

Forest definition and extent

*How much forest
is there in the world?
A surprisingly difficult
question to answer*

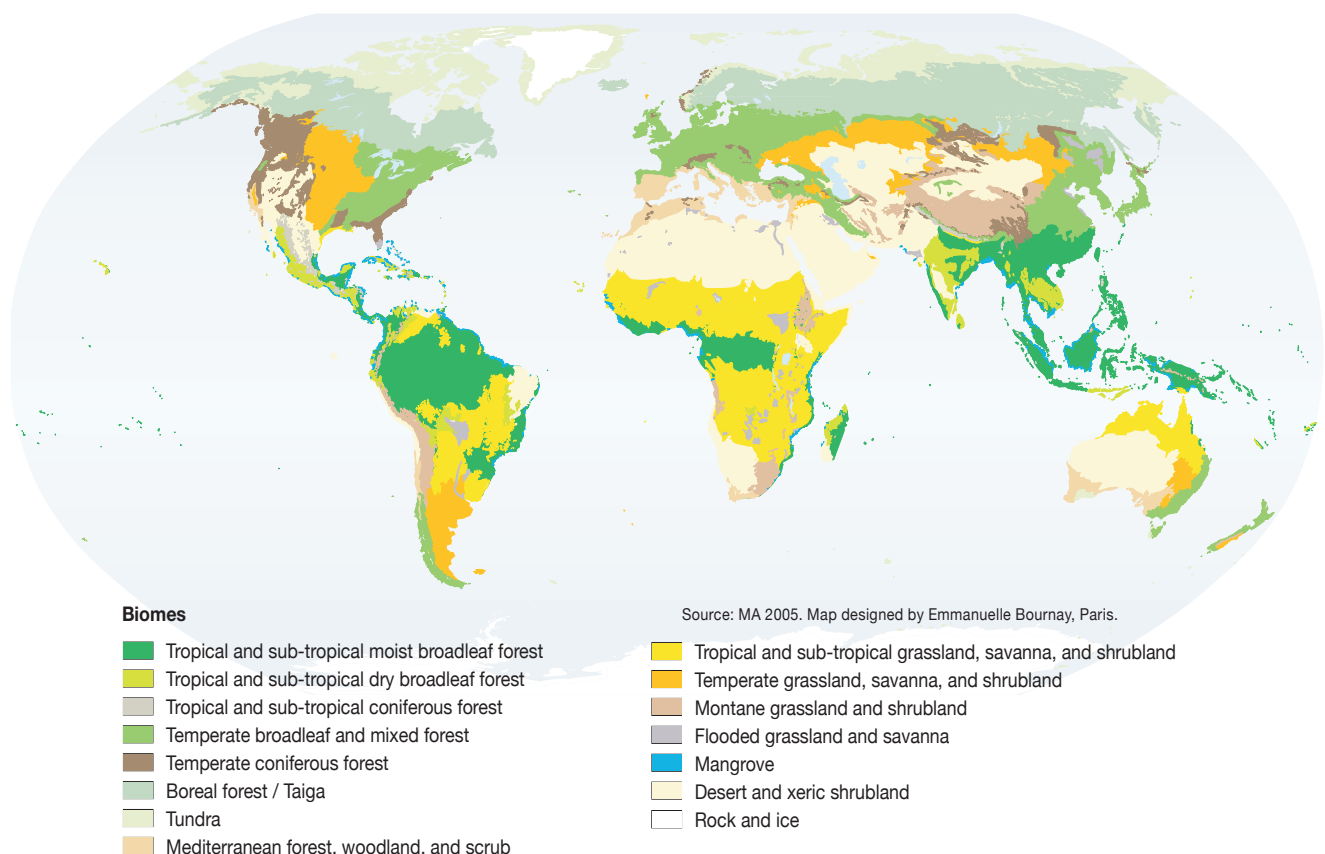
Defining what constitutes a forest is not easy. Forest types differ widely, determined by factors including latitude, temperature, rainfall patterns, soil composition and human activity. How a forest is defined also depends on who is doing the defining. People living in the British Isles or Scandinavia might identify forests differently from people in Africa or Asia. Similarly, a business person or economist might define and value a forest in a very different way from a forester, farmer or an ornithologist.

A recent study of the various definitions of forests (Lund 2008) found that

more than 800 different definitions for forests and wooded areas were in use around the world – with some countries adopting several such definitions at the same time!

It should be kept in mind that different definitions are required for different purposes and at different scales. An assessment focusing on the availability of timber for commercial or industrial purposes may exclude small wooded areas and types of forest not considered to be of commercial value. A definition based on physical characteristics, such as the canopy cover, will most likely be used for an assessment

↓ The main biomes of the world



→ Forest cover varies depending on how it is defined

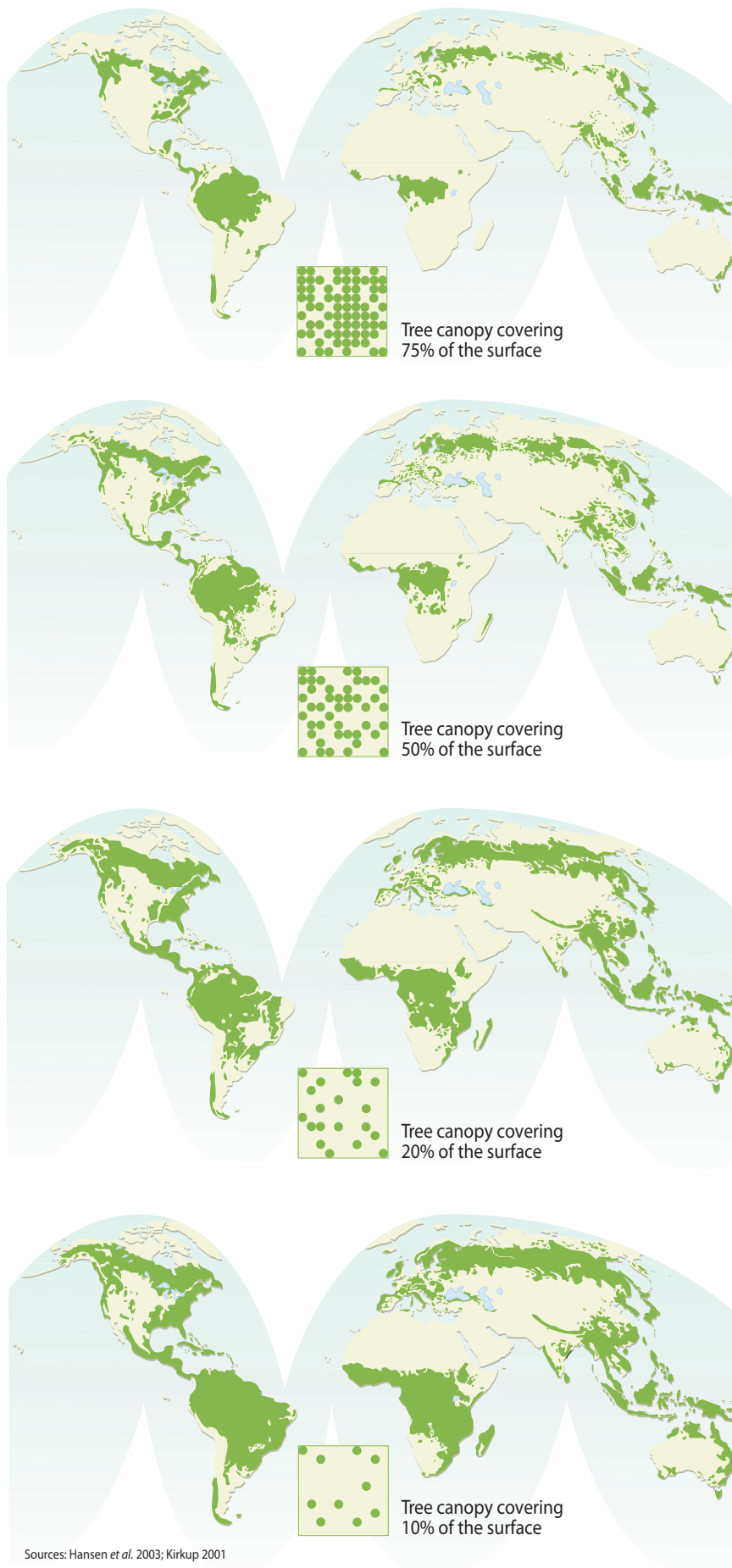
of the forest extent, whilst a definition based on botanical characteristics, i.e. variety of tree species, will be used for assessing various classes or types of forest. An overall assessment carried out on a regional or global level is unlikely to satisfy more detailed national level requirements. Conversely, a definition developed to suit the needs of any given country is unlikely to be applicable at a global level.

In an attempt to calculate how much forest there is both at regional and global levels some common definitions have been developed. These definitions are generally very broad, in order to encompass all types of forests – from dense, tall forests found in the humid tropics, to temperate and boreal forests and forests in semi-arid and arid regions.

Common Definitions

The Food and Agriculture Organization of the United Nations (FAO) has been assessing the world's forest resources at regular intervals. Its Global Forest Resources Assessments (FRA) are based on data provided by individual countries, using an agreed global definition of forest which includes a minimum threshold for the height of trees (5 m), at least 10 per cent crown cover (canopy density determined by estimating the area of ground shaded by the crown of the trees) and a minimum forest area size (0.5 hectares). Urban parks, orchards and other agricultural tree crops are excluded from this definition – as are agroforestry systems used for agriculture. According to this definition there are at present just under 4 billion hectares of forest in the world, covering in all about 30 per cent of the world's land area (FAO 2006a).

The United Nations Framework Convention on Climate Change (UNFCCC) uses a slightly different



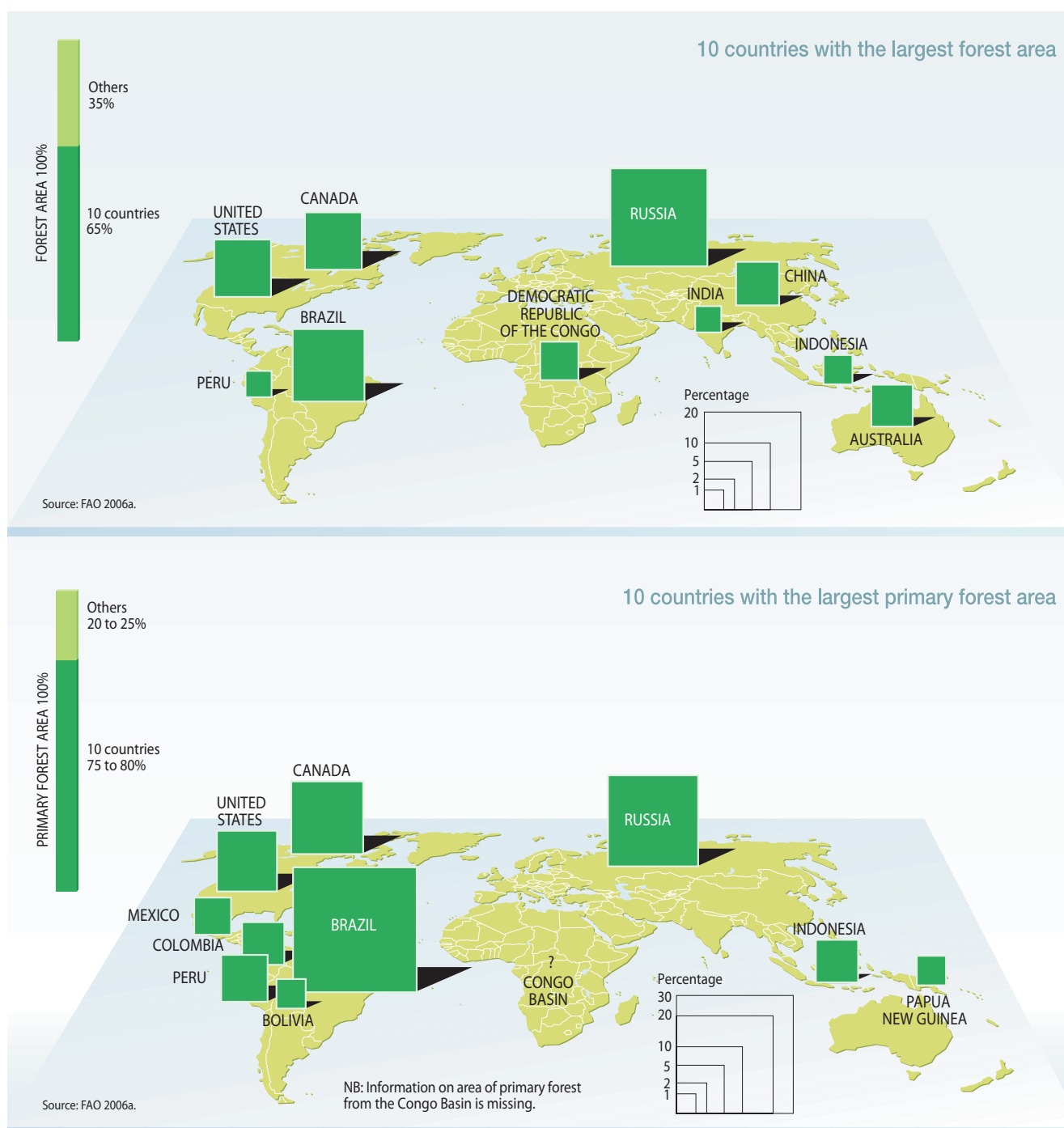
► approach. It requests industrialized countries to estimate the forest area according to their own national definitions which should be documented in the greenhouse gas inventory report. For supplementary reporting to the Kyoto Protocol, however, these countries have to apply a forest definition with threshold values within certain parameters; 0.01-1.0 hectares for minimum area, 2-5 meters for minimum

tree height and 10-30 per cent for minimum crown cover. The threshold values chosen must be used for all subsequent assessments made during the reporting period and if the definition is different from the definition used by FAO, the country should explain why a different definition was chosen.

The crown cover threshold and the land use criterion are, in most cases, the most critical factors defining for-

ests. The 10 per cent threshold of crown cover encompasses both open and closed forests. The term closed forest refers to areas where tree cover exceeds 40 per cent while the term open forest refers to areas where tree cover is between 10 and 40 per cent. In order to assess the state of the world's closed forests, the United Nations Environment Programme (UNEP) has recently employed other definition criteria,

↓ Countries with the most forest



including a minimum crown cover of 40 per cent. It has also used remote sensing to ensure compatibility across countries. According to the UNEP assessment, there were an estimated 2.87 billion hectares of closed forest worldwide in 1995, equivalent to 21.4 per cent of the total land area. Half of this area was located in Russia, Canada and Brazil (UNEP 2001).

Several other regional and global maps and assessments of forests have been produced – often with differing results, reflecting the various definitions and methodologies used and also the differing interpretations made.

Problems which arise in trying to assess the extent of forests worldwide are compounded by the fact that even when using a commonly held definition, data from one country is not

necessarily comparable with data from another due to the different methodologies used. For example, the use of satellite imagery might produce very different results to a ground based survey. In addition, remote sensing techniques for assessing forest areas can result in areas used for agricultural purposes or urban development being included rather than excluded in overall calculations of forest area.

In order to help address some of these problems, a new global remote sensing survey of forests carried out by group of agencies led by the FAO is at present being used to assess trends in forest areas over the last 30 years. The survey, which is due to announce its results in 2011, involves all countries and aims to carry out this work in as consistent a way as possible.

A factor not included in the above-mentioned definitions concerns just what a particular forest is made up of. Is it largely composed of indigenous (native) or introduced species? If planted, is it a monoculture – consisting of only one species? The definitions outlined above also exclude the condition of the forest. Is it an undisturbed primary forest, severely degraded forest or something in between? Is the forest healthy or has it been subject to attacks by pests, disease or forest fire, or damaged by wind or air pollution? Area is only one factor in assessing the world's forests: it is also vital to present comparable data on various specific forest types, examine forest health and look at usage and resource values.

→ See also pages 10, 40-46

Forest cover in percentage of total land area

