

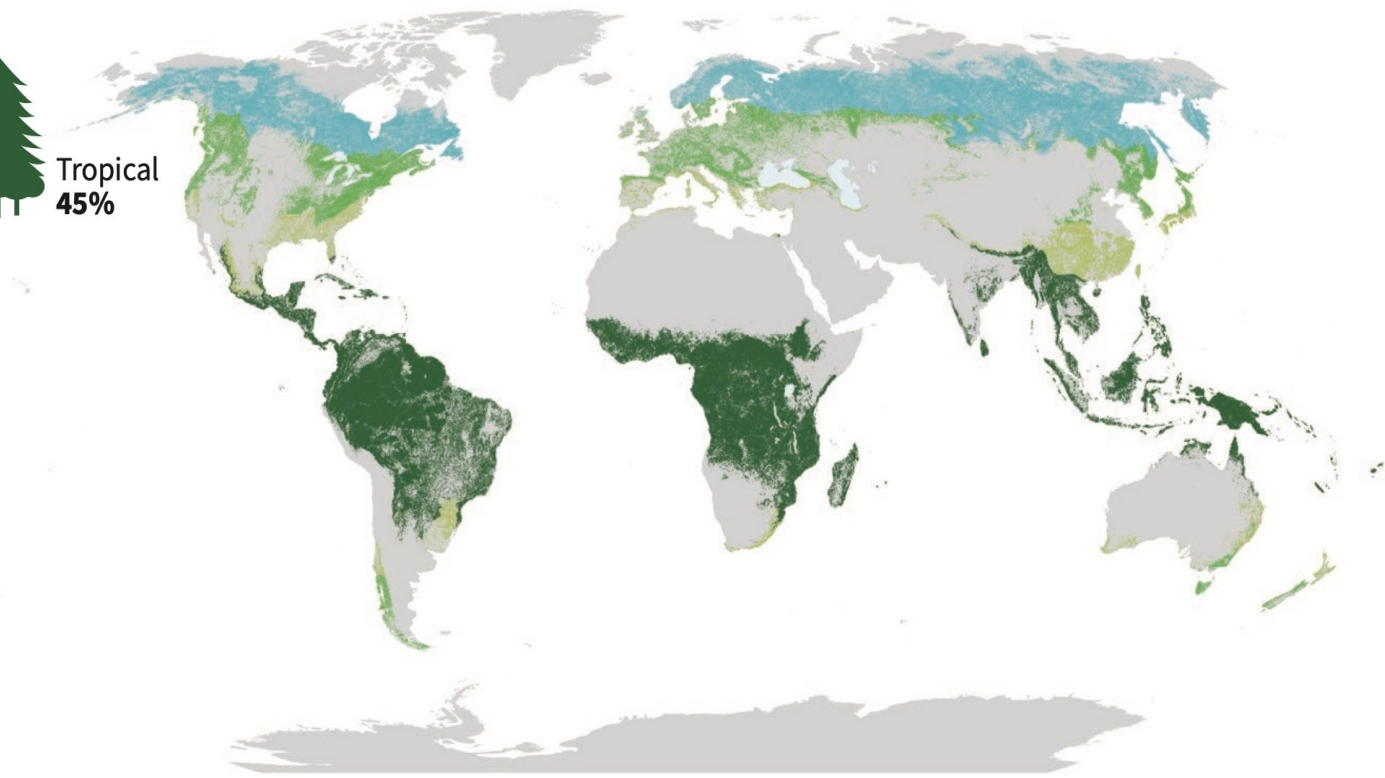
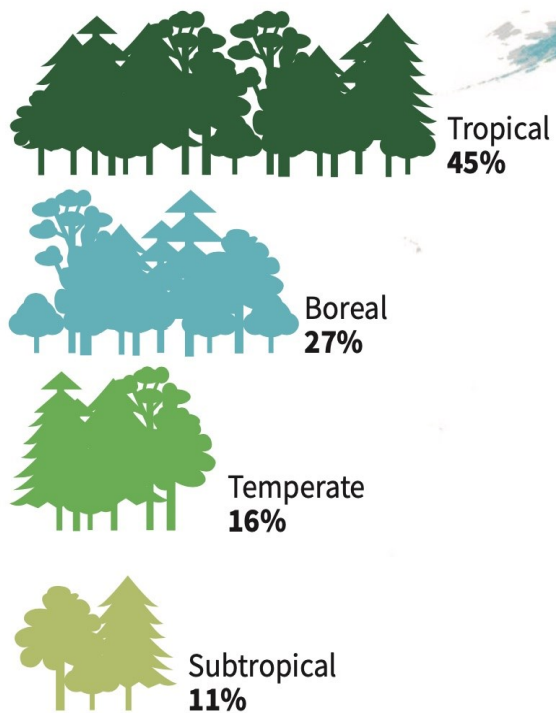
A FLORESTA E A VALORIZAÇÃO DO TERRITÓRIO NA NOVA ECONOMIA

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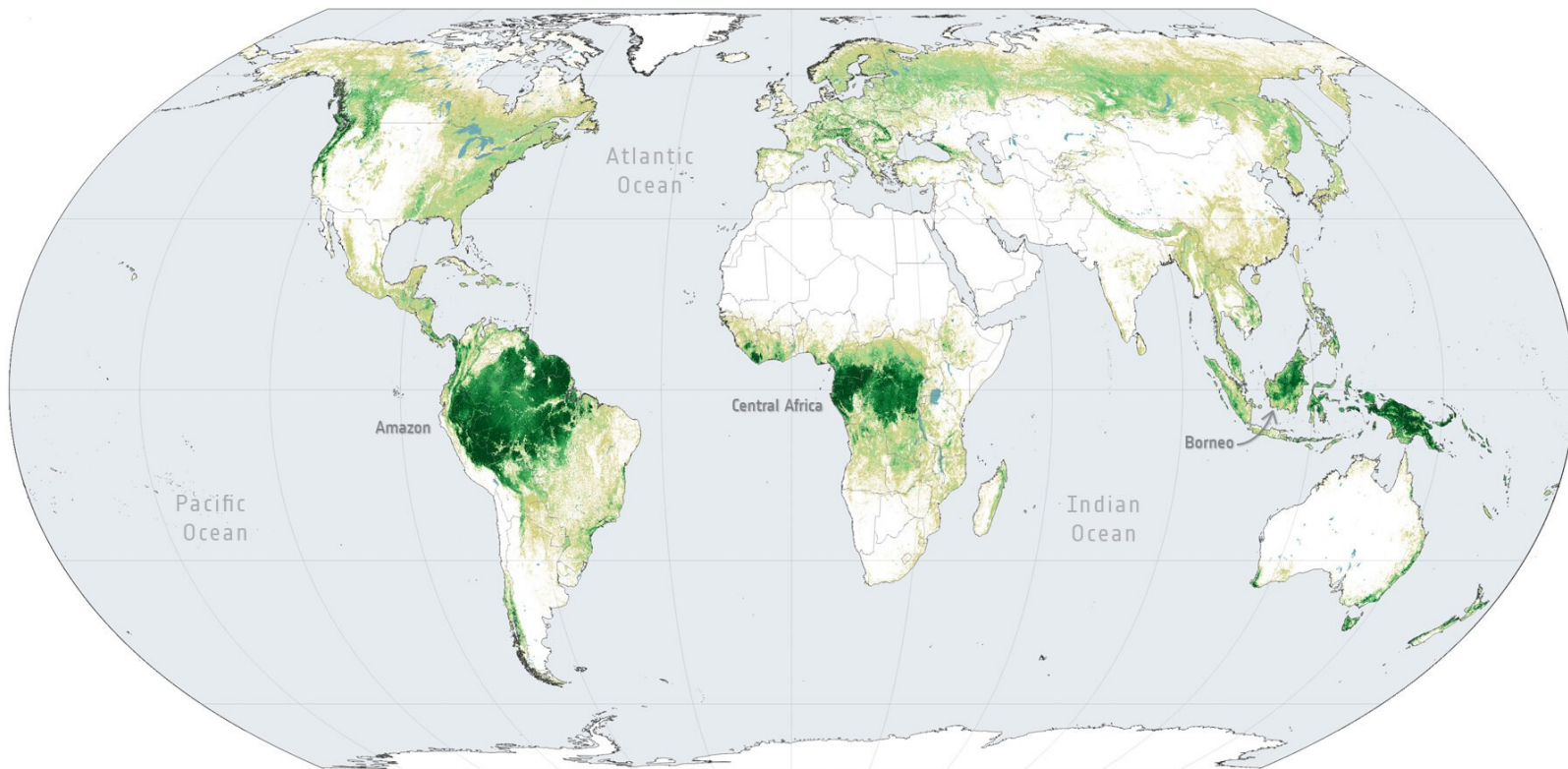


Proportion and distribution of global forest area by climatic domain, 2020



Source: Adapted from United Nations World map, 2020.

Top five countries for forest area, 2020 (million ha)

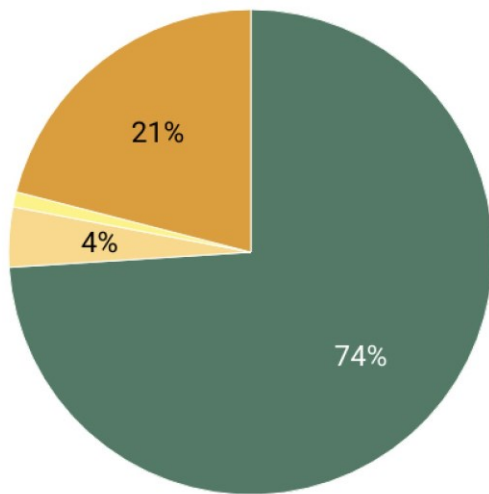


Above ground biomass, 2020

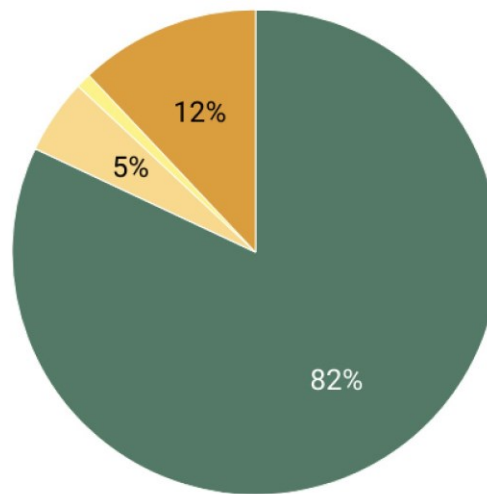


Distribution of forest types

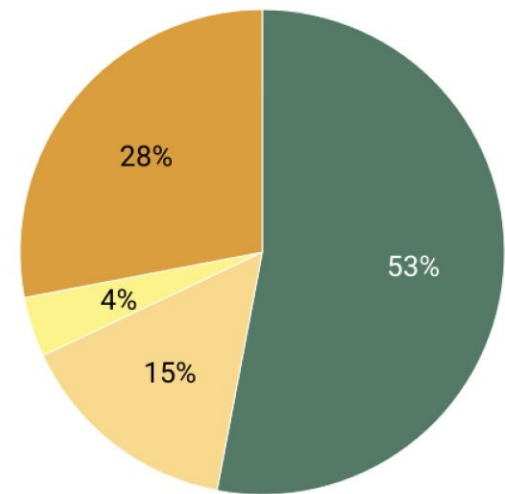
Old-growth forest Degraded forest Secondary forest Other cover types



Amazon

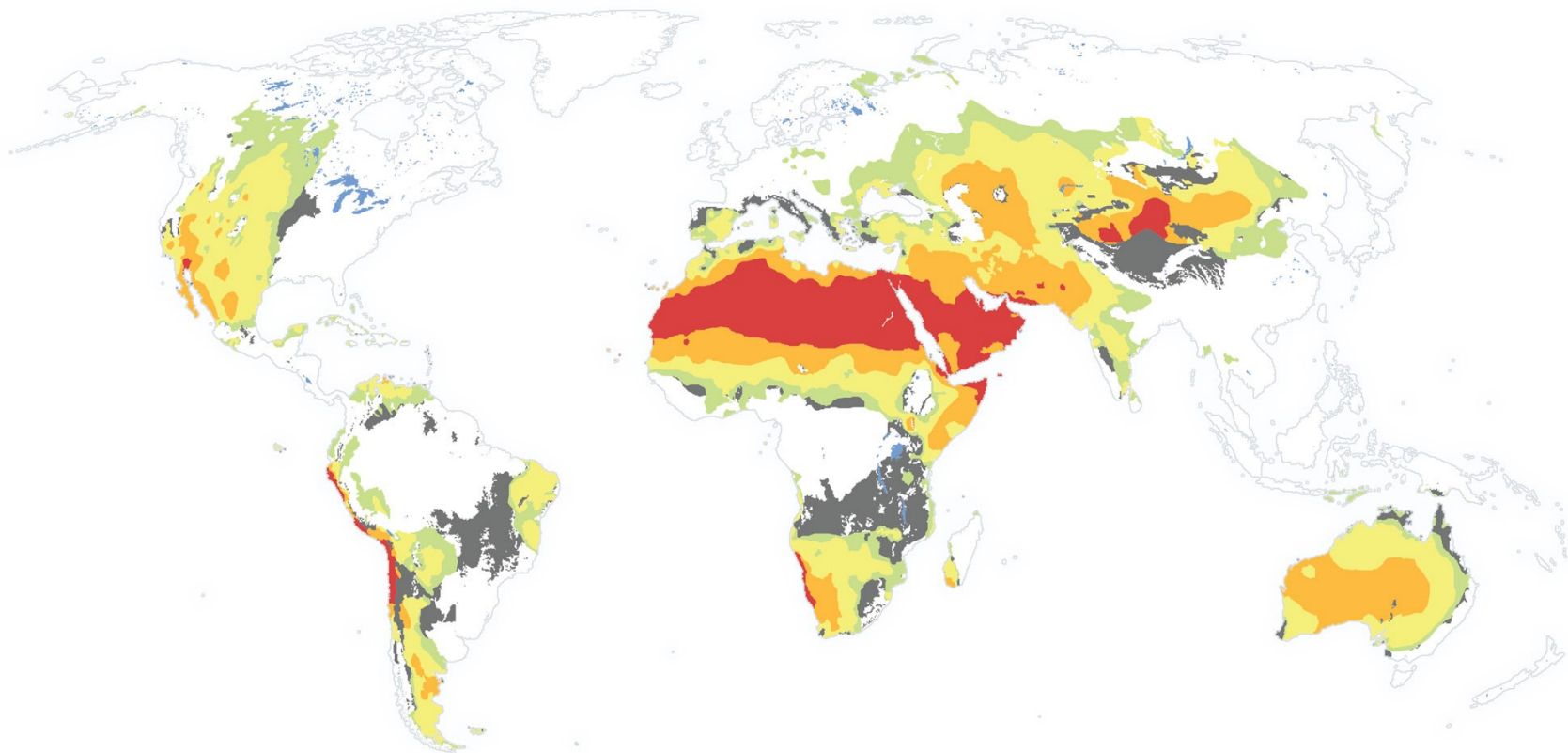


Central Africa



Borneo

Chart: ESA • Source: Dr Viola Heinrich, University of Bristol and University of Exeter, UK • Created with Datawrapper





Port-Cross National Park marine protected area.
© P. Le Nost



Posidonia grass meadows.
© P. Le Nost



High Atlas mountain range, Morocco.
© iStockphoto.com/C. Meurer



Cedar forest in the Al Shouf Cedar Nature Reserve, Lebanon.
© iStockphoto.com/F. Camhi

THE MEDITERRANEAN HOTSPOT: A VERY COMPLEX AND BIODIVERSITY RICH REGION

The Mediterranean is one of the most geologically, biologically, and culturally complex regions in the world and the only example of a large sea surrounded by three continents (Africa, Europe and Asia).

It is one of the 36 recognised biodiversity hotspots in the world, defined as bio-geographical regions that contain a high rate of endemic species, found nowhere else in the world, and where natural ecosystems have been seriously degraded, resulting in a sensitive area to biodiversity ⁴.

With a range of 2 million square kilometres the Mediterranean is the second largest of these biodiversity hotspots. This vast area is geographically diverse, with its extensive coastal areas, numerous archipelagos and islands, as well as flat and mountainous terrain ⁵. This geographical richness supports a variety of climates and more than 120 habitats, as defined by the International Union for Conservation of Nature (IUCN) Red List (RL) world classification in terrestrial, freshwater and marine biomes.



Olive trees in Patrimonio, Corsica.
© iStockphoto.com/S. Cesareo



Lake Prespa, Albania.
© J. Jalbert-TdV



The Gediz Delta, Turkey.
© Helia-Van Ingen

Figure 1.
Map of the Mediterranean basin with the biodiversity hotspot highlighted.





MEDITERRANEAN FORESTS

At least seven causes of the changes in the last three decades that have led to the current situation and that can provide clues for projecting the future of these forests:

- the direct effect of increased aridity due to more frequent and prolonged droughts, which has driven Mediterranean forest communities to the limit of their capacity to respond to drought and escape to wetter sites,
- the indirect effects of drought, mainly by the spread of pests and fires,
- the direct and indirect effects of anthropogenic activity associated with general environmental degradation, including soil degradation and the impacts of fire, species invasion and pollution,
- human pressure and intense management of water resources,
- agricultural land abandonment in the northern Mediterranean Basin without adequate management of new forests,
- very high pressure on forested areas of northern Africa coupled with the demographic enhancement, the expansion of crops and higher livestock pressure, and the more intense and overexploitation of water resources uses on the remaining forested areas,
- scarcity and inequality of human management and policies, depending on the national and/or regional governments and agencies, being unable to counteract the previous changes.

FLORESTA PORTUGUESA

▶ Valor social, ambiental e económico relevante

▶ 70% do país; 14% da população portuguesa em zonas rurais

▶ Cerca de 13% das emissões de CO₂. Contribui para a regularização dos regimes hídricos e biodiversidade, e gera, anualmente, um valor equivalente a ~4,5MM€ para a economia nacional

▶ Planos Regionais de Ordenamento Florestal aprovados (previstos desde 1996), a par de outras iniciativas destinadas a agregação do minifúndio. Há um vasto conjunto de ações por concretizar, desde logo o consenso entre os vários *stakeholders* no que diz respeito aos desafios atuais e à ambição de longo prazo

▶ Escassa valorização do recurso florestal nas últimas décadas. O desafio tem três dimensões principais : diminuição da área arborizada (-3% entre 1990 e 2020), a sua produtividade, e um elevado custo de oportunidade que pode significar a perda de 3 a 4MM€ do valor da Floresta até 2050

DESAFIOS QUE IMPORTA RESOLVER PARA VALORIZAR A FLORESTA

1. O atual valor económico do recurso é limitado e incompatível com o risco associado, que elimina a criação de valor (com exceção para o eucalipto e pinheiro-manso);
2. A floresta é desproporcionadamente privada (98%) e desagregada (5 ha em média em algumas zonas do país), e tem um nível de certificação/ profissionalização abaixo de países comparáveis (~10% vs. >50% na UE);
3. Falta de cadastro, com apenas 18% de área vulnerável cadastrada (Norte do Tejo), associada a um panorama sucessório complexo, onde, em média, 30% dos prédios rústicos fazem parte de heranças indivisas;
4. O mercado tem uma cadeia de valor com dinâmicas competitivas desequilibradas, com elevada fragmentação ao nível da produção, que desfavorece a profissionalização de pequenos produtores e contribui para um reduzido nível de agregação em associações (apenas 4%);
5. A pouca informação limita a transparência de mercado e penaliza a gestão ativa e valorização do recurso florestal;
6. Os processos de fiscalização e regulação são ausentes ou ineficazes, perpetuando a situação atual;
7. A complexidade da governança pública do sector e a falta de integração na gestão de fileiras dificultam criação de uma visão comum;
8. O envelhecimento das populações rurais e o êxodo de competências/capacidade de gestão nesta área tornam o panorama futuro sombrio.

FUNÇÕES DA FLORESTA

As florestas são um dos ecossistemas terrestres com maior biodiversidade

Funções socioeconómicas

A floresta proporciona emprego, rendimento e matérias-primas para a indústria e a energia renovável

Funções ambientais

- ▷ Protegem o solo
- ▷ Conservam a biodiversidade
- ▷ Regulam as reservas de água doce
- ▷ Regulam o clima
- ▷ Sumidouros e fonte de carbono
- ▷ Regularizadoras das condições meteorológicas regionais e locais



We are part of nature, not separate from it. We rely on Nature to provide us with food, water and shelter; regulate our climate and diseases; maintain nutrient cycles and oxygen production; and provide us with spiritual fulfilment and opportunities for recreation and recuperation, which can enhance our health and well-being. We also use the planet as a sink for our waste products, such as carbon dioxide, plastics and other forms of waste, including pollution.

The Economics of Biodiversity: The Dasgupta Review (2021)

SERVIÇOS DOS ECOSSISTEMAS

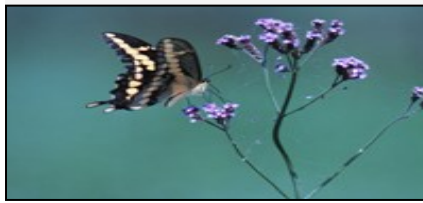
Aprovisionamento

Bens ou produtos produzidos pelos ecossistemas



Regulação

Processos naturais regulados pelos ecossistemas



Culturais

Benefícios não materiais obtidos dos ecossistemas



Suporte

Funções dos ecossistemas que mantêm todos os serviços



Nature contributions to people (IPBES)

- 1 Habitat & Biodiversity Conservation
- 2 Pollination and Seed Dispersal
- 3 Air Quality Regulation
- 4 Climate Regulation
- 5 Regulation of the Chemical Composition of the Oceans
- 6 Regulation of Water Quantity and Flow
- 7 Regulation of Water Quality
- 8 Soil Formation and Protection
- 9 Regulation of extreme events
- 10 Pest and Disease Control
- 11 Energy
- 12 Food and Nutrition
- 13 Materials and Fibers
- 14 Medicine
- 15 Learning and Inspiration
- 16 Nature Experiences
- 17 Identity, Heritage, and Legacy



GLOBAL TRENDS IN THE CAPACITY OF NATURE TO CONTRIBUTE TO GOOD QUALITY OF LIFE FROM 1970 TO THE PRESENT



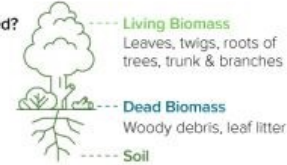
Carbon Storage in Earth's Ecosystems

Achieving net-zero by 2050 depends on the Earth's natural carbon sinks.

Forests play a critical role in regulating the global climate. They absorb carbon from the atmosphere and then store it, acting as natural carbon sinks.

Where is Carbon Stored?

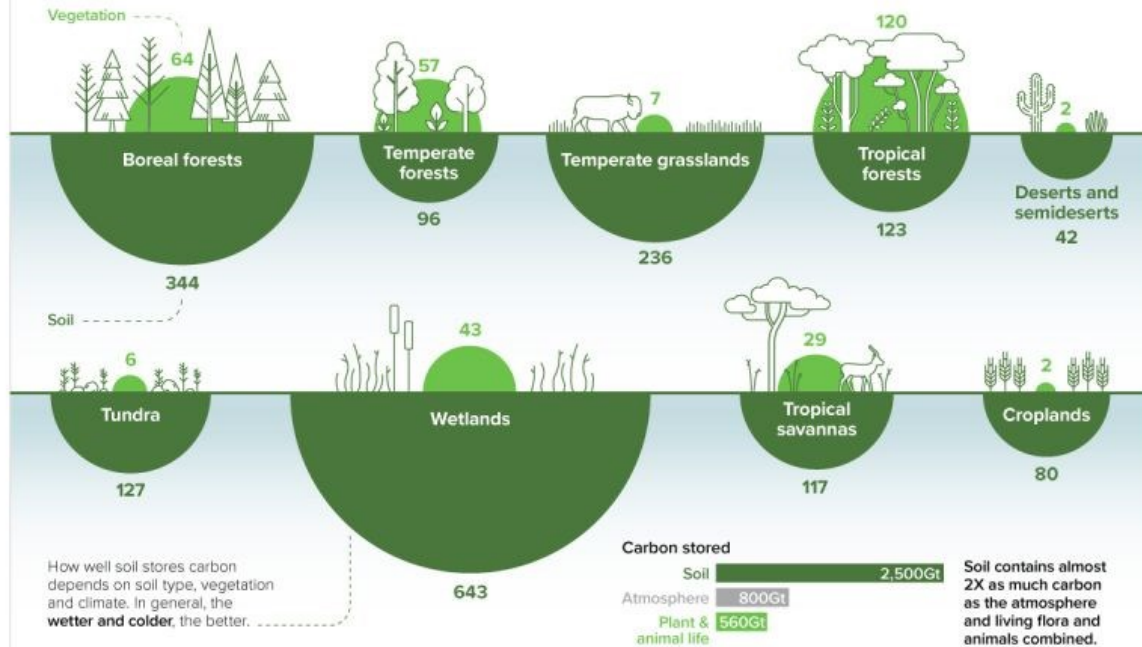
There are various carbon pools in a forest ecosystem.



Carbon Storage Tonnes of Carbon per Hectare*

The world's forests absorb around **15.6 gigatonnes** of CO₂ each year. That's around 3X the annual CO₂ emissions of the United States.

However, around **8.1 gigatonnes of CO₂** leaks back into the atmosphere due to deforestation, fires and other disturbances.

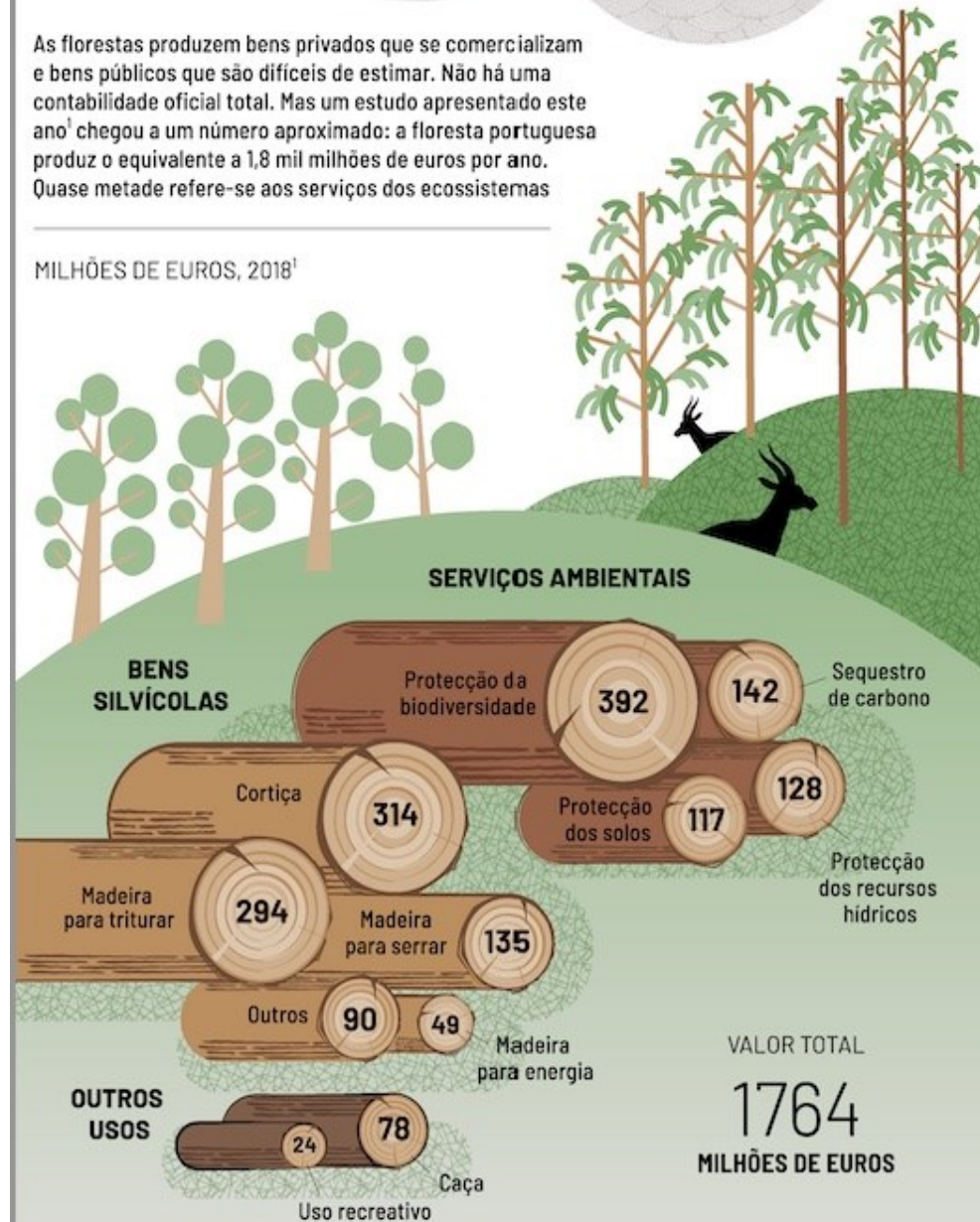


*At a ground depth of one meter.
Sources: IPCC; NASA

QUANTO VALE A FLORESTA

As florestas produzem bens privados que se comercializam e bens públicos que são difíceis de estimar. Não há uma contabilidade oficial total. Mas um estudo apresentado este ano¹ chegou a um número aproximado: a floresta portuguesa produz o equivalente a 1,8 mil milhões de euros por ano. Quase metade refere-se aos serviços dos ecossistemas

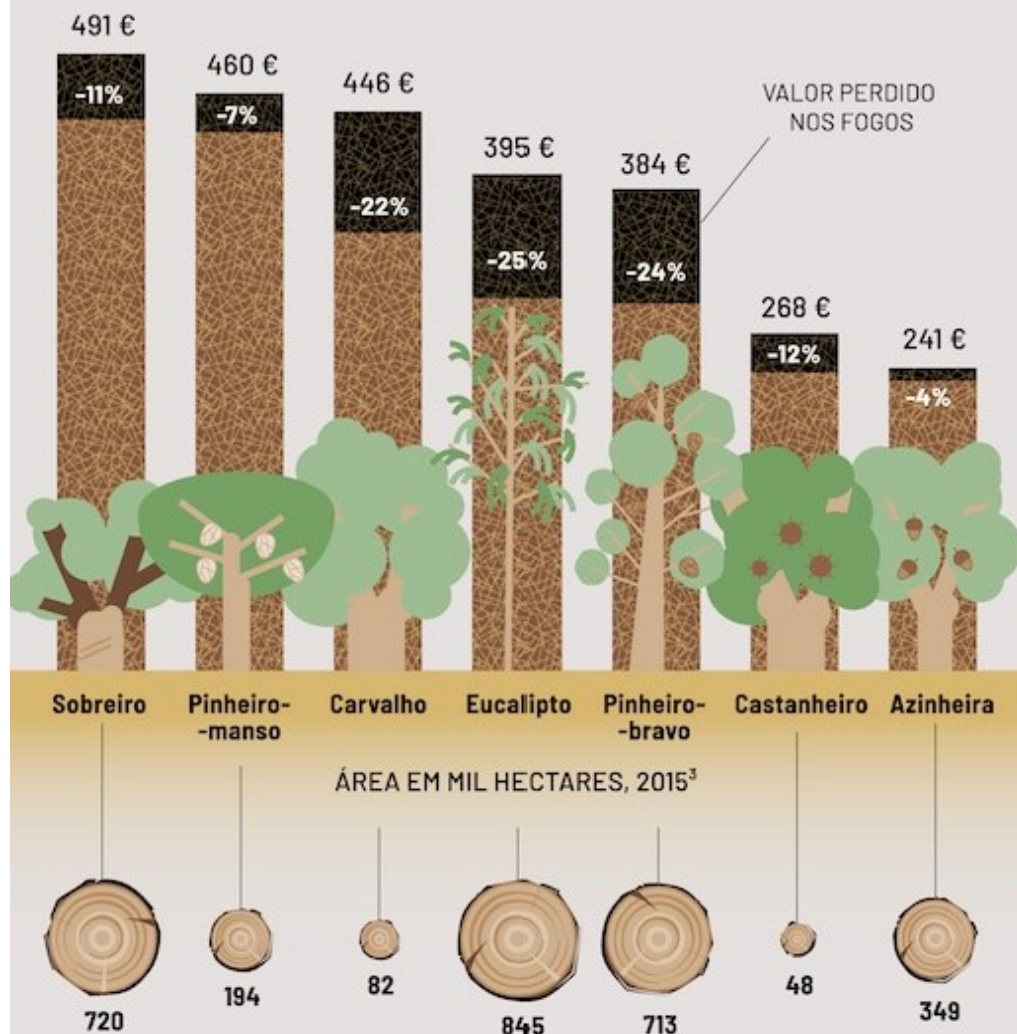
MILHÕES DE EUROS, 2018¹



E POR TIPO DE ÁRVORE?

Um estudo anterior², de 2014, produziu cálculos semelhantes, mas para cada tipo de espécie florestal, levando também em conta os serviços ambientais. Os resultados apontam o sobreiro como a espécie mais valiosa e mostram que os fogos reduzem em um quarto o valor dos pinhais e eucaliptais

EUROS POR HECTARE POR ANO, 2014



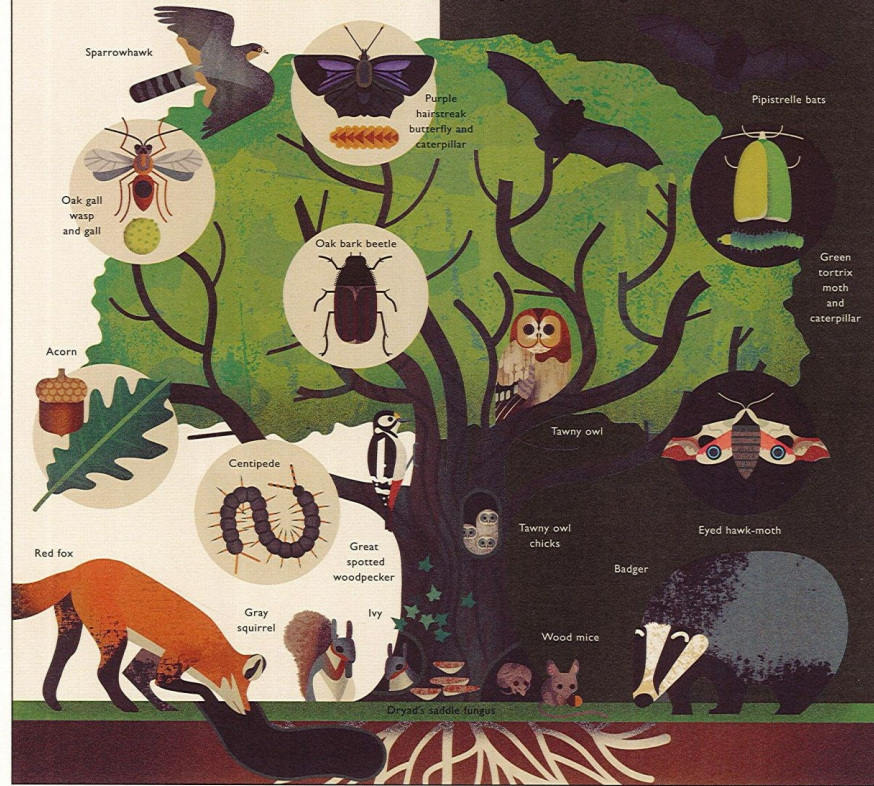


WHO'S IN THE TREE?



IN GENERAL, THE OLDER A TREE, THE MORE LIFE IT SUPPORTS. This ancient oak may have lived for nearly 600 years, and within its spreading branches, it provides food and shelter for many types of creatures. In spring, its young leaves are food for insect larvae—one tree could provide food for hundreds of thousands of caterpillars alone, while in autumn its acorns are eaten

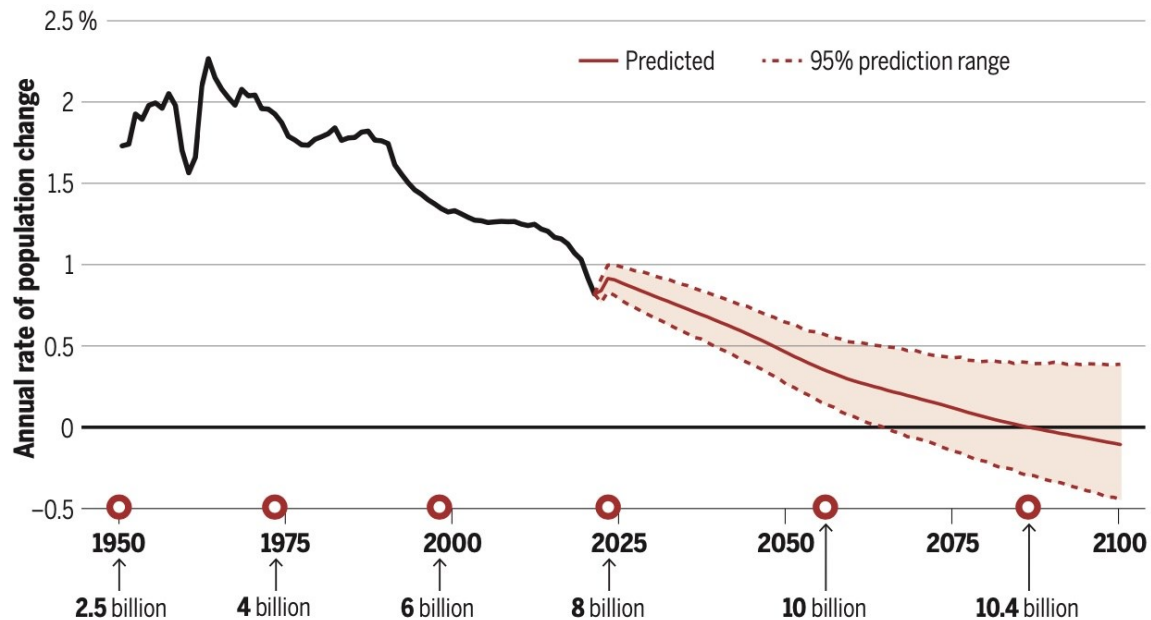
by insects, birds, and small mammals. All year round, creatures burrow beneath its bark, nest among its branches, or thrive in the deep litter made by its falling leaves. And when night falls a new cast of characters emerges—owls, bats, badgers, and mice—who have sheltered among its roots or in hollows within its trunk during the hours of daylight.

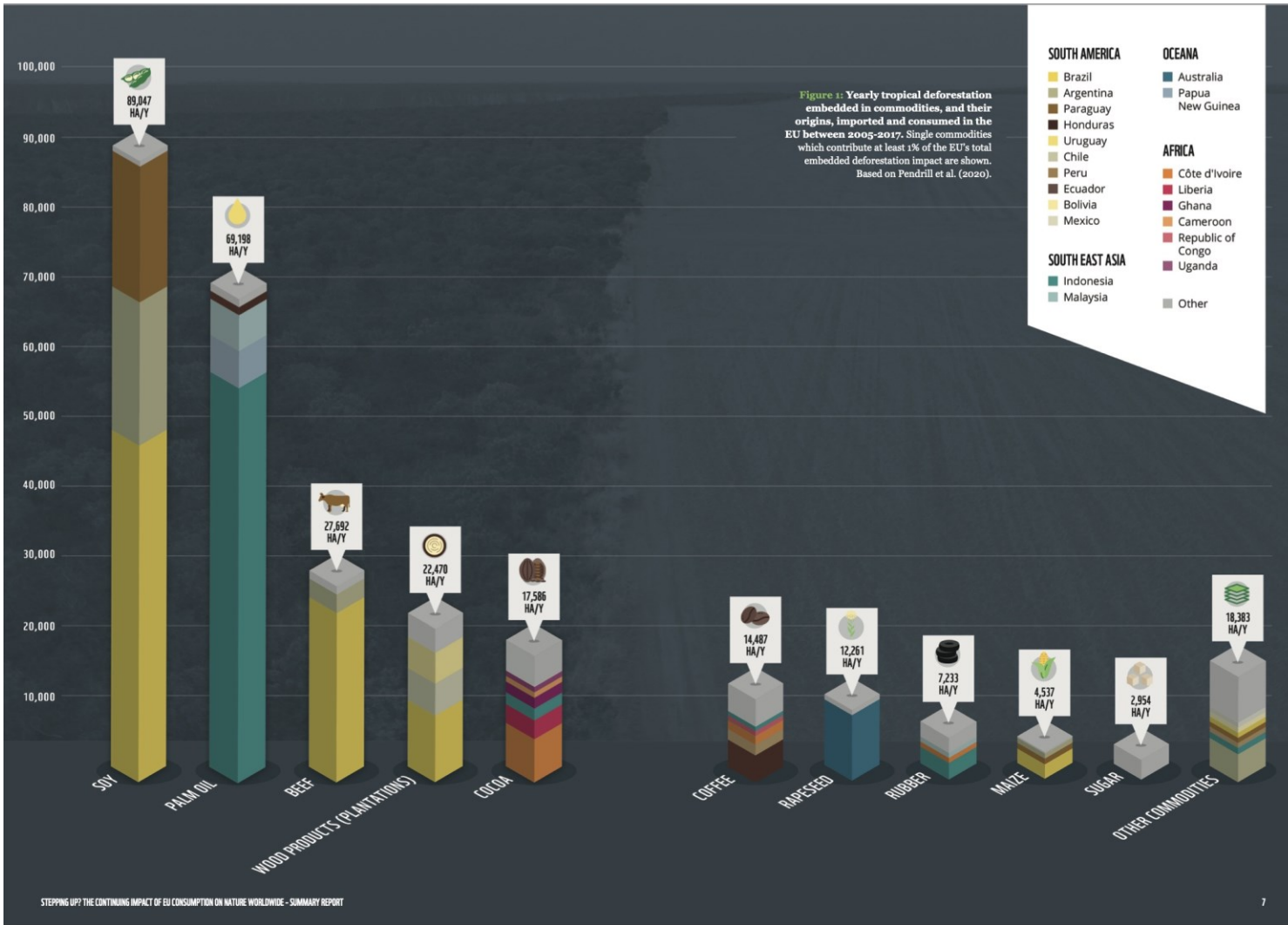


DEMOGRAPHY

World population hits 8 billion as growth slows

Earth's population has reached a milestone by surpassing 8 billion people, the United Nations said this week. But the rate of increase is falling, and global population may begin to decline late in the century after topping out at about 10.4 billion, according to the U.N. Population Division. Its *World Population Prospects 2022* report notes that two-thirds of the global population already lives in a country or area where lifetime fertility is below 2.1 births per woman, roughly the level required for zero growth for a population with low mortality. More than half of the projected increase in global population between now and 2050 will be concentrated in just eight countries: the Democratic Republic of the Congo, Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines, and Tanzania.





Fonte: Stepping up? The continuing impact of EU consumption on nature worldwide WWF 2021

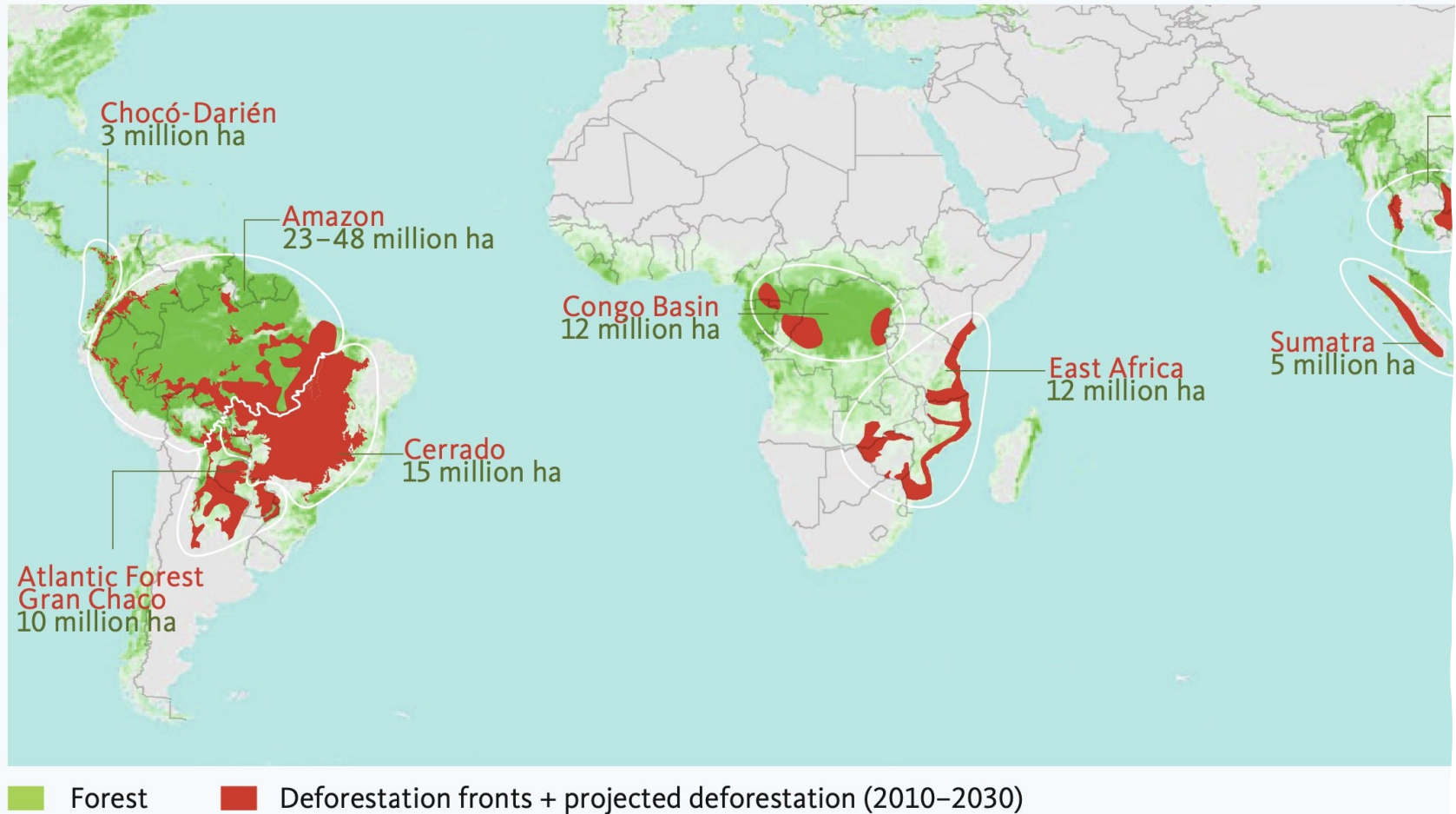
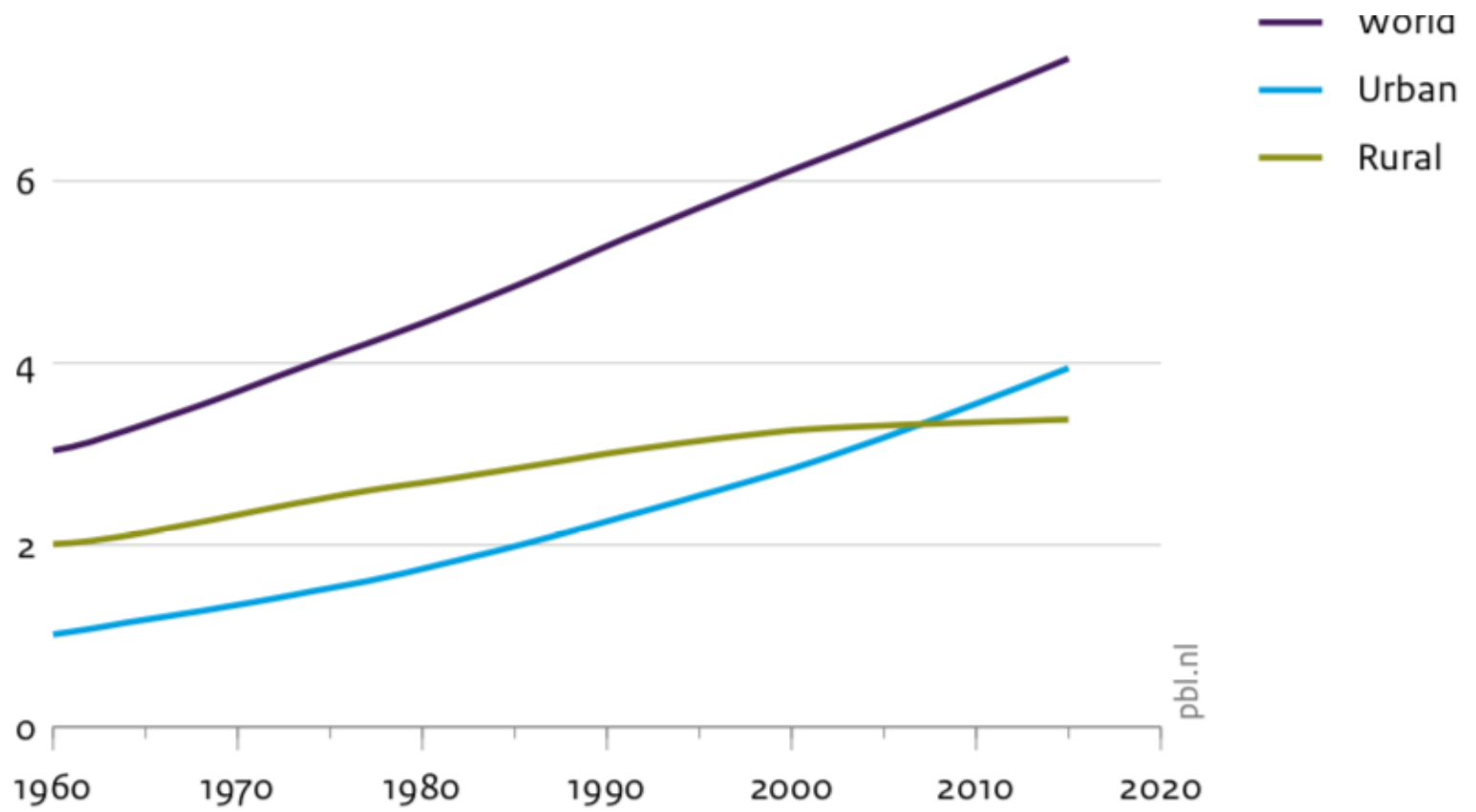


Figure 2.1-4

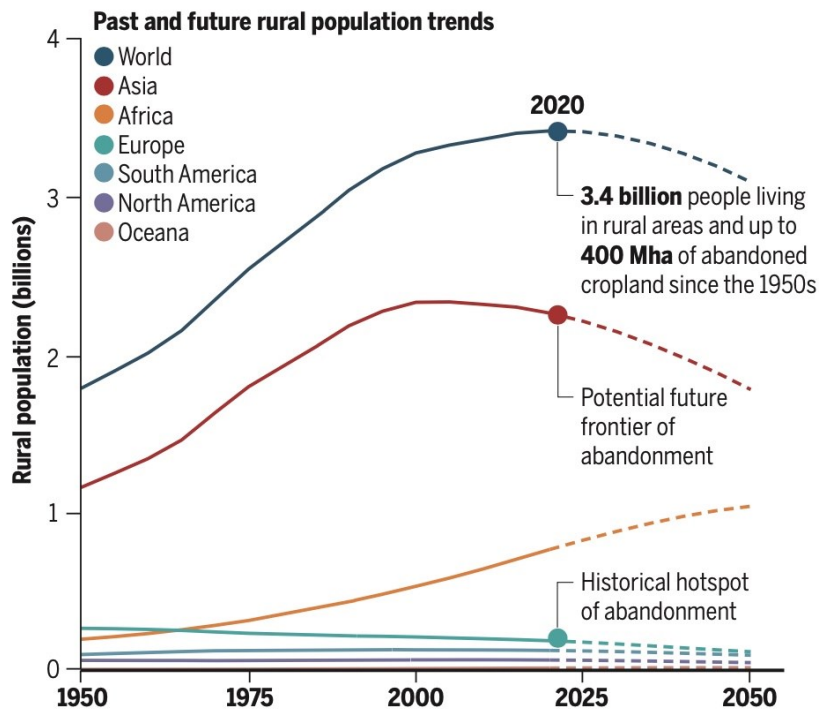
Expected hotspots of global deforestation up to 2030.

Source: IPBES, 2018a:285; ©Text and graphics: 2015 WWF



Abandonment leads to heterogeneous biodiversity trajectories

Land abandonment is increasing as rural populations decrease. Rural population trends over time and projections for the future (dashed lines) are based on United Nations Population Division statistics. Abandonment is driven by a range of factors, and it influences biodiversity in heterogeneous ways, which have implications for ecology and conservation.



DRIVERS OF ABANDONMENT

- Rural depopulation
- Environmental degradation
- War and conflict
- Natural hazards
- Rapid socioeconomic and political change

ABANDONMENT

Factors that influence the effects of abandonment on biodiversity

Abiotic

- Soil properties
- Fire regime
- Climate and climate change
- Land-use legacy effects
- Other drivers of global change

Biotic

- Species traits
- Resilience to change
- Adaptive capacity
- Multitrophic interactions
- Invasive species

HETEROGENEOUS BIODIVERSITY CHANGE

IMPLICATIONS FOR ECOLOGY AND CONSERVATION

Biodiversity change on abandoned land should be included in regional and global assessments, policies, and scenarios.

The reuse of abandoned land should balance economic needs with restoration and conservation goals.

The management of abandoned land should take a socioecological perspective and consider connections between people and nature.

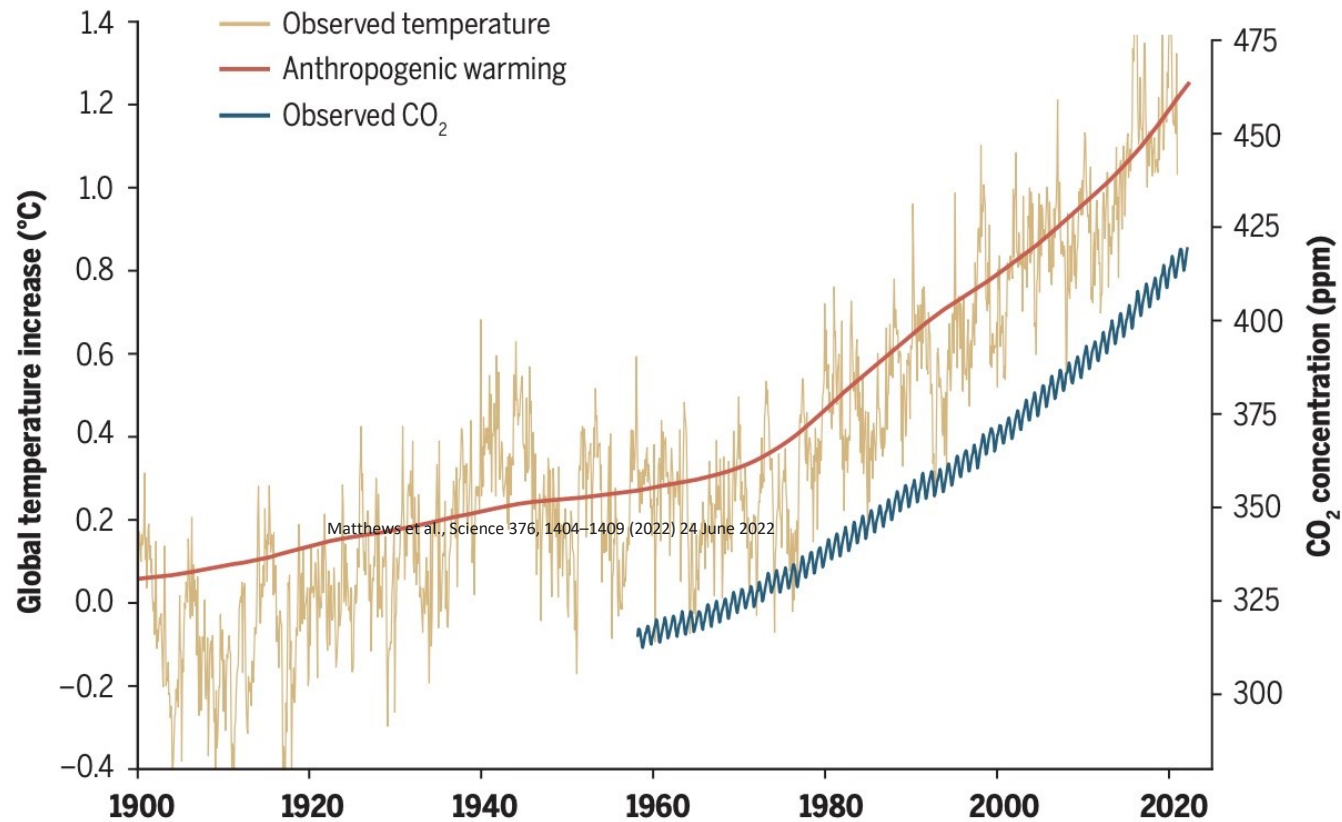


Fig. 1. Global temperature and atmospheric CO₂ change. Observed global temperature has increased by >1.2°C since the 1850 to 1900 baseline period (thin beige line; monthly temperature observations). Virtually all of this increase can be attributed to anthropogenic drivers (red line). The observed atmospheric CO₂ increase (blue line) is the primary driver of anthropogenic global warming.

Regional Climate Variability

Even though climate change is a global issue, its impacts are experienced differently across the world. This means that responses are often specific to local contexts, and people in different regions are adapting in different ways. In Europe, expected impacts will vary regionally, in terms of intensity, duration, frequency and location.



Key projected impacts and effects on sectors for the main biogeographic regions of Europe. Source: EEA

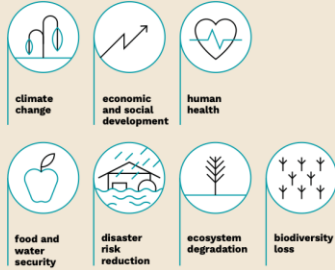
Table 2.12. Effects of climate change on the Mediterranean forest vegetation

Observed effects	Cause	Consequences
Changes in forest plants' growth and health	Increased CO ₂ concentrations	<ul style="list-style-type: none"> • Increased productivity of some species • Increased biomass production of some species: greater number of leaves, higher total leaf area per plant, larger diameter stems and branches • Reduction of growth and health of local vegetation
Changes in vegetation patterns and distribution	Drought, rainfall and extreme weather events	<ul style="list-style-type: none"> • Influences plant productivity and efficiency of water use • Influences seed production • Habitat and coverage losses • Loss of biodiversity • Forest distribution shifting northward and upward
Changes in plants' phenology	Decreased precipitation and increased average winter temperature	<ul style="list-style-type: none"> • Decrease in winter chilling requirements for flowering and seed germination • Advancement of flowering date • Increase in the length of growing season • Incomplete winter hardening • Reduction in winter cold/snow damages
Changes in wildfires	Increased dry and warm conditions	<ul style="list-style-type: none"> • Increased frequency of fire events • Increased forest fire intensity and length • Replacement of forest with fire-prone shrub communities • High risk for native species to fail seed regeneration • High risk of increased invasion by non-native species
Pest outbreaks	Increased winter temperatures and extreme temperature episodes	<ul style="list-style-type: none"> • Increased frequency and intensity of pest outbreaks • Pest location and range shifts poleward or to higher altitudes

What are Nature-based Solutions (NbS)?

NbS are defined by IUCN as "actions to **address societal challenges** through the protection, sustainable management and restoration of ecosystems, benefiting both biodiversity and human well-being." They use the power of nature and functioning ecosystems as infrastructure to provide natural services to benefit society and the environment.

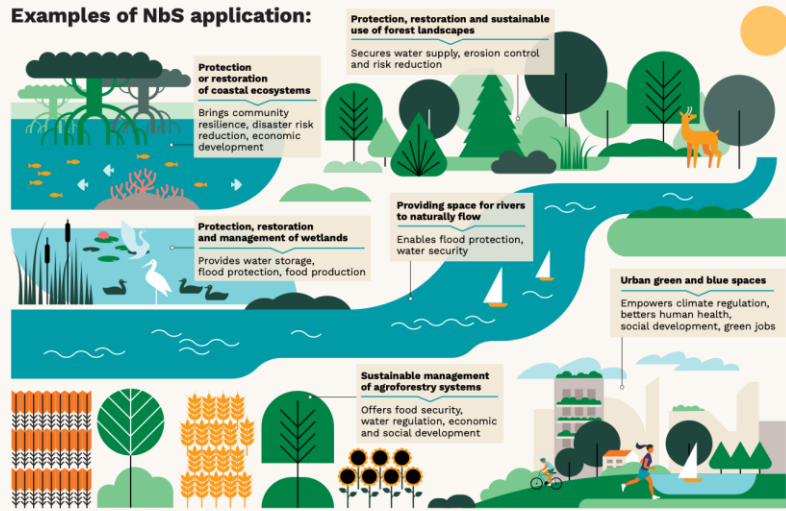
NbS have prime potential to help address global challenges such as:



NbS can provide long-term environmental, societal and economic benefits:



Examples of NbS application:



www.iucn.org/adapt

[@theadaptproject](https://www.facebook.com/theadaptproject)



Soluções baseadas na natureza

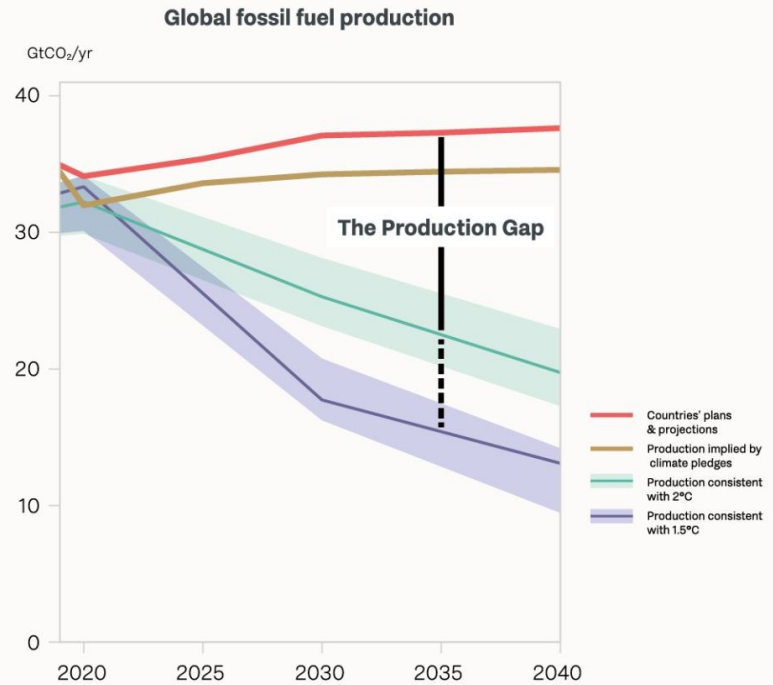
As soluções baseadas na natureza (SbN) trazem benefícios ambientais, sociais e económicos, de longo prazo:



- **PRINCÍPIOS**

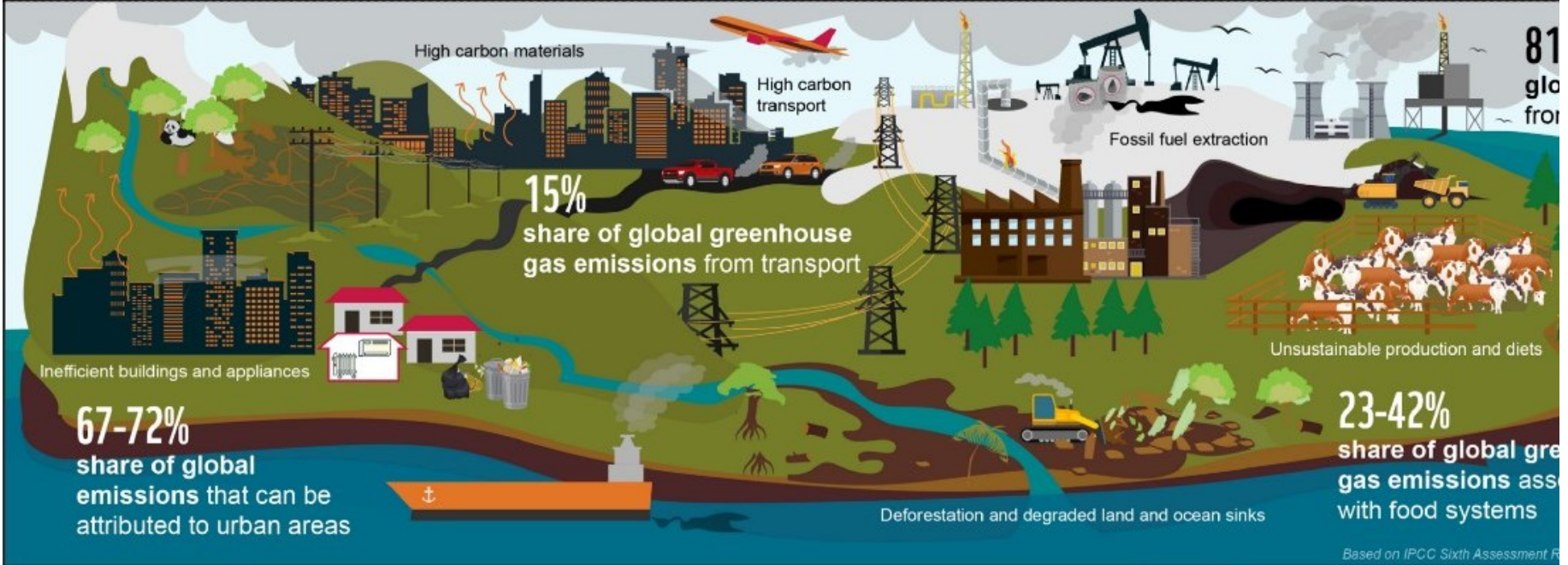
- - As soluções baseadas na natureza não são uma alternativa à descarbonização;
- - As soluções baseadas na natureza devem envolver um amplo conjunto de ecossistemas;
- - As soluções baseadas na natureza devem ser planeadas em parceria com as comunidades locais, respeitando os seus direitos;
- - As soluções baseadas na natureza devem apoiar a biodiversidade - da genética ao ecossistema.

World's governments must take immediate steps to close the fossil fuel production gap.



MITIGATION OF CLIMATE CHANGE

A human intervention to reduce emissions or enhance the sinks of greenhouse gases



INDUSTRY	ENERGY	TRANSPORT	BUILDINGS	AGRICULTURE	ECOSYSTEMS	SYSTEMS TRANSFORMATION	
<p>Circular material flows</p> <p>Innovation & electrification</p>	<p>Phase-out fossil fuels</p> <p>Renewable energy</p> <p>Demand management / energy efficiency</p>	<p>Greener public transport, cycling, walking</p> <p>Electrification</p>	<p>Energy efficient homes and appliances</p> <p>Green buildings</p>	<p>Reduce methane from livestock</p> <p>Enhance carbon in agricultural soils & agroforestry</p>	<p>Nature-based solutions</p> <p>Ecosystems such as forests, wetlands, grasslands</p> <p>and blue-carbon protected, managed and restored</p>	<p>Strengthening climate policies</p> <p>Scale up climate finance</p> <p>Improve governance and institutions</p> <p>Equity and just transition</p>	<p>Parks and trees</p> <p>Energy infrastructure</p> <p>Low-footprint lifestyles</p>

State of Mediterranean Forests

Table 3.5. Examples of measures to enhance the mitigation capacity of Mediterranean forests

Carbon pool	Mitigation measures
Living biomass	<ul style="list-style-type: none">• Land reforms• Promote afforestation (bearing in mind future climate conditions)• Identify and combat causes of forest degradation and deforestation• Reinforce the role of fire prevention in wildfire management• Monitor pests and diseases• Promote forest regeneration and a balanced age/class distribution• Promote good practices in wood/cork/other product extraction to limit damage to trees and the proliferation of pests and diseases
Soil and Litter	<ul style="list-style-type: none">• Avoid tillage wherever possible and/or reduce tillage intensity• Combat overgrazing by domestic and/or wild animals• Promote full and permanent soil coverage• Promote soil productivity and accumulation of organic soil matter

Nature-positive activities and resilience building should be at the centre of a sustainable economy

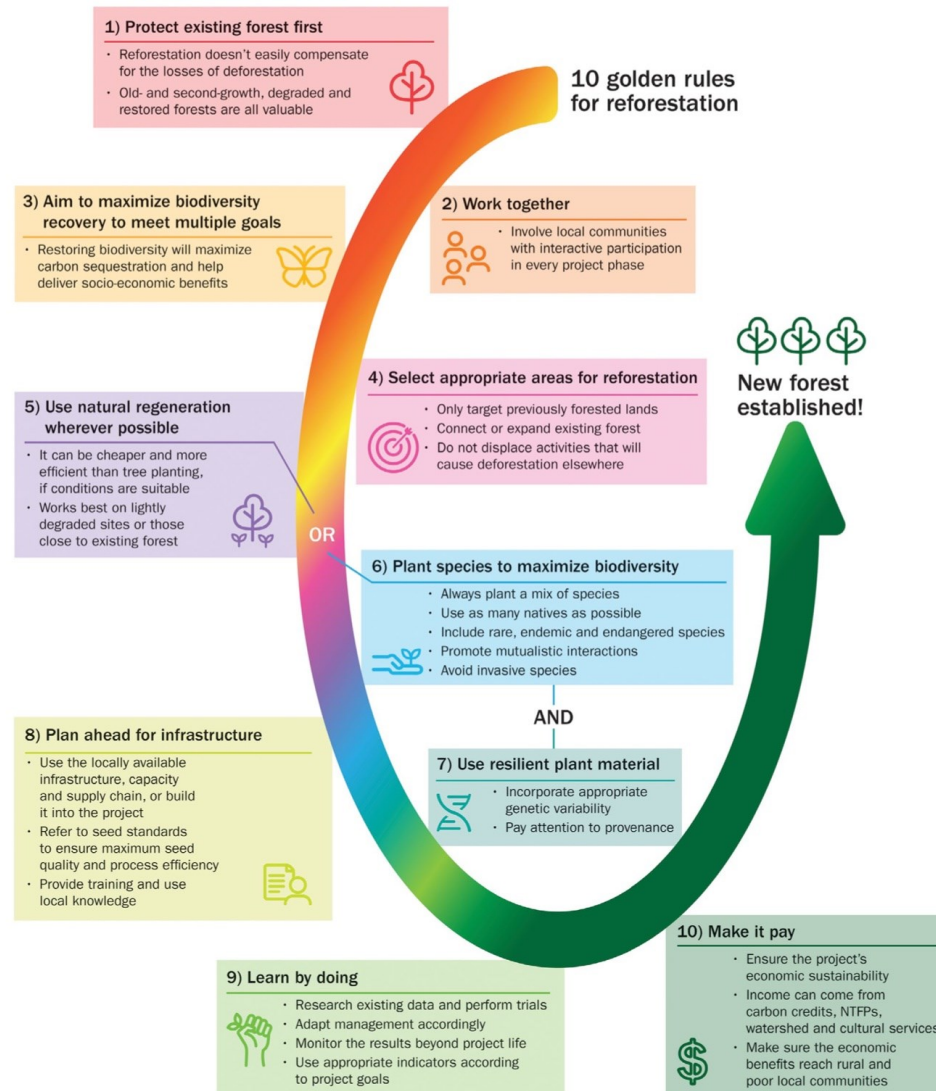
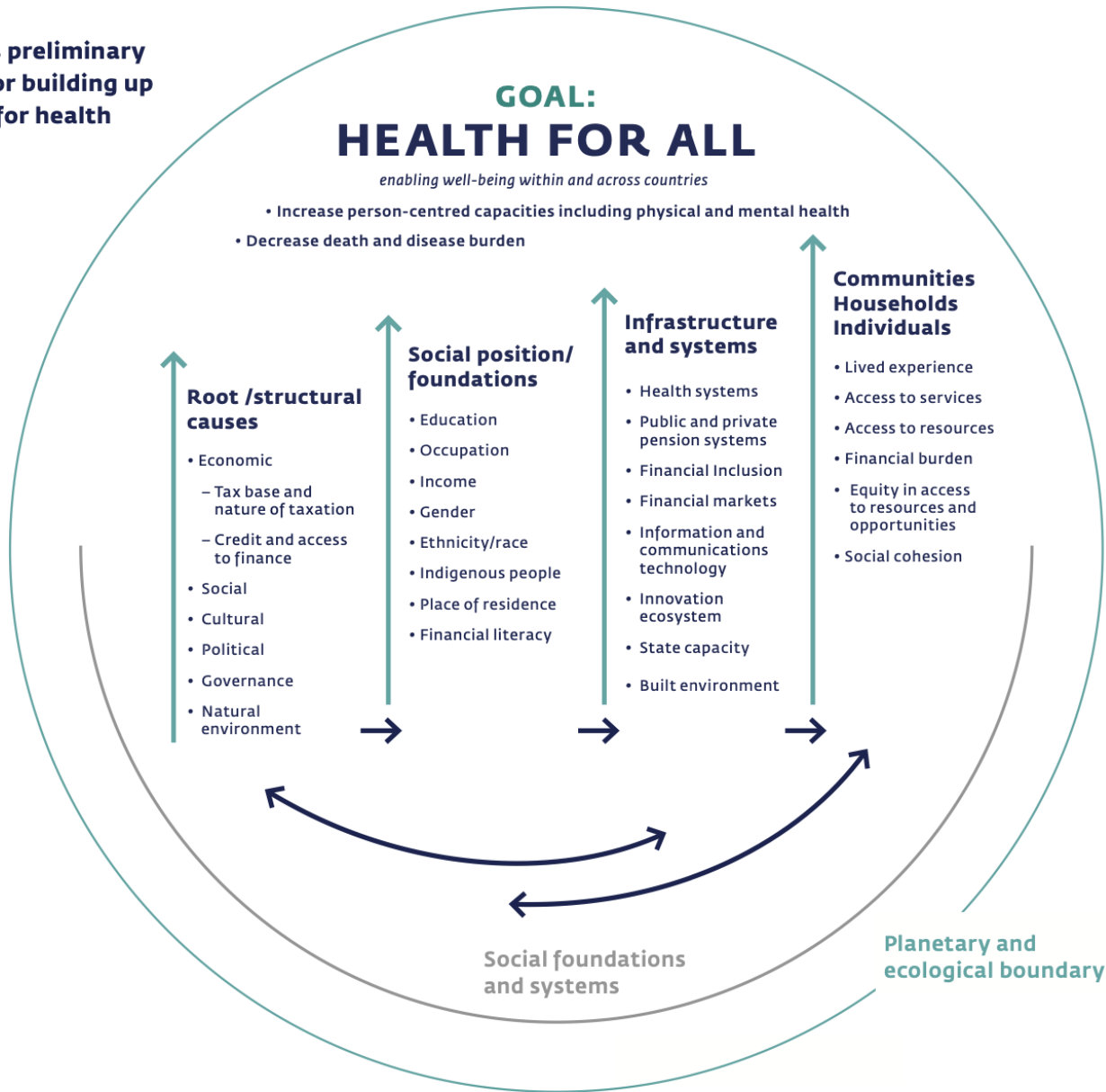


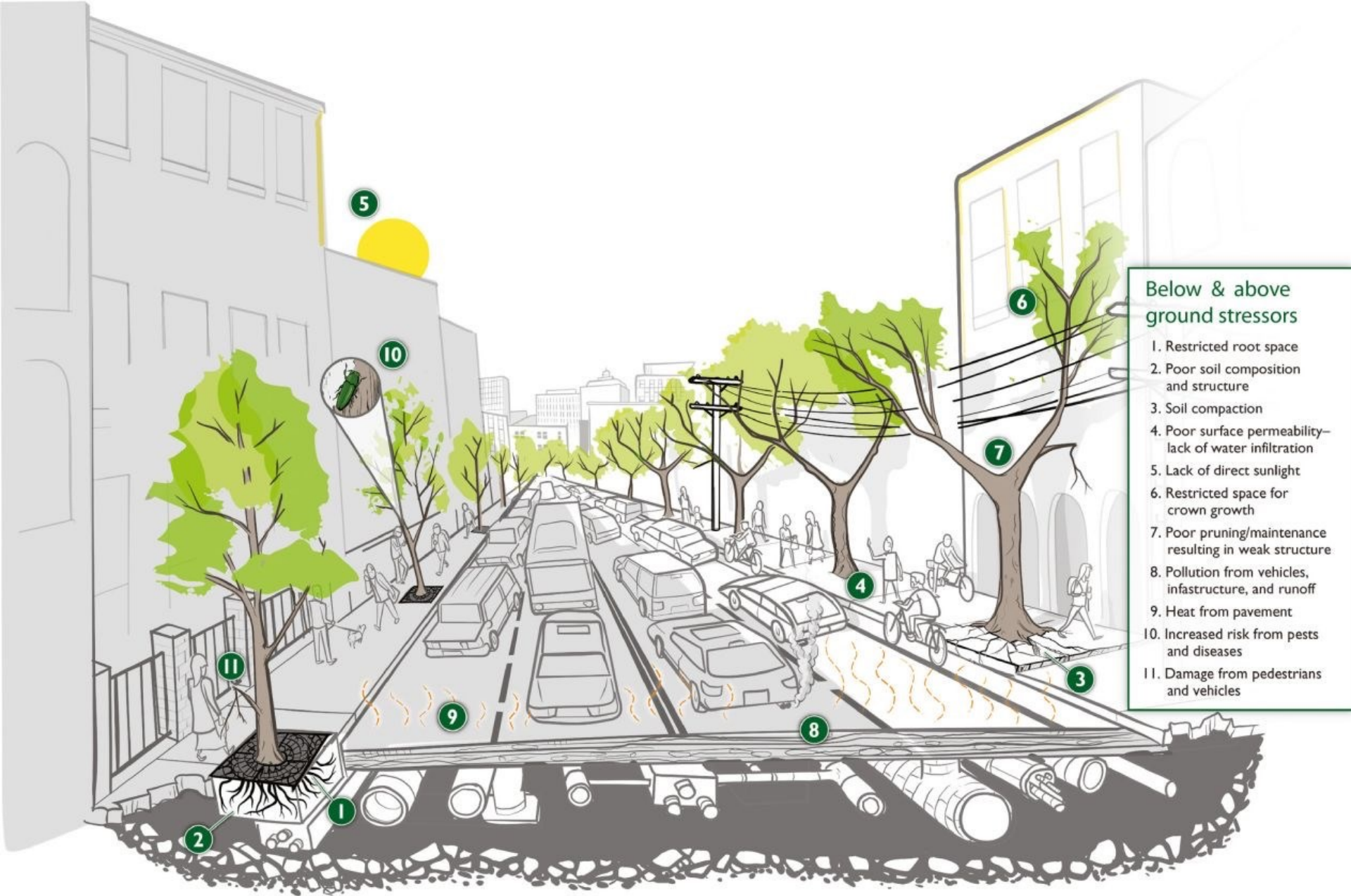
FIGURE 2 Ten golden rules for a successful reforestation project. The order of the rules matches the order in which tasks should be considered during project planning and implementation, although some are interdependent and should be considered in parallel. See text for details

The Council's preliminary framework for building up an economy for health





"I love nature."



- ### Below & above ground stressors
1. Restricted root space
 2. Poor soil composition and structure
 3. Soil compaction
 4. Poor surface permeability—lack of water infiltration
 5. Lack of direct sunlight
 6. Restricted space for crown growth
 7. Poor pruning/maintenance resulting in weak structure
 8. Pollution from vehicles, infrastructure, and runoff
 9. Heat from pavement
 10. Increased risk from pests and diseases
 11. Damage from pedestrians and vehicles

