighbours: French Guiana and the countries of Suriname, Guyana, Venezuela and Colombia bound Brazil to the north, Uruguay and Argentina to the south, and Paraguay, Bolivia and Peru to the west. Ecuador and Chile are the only two countries of continental South America that do not share a border with Brazil. The Atlantic Ocean extends along the entire eastern side of the country, giving it a coastline of 7 367 km.

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standard time

Owing to the distance separating its east-west extreme points (4 319,4 km) the country has four time zones. In most of the Brazilian territory, the time is three hours earlier than the standard Greenwich Mean Time (GMT). When it is 09:00 in Greenwich, it is 06:00 in Brasília, the capital of Brazil.

Between the months of October and February, during summer, the country adopts daylight saving time, setting the clock forward by one hour, in the South-eastern, West-central and Southern Regions, and the States of Bahia (North-eastern Region) and Tocantins (Northern Region).

standard time



geology and mineral resources

The national territory contains rocks that originated during the Archaean period, more than 2 600 million years ago, as well as those still being formed. Igneous, metamorphic and sedimentary rocks are present, the last-mentioned still not consolidated. The tectonic compartmentation contains cratons such as the Amazon, São Luís, São Francisco, Luís Alves and Rio de La Plata, the central massif of Goiás, folds such as the Araguaia-Tocantins, Uruaçu, Paraguay, Brasília, Araçuaí, Ribeira, upper Rio Grande, Rio Preto, Espinhaço and Sergipana, and sedimentary basins such as those of the Amazon, Solimões, Paraná and Parnaíba rivers.

Brazil is known to possess extremely rich mineral deposits, although these have yet to be comprehensively surveyed. Brazil has the world's sixth largest reserve of commercially recoverable iron ore, some 20,3 billion tons, 8,6 per cent of the world total. The iron content is high, varying from 50 to 70 per cent for haematite and itabirite. Most of the deposits – nearly 95 per cent – are concentrated in the states of Minas Gerais and Pará. Minas Gerais alone accounts for 75 per cent. Brazil's identified deposits

*geology
and
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are sufficient to supply the world demand for iron (based on current levels and predictable growth) for the next 20 years. In addition to iron ore, Brazil has the world's fifth largest reserves of manganese, with proven deposits of 53,8 billion tons, the world's third largest reserves of bauxite (3,9 billion tons) and 5,2 per cent of the world's reserves of nickel (8,9 million tons). The state of Goiás holds 74 per cent of Brazil's deposits. Brazil possesses reserves of potassium, uranium, niobium (a rare metal used to make super alloys for jet engines and superconductors), phosphate, tungsten (an element used for hardening steel), cassiterite (the chief source of tin), lead, graphite, chrome, gold, zirconium (a strong ductile metallic element with many industrial uses), and the rare mineral, thorium, a radioactive metallic element.

Ninety per cent of the world's supply of gems, such as aquamarines, topazes, amethysts, tourmalines and emeralds are produced in Brazil.



The shaping of the earth's surface is dynamic, and results from the joint action of internal and external agents. Geological structure, tectonic movements, climate and living beings are the elements that construct and destroy relief, and are finally responsible for the diversity of features that form the external surface of the earth's crust.

The Brazilian landscape developed over an old geological base which, for a long time, was subject to the action of erosion without the occurrence of recent tectonic movements that would have created high mountain ranges. Therefore, predominant altitudes are no higher than 500 m (78,03 per cent of the territory), while a small area presents elevations over 1 200 m (0,54 per cent).

relief

The Brazilian landscape is dominated by two prominent features: the Amazon River with its surrounding lowland basin of 4 000 000 km² and the Central Highlands, a plateau that rises southward from the great river. Most of the Central Highlands consist of a tableland varying in altitude from 300 to 500 m above sea level, broken by a number of low mountain ranges and cut by deep valleys. The highlands ascend steeply in the east forming an escarpment, where

The Amazon river

The Amazon river,

the world's largest river in water volume, is 6 577km long.

The river is navigable by ocean liners up to 3 885km upstream, reaching Iquitos in Peru.



rivers

Brazil has a vast and dense hydrographic network. Owing to relief features, there is a predominance

rivers

several peaks attain an altitude of 2 500 m or more, and then drop precipitously to a narrow Atlantic coastal plain. A network of high mountain ranges runs from the south of the country to the north-east, forming a continental divide between the Atlantic Ocean and the interior. Brazil's highest point, Pico da Neblina, reaches 3 014 m and is found in the north, close to the Venezuelan border.

of highland rivers that, among other characteristics, present a great potential for hydroelectric power production.

Brazil has one of the most extensive river systems in the world with eight drainage basins. The Amazon and the Tocantins-Araguaia basins in the north account for 56 per cent of Brazil's total drainage area. The Amazon River, the world's largest river in water volume and second longest after the Nile, is 6 577 km long, of which 3 615 km are in Brazilian territory. The river is navigable by ocean liners up to 3 885 km upstream, reaching Iquitos in Peru.

The Paraná-Paraguai river system drains the area from the south-western portion of the state of Minas

Gerais southward until it reaches the Atlantic through the Rio da Prata near Buenos Aires, Argentina. Brazil's two southernmost states are drained by the Uruguay River also into the Prata.

The São Francisco River is the largest river that is entirely within Brazil, flowing for more than 1 609 km northwards before it turns eastward into the Atlantic. Like the Paraná and the Tocantins, its source is in the Central Highlands of the country. The upper river is navigable in some areas for shallow draft riverboats, and only the last 277 km of the lower river is navigable for ocean-going ships.

rivers



climate

The Brazilian geographic configuration, which is bordered by the ocean from north to south, with a continental scale and relief features, combined with atmospheric systems dynamics, results in wide-ranging climatic diversity with regional differences.

The higher annual temperature measurements (26 °C to 28 °C) occur in the interior of the north-eastern region and the mid-and lower Amazon River. The lowest values (less than 18 °C) occur in the hilly areas of the south-eastern region's depressions, valleys and lowlands, the Central West's Pantanal and lower areas and in the South

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region's central depressions and the Uruguay River valley. The lowest temperatures, however, often show negative values, occurring on the highest peaks of the south-east and most of the Southern Region, where frost and snow may occur.

Although 90 per cent of the country is within the tropical zone, more than 60 per cent of the population lives in areas where altitude, sea winds, or cold polar fronts moderate the temperature. Plateau cities such as São Paulo, Brasília, and Belo Horizonte have very mild climates averaging 19 °C. Rio de Janeiro, Recife and Salvador on the coast have warm climates balanced by the constancy of the trade winds. In the southern cities of Porto Alegre and Curitiba, the subtropical climate is similar to parts of Southern Africa with frost occurring frequently. Winter temperatures can fall to below freezing.

Despite the popular image of the Amazon as a region of stifling heat, temperatures of more than 32 °C are rarely experienced. Instead, the annual average temperature in the Amazon region is in the range of 22 to 26 °C, with only very small seasonal variations between the warmest and the coldest months. The hottest part of Brazil is the north-east where, during the dry season, between May and November, temperatures of more than 38 °C are frequently recorded. The north-east has greater seasonal variation in temperatures than does the Amazon region. Along the Atlantic coast





from Recife to Rio de Janeiro, temperatures range from 23 to 27 °C. Inland, on higher ground, temperatures are lower, ranging from 18 to 21 °C. South of Rio, the seasons are more noticeable and the annual temperature range is greater. The average temperature for this part of the country is between 17 and 19 °C.

Brazil's rainy areas correspond to Pará's coastal lands and western Amazonas, where the annual rainfall values surpass 3 000 mm. There is less rain in the north-eastern region, where annual values are less than 500 mm. Maximum precipitation occurs during summer and autumn in most of the country, except for Roraima and north Amazonas where the rainy

season occurs during the winter because these two states are located in the Northern Hemisphere.

Brazil's most intense rainfall occurs around the mouth of the Amazon River near the city of Belém, as well as in the vast upper regions of Amazonia. Another important region of heavy rainfall is along the edge of the great escarpment in the state of São Paulo. Most of Brazil, however, has a fairly moderate rainfall of between 1 000 and 1 500 mm a year, with rainfalls occurring mostly in the summer, between December and April. The winters tend to be dry. The driest part of the country is the north-east, the so-called polygon of drought, encompassing ten per cent of the country's territory. In this region rainfall is unpredictable and the evaporation rate is very high, making it difficult to raise crops. Along the coastline, south of Recife, the mountains trigger rainfall from the trade winds. In some places behind the mountains, such as the region south of Salvador, the hinterland is dry because the rain is dumped on the mountains leaving very little for the area below.

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seasons

Seasons in Brazil are much the same as in southern Africa: spring lasts from about 22 September until 21 December and summer can be expected to last from 22 December until 21 March. Autumn begins around 22 March and continues until about 21 June and winter can be expected to run from 22 June until 21 September. In most regions of Brazil, the seasons are not well defined, being divided mainly into two: the rainy season ('summer') and the dry season ('winter').

seasons

Tropical zone

Although 90 per cent of the country is within the tropical zone, more than 60 per cent of the population lives in areas where altitude, sea winds, or cold polar fronts moderate the temperature



vegetation

The variation in climate, together with soil and drainage conditions, is reflected by Brazil's vegetation. In the Amazon Basin and in those places along the Atlantic coast where the rainfall is very heavy, one finds a tropi-



flora

Owing to the vast area of tropical country, Brazil is endowed with an extraordinary botanical variety. The Amazon region, 5 217 423 km² in extent, comprising the States of Acre, Rondônia, Amazonas, Pará, Roraima, Amapá, Mato Grosso and the largest part of the States of Tocantins

Flora

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vegetation

cal rain forest composed of luxuriant broadleaf evergreen trees. The rain forest is made up of a huge variety of different species, an estimated 3 000 in 2,6 km². In the lowlands and plateaux of the eastern coast trees are smaller than in the rain forest and lose their leaves in the dry season. In the semi-arid north-east, the *caatinga*, a dry bush, predominates. The greater portion of the central part of Brazil is covered by a woodland savannah known as the *cerrado*. This is a special type of land combining sparse scrub trees and drought-resistant grasses. In

the south, needle-leaved pinewoods (Paraná pine or *Araucária*) cover the highlands; grassland covers the sea-level plains. The Mato Grosso swamp-land (Pantanal Mato-grossense), a plain that covers 230 000 km² in the western portion of the centre of the country, is covered by tall grass, weeds and widely dispersed trees. Large patches of it are submerged during the rainy season. The Amazon Basin and the Pantanal, already altered by the actions of humankind, constitute two of the world's largest biological reserves.

and Maranhão, still preserves most of its natural vegetation. The country's richest forests are found in this region, where they originally covered approximately 64 per cent of the area. Grasslands covered about 18 per cent and the remainder consisted of other forms of vegetation, such as pioneer formations and areas of ecological tension.

The other regions show very fragmented vegetation, represented by small, scattered areas such as woods,

savannahs and areas of ecological tension.

A Brazilian Institute of Geography and Statistics (IBGE) survey in progress, through specialised bibliographies, has compiled up to now some 3 500 plant species with economic significance to the fields of medicine, nutrition, manufacturing and commerce of plant products. Also recorded are 1 304 applications with economic value, 8 446 common names and 2 219 chemical substances.

Flora

fauna



fauna

Brazilian fauna, although including a very high index of diverse species, contains relatively few individuals in each species. Many species inhabit restricted areas (endemic species). Thus fauna is very fragile and susceptible to human influence on their environment (anthropogenic activities). In Brazil there are about 4 430 species of vertebrate animals, among which are mammals, reptiles, amphibians and fish. Seventy per cent of the 1 000 000 species of invertebrates are insects.

Of the 12 categories of mammals which inhabit the tropics of the Western Hemisphere, 11 are found in Brazil,

representing more than 600 species. They include several species of felines such as the jaguar and smaller cats such as the puma, jaguarundi and the ocelot. Other mammals include: sloths, anteaters, tapirs, armadillos, marine and river dolphins, capybaras (a large aquatic rodent, some weighting up to 66 kg), and 30 species of monkeys. With 1 600 species, including many varieties of parrots, Brazil has a larger variety of birds than any other country. There are at least 40 species of turtles, 120 of lizards, 230 of snakes, five species of alligators, 331 species of amphibians and 1 500 species of freshwater fish. A study conducted by IBGE in 2000



identified 14 species of mammals and 12 species of birds in danger of extinction in Brazil. The extinction of many of these species from the Brazilian fauna is caused mainly by the activities of humans in their environment, by the destruction of their habitats as well as by indiscriminate hunting. The 26 species/subspecies that are almost extinct include the lion tamarin (*mico leão-dourado*), the jaguar (*onça-pintada*), the little blue macaw or Spix's macaw (*ararinha-azul*), the marsh deer (*cervo-do-pantanal*) and the leatherback turtle (*tartaruga-marinha-de-couro*).

The Amazon forest and the Pantanal wetlands, although suffering the effects of human intervention, are two of the largest wildlife reservations on earth. The Amazon forest contains the single largest reserve of biological

* The ferocity of the meat-eating piranha has been exaggerated. Although it is true that some species in rare circumstances have killed large animals and even people, their behaviour depends on the state of their habitat. In main river channels and in larger lakes they appear to leave swimmers unmolested. Only when they lack food do they become aggressive.



organisms in the world. Scientists estimate that there are between 800 000 and 5 000 000 species living there, amounting to 15 to 30 per cent of all the species in the world. As naturalists catalogue new species of freshwater fish, their findings suggest that there may be as many as 3 000 kinds of fish in the Amazon rivers and lakes. Among the fish found in the area are: the pirarucu, said to be the largest freshwater fish in the world with specimens measuring over 2 m in length and weighing 125 kg; the tambaqui, a member of the fruit-eating characin family which has teeth that can crack seeds as hard as those of the rubber tree and the jauari palm, and the *piranha*.*



The Amazon forest

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environmental conservation units

environmental conservation units

There are 13 types of environmental conservation units in Brazil, namely the Permanent Preservation Area (70), the Environmental Protection Area (105), the Special Protection Area (5), the Relevant Ecological Interest Area (24), the Ecological Station (59), the Forest (50), the Natural Monument (3), the Park (113), the Ecological Park (16), the Forest Park (31), the Biological Reservation (76), the Ecological Reservation (65), the Forest Reservation (30) and the Extractive Reservation (9). These special units are administered by federal, state and local agencies, and some of them by private citizens.

environmental conservation units

Created in 1932, the Cataguases State Park (Minas Gerais) is the oldest park. Itatiaia (Rio de Janeiro) was created in 1937 and was the first to come under the federal government. Jaú National Park (Amazonas), with an area of 2 272 000 ha, roughly the size of Lesotho, is the largest park, and Ubajara (Ceará), with 563 ha, is the smallest.

The most recent type of environmental conservation unit is the extractive reservation, which was created in 1990 for the self-sustainable exploitation and conservation of renewable natural resources. The most extensive one, with 970 570 ha, is the Chico Mendes Extractive Reservation (Acre).



indian lands

indian lands

The National Foundation for Indians (FUNAI) regards as Indian Lands the physical space permanently occupied by tribal groups. Although Indians have the usufruct of everything the land contains, they do not have ownership of it.

In Brazil, there are 575 Indian territories with a total surface area of 946 452 km² (11,12% of the country's area), corresponding to an area larger than Namibia. From this total, 220 areas (436 400 km²) were already delimited, corresponding to 47,24 per cent. These areas are inhabited by 701 642 Indians of 215 different ethnic groups, who speak 170 different dialects. They are concentrated mainly in the Amazon, but are spread all over the country.

In Roraima State, in the extreme north of Brazil, there are Indian reservations covering an area of 94 190 km², occupied by 9 910 Yanomami Indians, which corresponds to one Indian for each 10 km².

The number of indigenous peoples increases almost thrice as fast as the regular population (3,2% compared with 1,3%).

indian lands