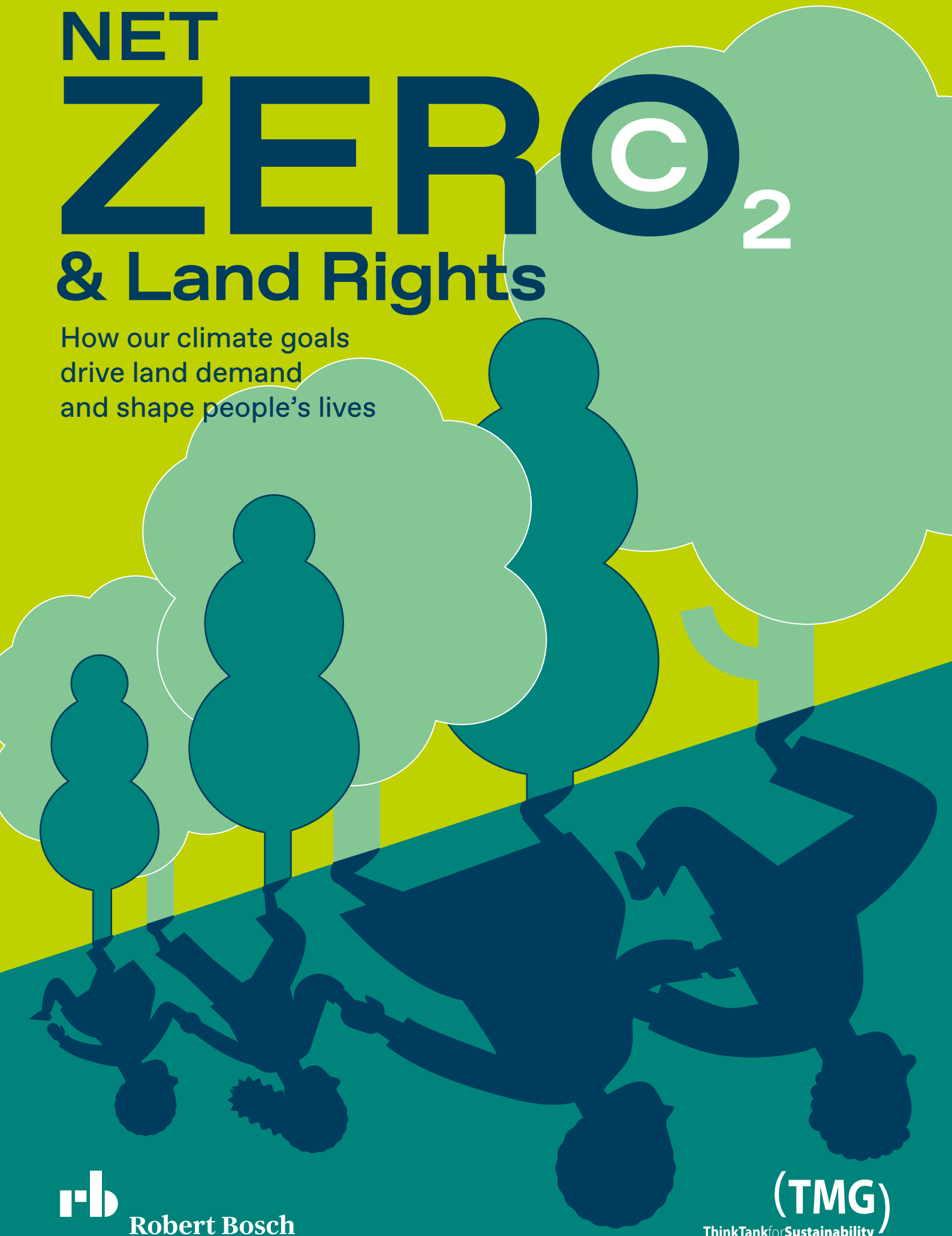
NET ZERO CO_2 & Land Rights

How our climate goals drive land demand and shape people's lives



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Foreword

The increased occurrence of deadly heat waves and flooding led United Nations Secretary General António Guterres to declare that we are witnessing "a climate breakdown in real-time". Climate extremes disproportionately impact those without access to resources to adapt. Addressing this injustice must be a central focus of climate policy.

Global efforts to reduce emissions must accelerate urgently to prevent further human suffering caused by climate change. However, the Intergovernmental Panel on Climate Change (IPCC) projects that limiting global warming to 1.5°C will not only require emission reduction but also measures to remove carbon dioxide. Carbon dioxide removal refers to the process of withdrawing carbon dioxide that has already been or will be emitted into the atmosphere.

Several strategies for carbon dioxide removal exist. To date, afforestation and reforestation are among the most commonly used approaches–sometimes at the expense of other vital ecosystems, such as grasslands.

Meanwhile, reports of escalating deforestation in the world's remaining tropical forests and the widespread occurrence of catastrophic forest fires are well documented. This raises an important question: what could possibly be wrong with planting more trees?

Trees must often be planted in areas that are currently not forested. However, this land is usually inhabited by Indigenous Peoples and local communities. Establishing new forests necessitates changes in how the land is used, which can have significant consequences for people who depend on it for agriculture. Such land use change often results in livelihood loss for these communities.

Climate justice demands that measures to achieve global climate goals do not harm people who are already living in vulnerable situations. Therefore, carbon dioxide removal projects that hurt smallholder farmers or pastoralists are everything but climate just.

Carbon markets add an important layer of complexity to carbon dioxide removal. At the 29th meeting of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP29) in Baku, Parties finalised Article 6 of the Paris Agreement, establishing rules for carbon markets. Carbon markets aim to deliver cost-efficient climate mitigation by trading carbon credits, each representing one tonne of carbon dioxide equivalent (CO_2e), between emitters and those reducing or avoiding emissions through reforestation, afforestation, or renewable energy projects.

Net Zero and Land Rights takes a deep dive into one specific aspect of carbon markets: investments in land-based carbon projects. These projects have long been a component of rapidly growing voluntary carbon markets even prior to the agreement at COP29. They serve as a testing ground for the further design and implementation of carbon market mechanisms.

Such land-based carbon projects are subject to severe criticism: studies reveal that carbon credits often fail to deliver the promised climate change mitigation outcomes. Further, carbon markets allow high emitters to buy their way towards carbon neutrality without transforming their economies or business models. Land-based carbon projects have

also led to severe social implications. Indigenous Peoples are evicted from their traditional territories in the name of conservation. Additionally, carbon markets can exacerbate existing gender disparities in land access. Carbon market intermediaries tend to address the male head of household as the landowner, who may then make land use decisions that affect female household members without their involvement. In effect, women lose their land use rights, which harms household food security. Land-based carbon projects also further increase land's value, contributing to the rush for land. In effect, Indigenous Peoples, women and youth run the risk of being pushed off of their land.

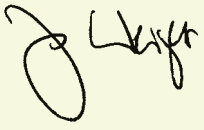
We believe such criticism merits further analysis. Governments around the globe are eager to implement land-based carbon projects, despite an absence of effective regulation. Carbon credits are seen as a way to earn much-needed foreign currency for developing countries. As a result, carbon markets are both here to stay and projected to grow. This necessitates an urgent need to find ways to regulate land-based carbon projects so that they benefit local communities and Indigenous Peoples instead of harming them.

Large-scale land-based carbon projects are implemented in rural areas that are often defined by weak land rights, poor law enforcement and the absence of democratic land use planning processes. At the same time, parties to the UNFCCC have already adopted binding human rights agreements that acknowledge land as a key element of substantive human rights, such as the Right to Food and the Right to Housing. Carbon markets do not operate in a void; the framework for their operation must be defined by human rights. Given the pace with which land-based carbon projects are implemented, it is key to urgently operationalise human rights agreements to regulate carbon markets.

This publication presents a breadth of evidence that demonstrates why a human rights-based framework is integral to regulating carbon markets at the national level. Such a framework would include measures to recognise and protect legitimate land tenure rights to ensure participatory planning and decision-making processes, as well as empower local communities and Indigenous Peoples so that they can benefit from carbon markets. Effective grievance mechanisms are another key element of a human rights-based framework for carbon markets.

This publication moreover aspires to contribute to a broader debate on land-based carbon projects. Many national climate commitments are based on land use in other countries. In the absence of a human rights-based framework for carbon markets, these national climate commitments can increase the vulnerability of people who are already most affected by the impact of climate change. Tropical forests and ecosystems are crucial carbon sinks and heralded as possessing great potential for land-based carbon sequestration. That is why this publication focuses on the Global South and the African continent in particular. It is complemented by an online resource that provides further insights into the topic.

We would like to wholeheartedly thank the authors of the articles that contributed to Net Zero and Land Rights. We hope that this publication contributes to a much-needed discussion on a topic vital to a just transition for all.



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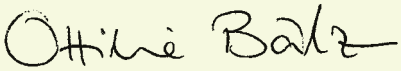

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Key messages

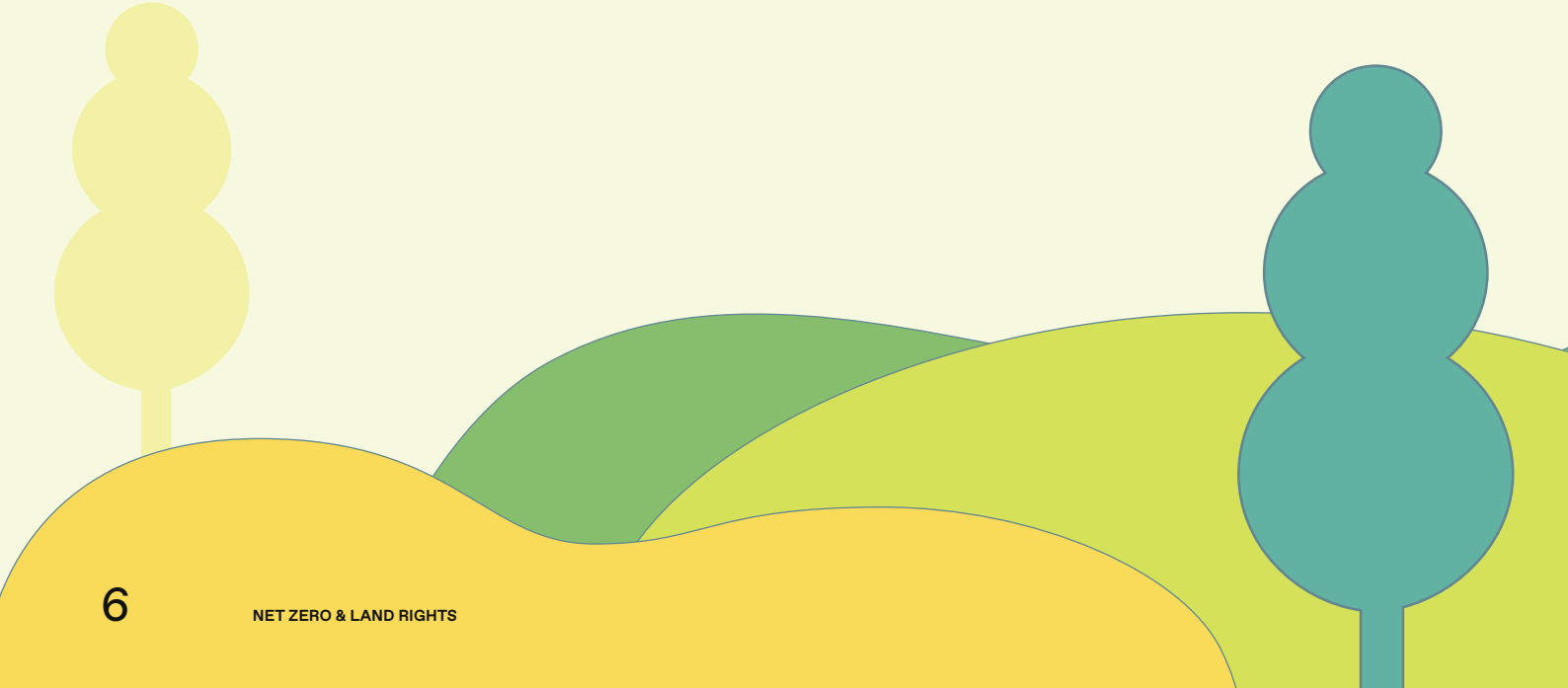
- Agriculture is the main driver of global land demand, while housing, infrastructure, biodiversity, and climate needs intensify pressure on it. Sustainable land use requires balancing these competing demands.

- Some Nationally Determined Contributions over-rely on land to remove emissions, implying a cumulative land demand of about 1 billion hectares.

- The Intergovernmental Panel on Climate Change emphasizes that limiting global warming to 1.5 °C depends on land-based carbon sequestration, including afforestation, reforestation, and peatland restoration.

- Europe's climate plan is projected to fall short of sequestering 100 million tonnes of CO_2, well below the intended 300 million tonnes target. Key measures to close the gap, such as rewetting peatlands, are not systematically supported by the Common Agricultural Policy.

- Voluntary carbon markets are currently the main avenue to channel international investments in land-based carbon sequestration. These markets pose major challenges for Indigenous Peoples and local communities.



- Carbon offset projects in regions characterised by weak land tenure and rule of law can fuel land grabs, environmental damage and community displacement.

- On the African continent, prevailing customary tenure rights offer limited protection against exploitative uses of voluntary carbon markets.

- Indigenous Peoples and local communities play a crucial role in protecting lands, forests and other ecosystems. Protecting their collective land tenure rights contributes to both preserving their ancestral territories and advancing climate goals.

- Investors in land-based carbon projects wield more power than local communities. To correct this imbalance, policymakers must prioritise communities' land rights and inclusivity to shape interventions to their benefit.

Land in Demand

Land sustains life on Earth. It is a cornerstone of sustainable development and climate action. But significant land-use changes and competing demands reveal its physical limits and highlight the absence of secure land rights for Indigenous Peoples and local communities.

Land is fundamental to human survival and prosperity. It creates a sense of identity and provides the food, fibre, shelter and raw materials essential for our existence. Of Earth's total surface area, roughly a fifth is habitable. Nearly half of this habitable land is dedicated to agriculture; the remainder primarily consists of forests, along with grasslands and shrublands. These areas provide vital ecosystem services, such as soil formation, water filtration, biodiversity preservation, and carbon sequestration.

Agriculture aside, human settlements and infrastructure currently occupy only one percent of the Earth's habitable land. However, demands on land are likely to intensify as the global population approaches 10 billion. Accompanying this projected growth are increased demands for food, energy and natural resources, all of which drive enormous land changes. If the world remains on its current trajectory, by 2050 the land needed for agriculture alone will have to expand by an additional 600 million hectares. In addition, urbanisation will also lead to a substantial expansion of built-up urban areas and infrastructure. With more and more of the world's population projected to live in cities, the land designated for urban settlements will need to almost double. Infrastructural and industrial development as a result of economic growth and improved living standards will continue to intensify demands on land.

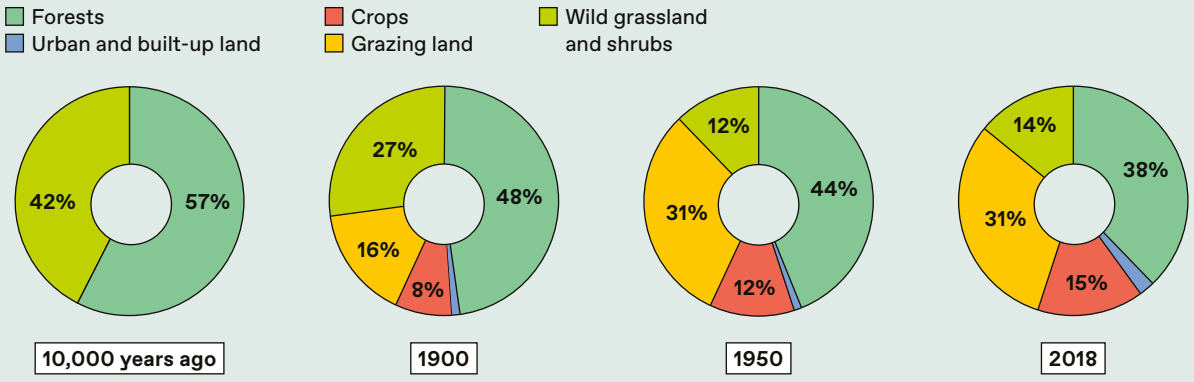
These pressures have already had sobering consequences. Human activity has transformed over 70 percent of the Earth's total land area so far. Cropland expansion and livestock grazing account for almost 90 percent of global deforestation. This widespread transformation of land contributes to unprecedented environmental degradation and climate change. Extreme weather events and other impacts of climate change accelerate land degradation by reducing soil quality, water resources and biodiversity. And yet, despite an annual loss of 12 million hectares of productive land to desertification and drought alone, the demand for land is not losing momentum.

Land is also the common thread that ties together global agendas, commitments and targets. Most of the United Nations Sustainable Development Goals (SDGs) are intrinsically linked to land and its resources. For instance, SDG 2 (Zero Hunger)

Over time, crops and grazing lands expanded significantly, spelling stiff competition for future land use.

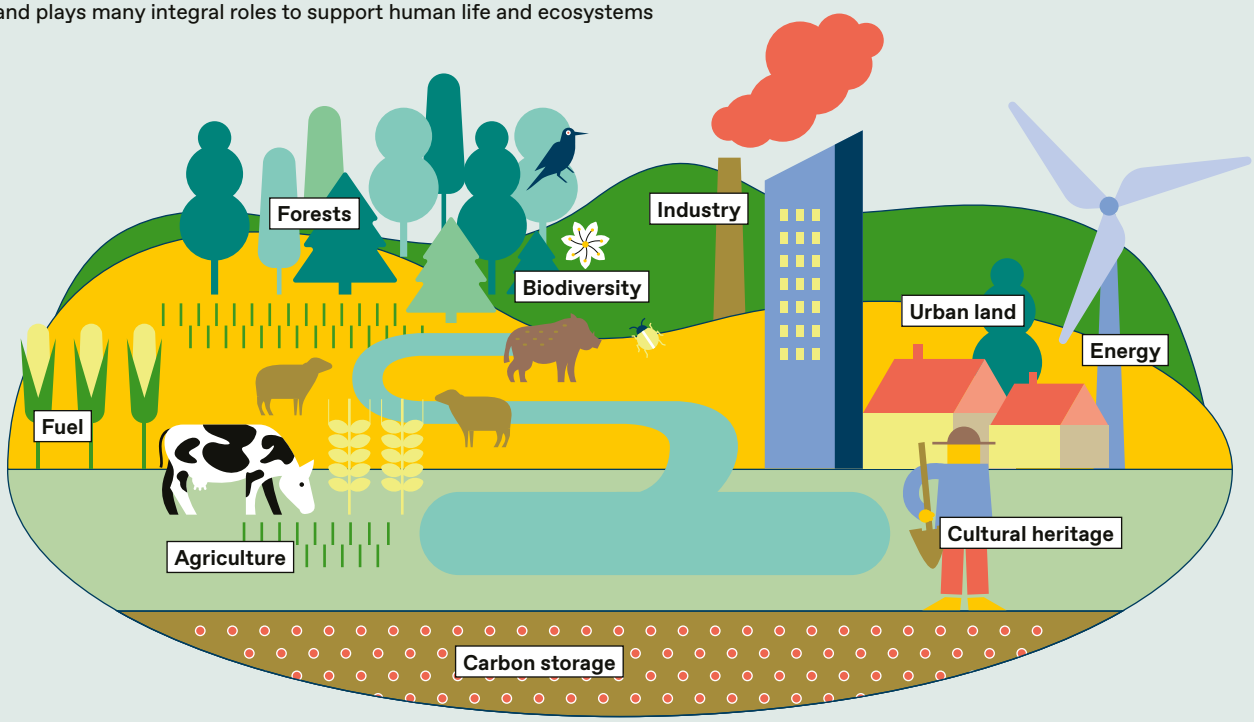
Shrinking forests and grasslands

Historical land use on Earth's habitable land surface, in percentages



We depend on land

Land plays many integral roles to support human life and ecosystems



Competing land demands exert pressure on land and its resources; global goals can add to them. Commitments must reflect land's physical limits.

relies on land for agriculture, SDG 7 (Affordable and Clean Energy) requires land for renewable energy infrastructure, SDG 13 (Climate Action) leverages land for carbon sequestration and SDG 15 (Life on Land) emphasises the protection and restoration of terrestrial ecosystems. Similarly, states rely on land to meet their commitments under the three Rio Conventions on climate change, biological diversity and desertification. This over-reliance on land creates a scenario in which the same areas of land must meet food, housing and energy demands, while also capturing carbon or conserving biodiversity.

Underlying these seemingly endless demands is an illusion of abundant, untapped land waiting to be utilised. But as humanity continues to stretch beyond our planetary boundaries, greater attention must be given to land's physical limits. Unsustainable land use, combined with the high expectations placed on land to meet global development and sustainability goals, further cements this illusion.

Treating land as infinite has serious implications. First, building global sustainability, climate and environmental agendas on this false premise can jeopardise their success. Second, much of the land committed to these agendas is home to diverse ecosystems and human communities that depend on land and its resources for their livelihoods, health and cultural identity. However, community land rights are regularly violated as a direct result of growing land demands.

Global commitments largely overlook the land rights of Indigenous Peoples and local communities, including both legal and customary rights to use, control and transfer land. For example, although land plays a critical role in sustainable development, only 3 of the 17 SDGs consider land rights. Similarly, the Paris Agreement on climate change lacks any reference to land rights even though land use and land-based measures are crucial for climate action. Consequently, decisions about land use often entail trade-offs that have far-reaching impacts on ecosystems and local communities. The lack of adequate recognition of land rights in global goals and commitments exacerbates these challenges, highlighting the need for more inclusive and responsible land governance.

The way land is treated and subsequently considered in global agreements will be critical to a sustainable future. In addition, equitable strategies must rest at their heart to ensure the recognition and respect for the rights of all land users and the limits of land, while fully considering land's ecological, social and economic dimensions.

Future Climate Pathways

Land use and land-use change are major drivers of climate change. Land also offers significant opportunities for climate change mitigation. Shared Socioeconomic Pathways project future developments of climate, society and land demand under different scenarios.

The Intergovernmental Panel on Climate Change plays a central role in shaping science-based targets and pathways. This includes the Shared Socioeconomic Pathways (SSPs) framework, which models future scenarios that assess the impacts of different socioeconomic choices, emissions trajectories and policy decisions on achieving global climate goals. The framework involves both qualitative narratives and quantitative models. The qualitative narratives outline broad societal trends across large regions, while the quantitative projections provide consistent assumptions about population, economic growth and technological change, which then feed into models of energy use, land use, emissions and other outcomes.

Global temperature depends on our commitment to development goals. SSP1 provides the only stable pathway to a future under 2 °C.

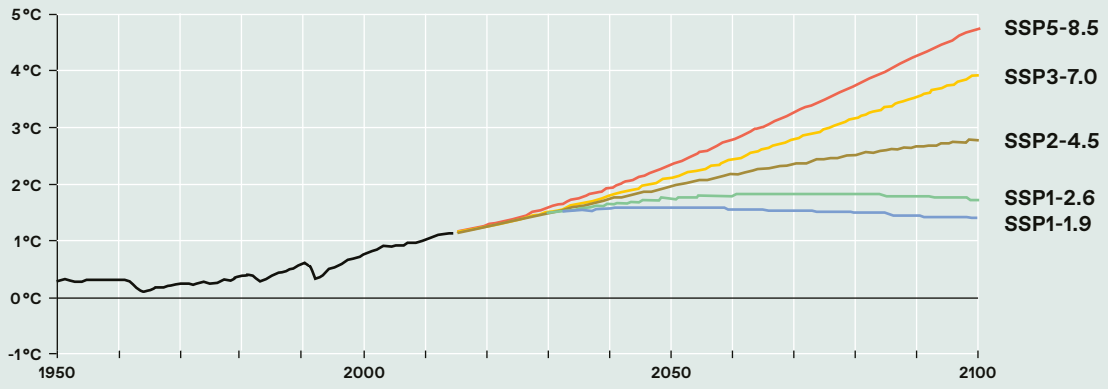
To create SSPs, projections of greenhouse gas (GHG) concentrations were linked to key socioeconomic indicators like population growth, GDP, technological progress and governance structures. This resulted in five distinct pathways that outline different futures for global society in the twenty-first century. These pathways provide plausible and consistent sequences of events up to the year 2100, describing long-term economic developments, populations, human development, lifestyles, policies, institutions, technology, the environment and natural resources over the century.

The SSPs show a scale of outcomes (SSP1 to SSP5), ranging from a future where sustainability is highly prioritised on a global scale to one where it is unequally prioritised across regions or almost completely deprioritised. Each pathway faces different challenges to climate mitigation and adaptation. In the land-use sector, factors like agricultural needs, bioenergy demands, land-use change regulations and international cooperation all significantly influence the ability to mitigate and adapt to climate change.

Each SSP includes carbon dioxide removal strategies, and in each pathway, land-based carbon sequestration plays a crucial role in restoring balance and achieving climate neutrality. The SSPs also demonstrate how the demands for agricultural land and bioenergy directly affect the extent of forest cover. Consider the different scenarios laid out in SSP1 to SSP5, which show how socioeconomic developments influence how land is allocated, regulated and protected.

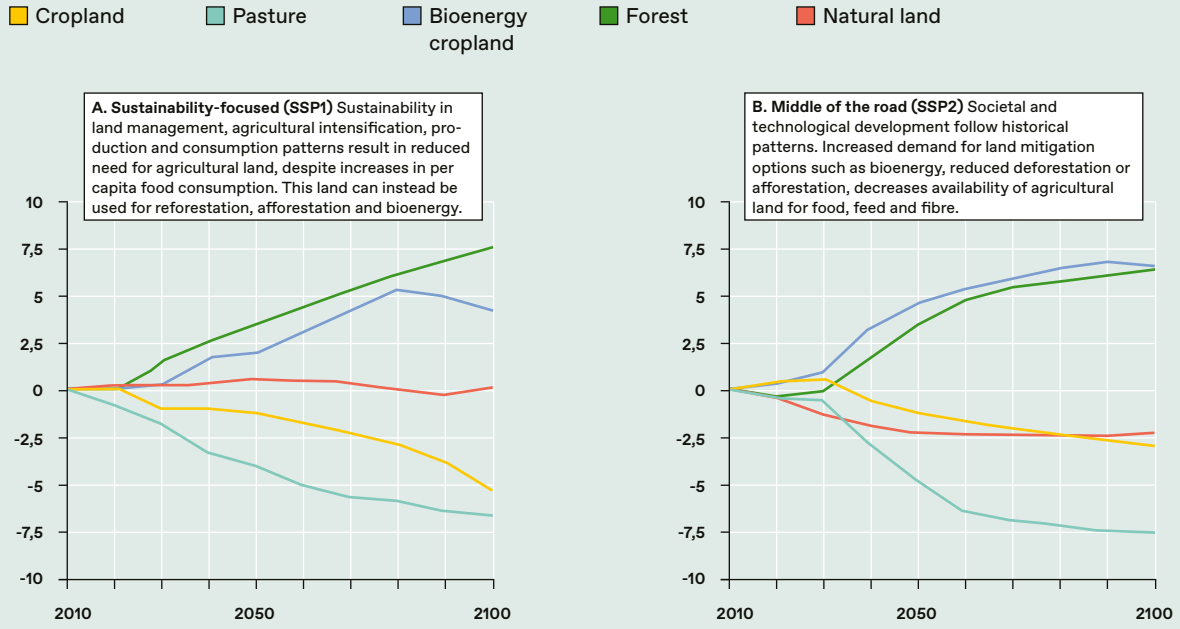
There's only one way

Projected global surface temperature change as per SSPs, in degrees Celsius



A lot more trees to limit global warming

Projected change in land use from 2010 to 2100 for SSP1 and SSP2, in million km²



Pathways that are in line with global climate goals demand significant land-use change, including a substantial expansion of forest area.

SSP1 – Sustainability (Taking the Green Path): This scenario envisions a world that makes significant progress toward sustainability, inclusive development and respect for environmental limits. A combination of pricing land-use emissions, large-scale reforestation, reduction in agricultural croplands and pastures and ecosystem restoration leads to lower GHG emissions. It also promotes soil carbon sequestration and natural carbon sinks.

SSP2 – Middle of the Road: This scenario represents a continuation of historical trends, with moderate progress in social, economic and technological development. Land-based mitigation actions are implemented gradually and moderately with balanced efforts in reforestation, afforestation, ecosystem restoration and soil carbon sequestration. However, a continued reliance on animal products increases croplands and pastures for livestock.

SSP3 – Regional Rivalry (A Rocky Road): This scenario describes a fragmented world characterised by nationalism, regional conflict and limited international cooperation, resulting in delayed implementation of climate change mitigation measures and high deforestation rates. A large increase in pasture and cropland, driven by limited agricultural intensification and population growth, leads to biodiversity and forest losses.

SSP4 – Inequality (A Road Divided): This scenario depicts a world characterised by deep inequalities within and between countries, with significant social stratification. Wealthy countries implement regulations that drive reforestation and ecosystem restoration, enhancing carbon sequestration. However, developing countries struggle to regulate land-use change due to a lack of resources, capacity and investment, leading to deforestation and ecosystem degradation.

SSP5 – Fossil-Fuelled Development (Taking the Highway): This scenario envisions rapid economic growth driven by intensive fossil fuel use, resulting in high energy demands and a reliance on technological solutions to offset emissions, such as bioenergy with carbon capture and storage (BECCS). The land needed for large-scale bioenergy production as well as a high demand for it compete with land needed for food and feed production, creating land-use conflicts.

The SSPs show that land-based carbon sequestration is essential for climate neutrality and highlight the unsustainable pressures on land to both mitigate climate change and meet agricultural and bioenergy needs. Yet, as democratic spaces shrink and international cooperation falters, achieving global climate goals becomes increasingly difficult. Only the scenario envisioned in SSP1 enables society to limit global warming to below 2 °C.

Ambition Gap: Climate Pledges Exceed the Limits of Land

Many governments and companies have pledged to reduce their carbon dioxide emissions to net zero by 2050 in order to meet the Paris Agreement targets. However, many of these pledges over-rely on land-based carbon sequestration through tree planting. This approach shifts the focus away from the source of the problem: fossil fuel emissions.

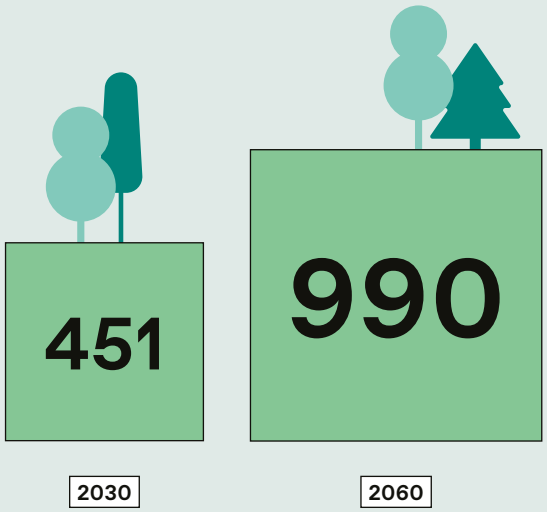
The unrealistic dependence on land to compensate for emissions has led to a staggering rise in land demands and widened the gap between land-use projections for carbon sequestration and the amount of available land. As the Land Gap Report shows, the amount of land needed to implement land-based climate protection plans is immense–approximately 1 billion hectares–roughly equivalent to the size of the United States. Making this much space available for carbon sequestration while meeting agricultural needs and maintaining biodiversity conservation will be an enormous challenge that requires significant international cooperation. Moreover, since these pledges require the conversion of land to new forests (land-use change) or the restoration of degraded land and forests (no land-use change), we must also consider the attendant risks and benefits. On the one hand, climate protection plans such as reforestation offer significant potential for carbon sequestration, improved biodiversity, and enhanced climate resilience. However, these plans also run the risk of reducing biodiversity, competing with agricultural needs and causing negative repercussions for local populations.

Consider extensive tree planting as a method for carbon absorption. While new trees can increase the amount of carbon absorbed, they may encroach on space needed for agriculture or replace natural forests, causing additional environmental and social harm. For example, if reforestation efforts focus on monoculture plantations –such as eucalyptus–in countries like Brazil and India, they may reduce biodiversity. Interventions like reforestation and afforestation can also exacerbate food insecurity and land conflicts due to multiple competing uses of land and threats to the livelihoods and rights of Indigenous Peoples and other vulnerable land-dependent communities.

But not all land-based carbon removal practices are equally damaging. Some strategies include activities to restore degraded lands and forests and to promote sustainable agroforestry and low-intensity farming. These approaches, which seek to maintain and augment carbon stocks in existing ecosystems and agricultural lands, hold greater promise in terms of climate and biodiversity protection and pose fewer threats to other dimen-

Insatiable demand

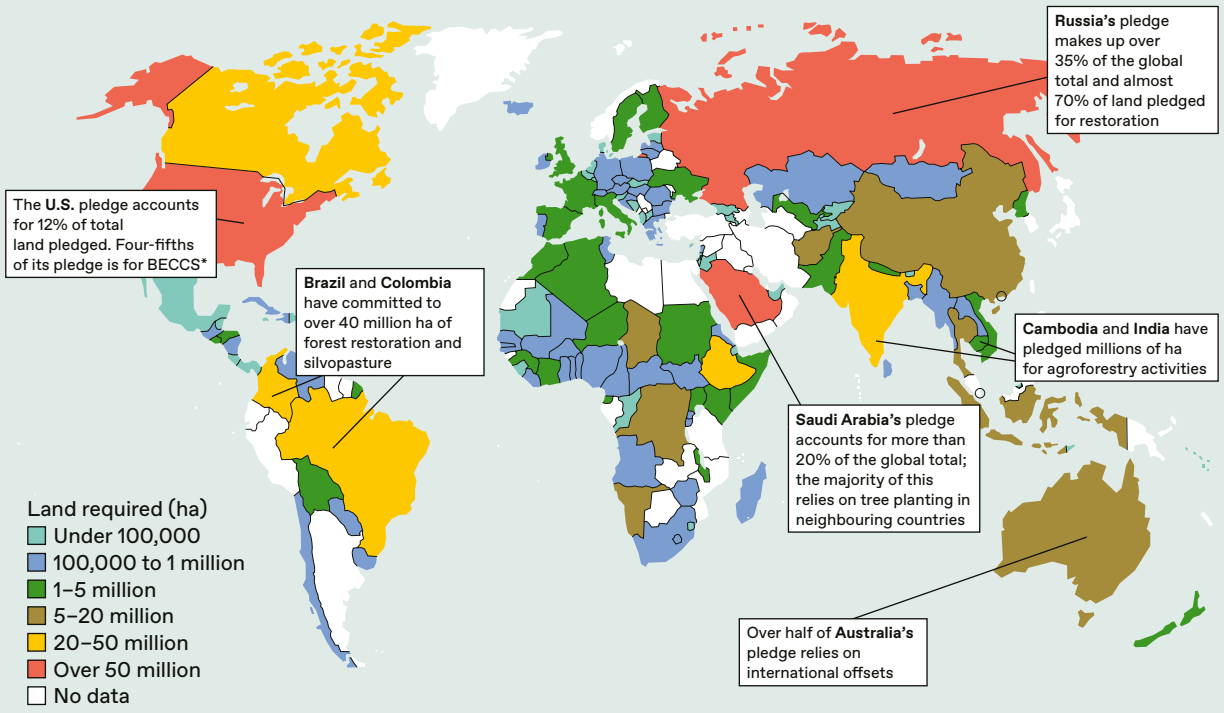
Land demand of national climate pledges based on the assumption that all pledges are implemented from 2020 onwards, in million ha



By 2060, national climate pledges anticipate a land area for carbon removal exceeding twice the size of the European Union.

National climate pledges on uncertain ground

Estimated land area needed to meet national climate pledges, in million hectares (ha)
This total land area is equal to approximately 990 million ha, if the pledges are met in full



*Bioenergy with Carbon Capture and Storage

National climate pledges show that countries excessively rely on land for carbon dioxide removal inside and outside their territories.

sions of sustainability. However, any measures applied must both respect human rights and restore ecosystem functions. Improved governance and stewardship of land and territories focused on these goals are sorely needed to achieve the multiple and interrelated needs of both local populations and the environment. Many countries with significant emissions rely heavily on land-based solutions for carbon removal. By far the largest pledges for land-based carbon dioxide removal have been made by high-income, high-emitting countries that are also major players in the international coal, gas and oil markets. Australia, Canada, Russia, Saudi Arabia, the United Kingdom and the United States have all pledged significant land-based sequestration targets to reach net zero. However, many of these nations plan to meet their targets through international offsets, shifting their climate mitigation burden to land in other countries. This approach risks shifting the focus away from the immediate actions needed to reduce emissions from fossil fuels and industrial processes in the countries of origin, which is essential to limit global warming to 1.5 °C.

Protecting and restoring primary forests and other intact ecosystems is the most impactful way of combating climate change on land. Not only does it aid in climate change adaptation, but when done correctly, it also helps conserve biodiversity and essential ecosystem services. Preserving carbon-rich ecosystems, especially the remaining primary forests in boreal, temperate and tropical regions, is a crucial element of effective climate action. This is particularly important given that primary forests store significantly more carbon than logged forests or plantations.

However, if land restoration efforts are to contribute genuinely to climate change mitigation, they must increase carbon storage beyond what would naturally occur. Climate mitigation pledges based on land aim to address this increased need but have so far failed to consider competing demands on land for food security, ecosystem and biodiversity protection, and livelihoods and local culture. New strategies in land-based carbon sequestration must be realistic about land availability and examine land use holistically to avoid irresponsible and harmful practices and protect the rights of Indigenous Peoples and local communities.

Europe Misses the Mark on its Climate Goals

The European Union aims to remove 310 million tonnes of CO_2e through land-based strategies by 2030, but this target is unlikely to be met. Member States may look beyond their borders, risking unsustainable practices and land grabs to bridge the gap.

European climate policy is guided by the European Climate Law, a legal directive for Member States for achieving climate neutrality by 2050. Its "Fit for 55" target aims to reduce carbon dioxide equivalent (CO_2e) emissions by 55 percent by 2030 compared to 1990 levels. These ambitious goals have led to significant policy changes across sectors but warrant further scrutiny.

The European Union's (EU) land use, land-use change and forestry (LULUCF) regulations are a critical part of the bloc's plan to achieve climate neutrality. Originally created in 2018 and revised and expanded in 2023, the regulations include improved monitoring, reporting and verifications of removals and emissions, as well as a synergetic approach to climate mitigation and environmental protection. Crucially, the revised regulations increase the target for land-based carbon removal to 310 million tonnes of CO_2e per annum by 2030. However, the EU was found to be off track to meet the original LULUCF targets and will likely miss this 2030 target by at least 50 million tonnes.

The gap between ambition and reality is bound to affect policy. Many of the EU's climate targets rely on land-based carbon removal through methods like ecosystem restoration, forest management and reversal of land degradation. At the same time, the fact that targets are not being met indicates that current land use and carbon removal strategies are insufficient, which could result in an intensification of land-based climate mitigation efforts.

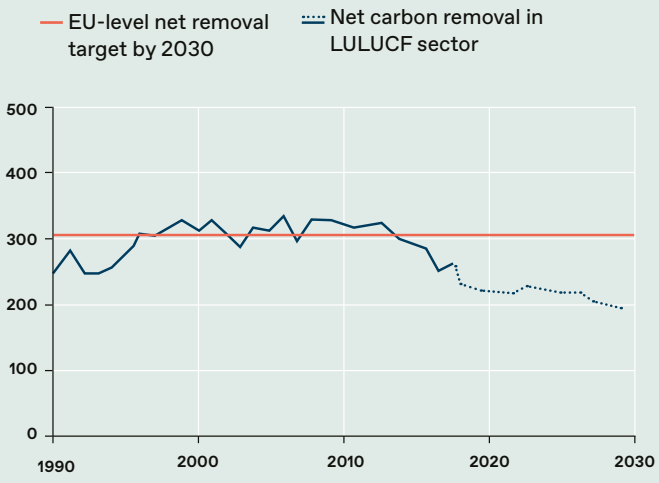
To that end, recent policy initiatives aim to incentivise sustainable land management practices that can restore Europe's ecosystems and natural carbon sinks. The Nature Restoration Law aims to implement restoration projects such as habitat protection and adaptive land use practices to at least 20 percent of the EU's lands and seas. The recently approved Carbon Removals and Carbon Farming Certification Regulation is another step to regulate and structure carbon removal in the EU based on three pillars: carbon farming (soil-based carbon sequestration and emission reduction), carbon storage in products and permanent removal.

The intensification of land-based climate mitigation efforts such as these may exacerbate already unsustainable land demands and negatively affect ecosystems and biodiversity. Further, they still seem insufficient to bridge the gap, as the EU continues to miss its climate targets. As a result, EU Member States may start to look outside their borders to meet their climate commitments, which could increase land pressures in regions where governance and environmental safeguards may be weaker.

The reform of the EU's common agricultural policy is a key element in meeting the bloc's climate targets.

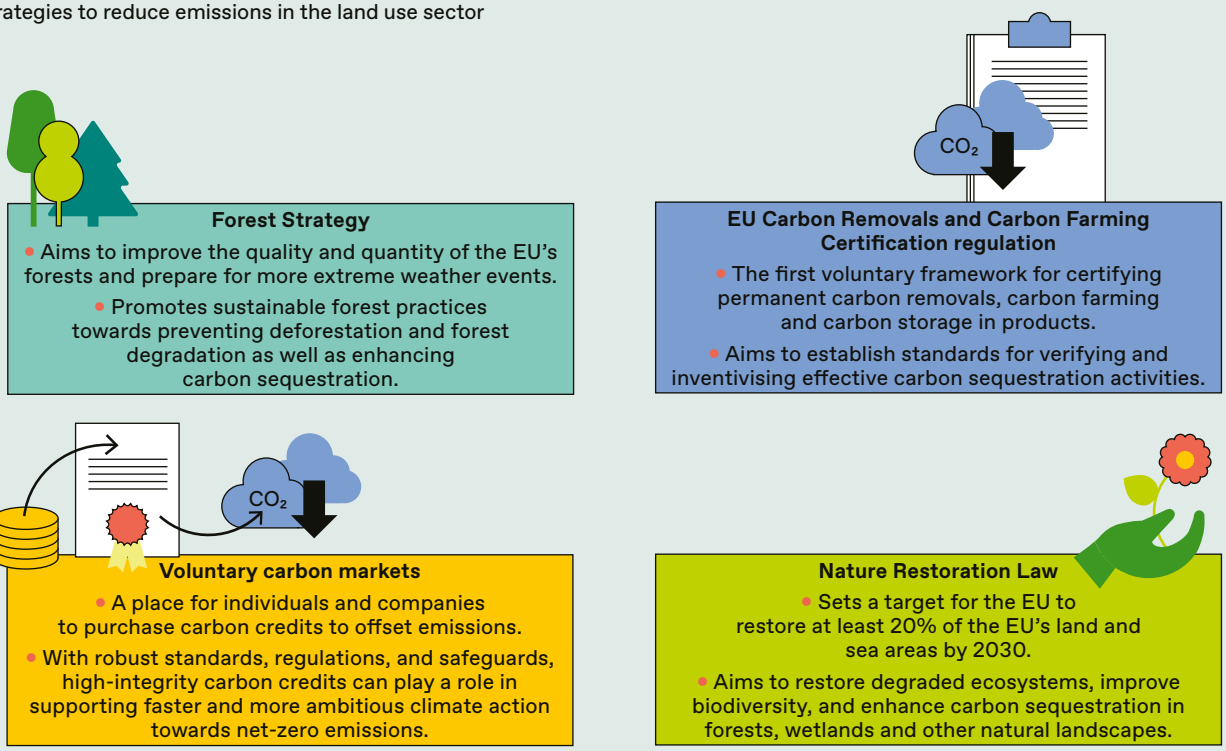
The EU must protect its carbon sinks

Historical and projected net carbon removal in LULUCF sector, in million tonnes CO_2e



The EU's avenues towards net zero

Strategies to reduce emissions in the land use sector



Shifting majorities in the European parliament are likely to undermine further strategies towards net zero.

Large EU companies are increasingly involved in climate-neutral initiatives, such as offsetting emissions from travel and packaging, and seek to prevent negative environmental impacts both in the areas where the company operates and where their business partners operate. However, these theoretically sustainable practices may be at odds with the intention of EU regulations and can have significant ramifications. Private companies like IKEA, for example, plan to reduce greenhouse gas emissions up to 90 percent by 2050 but rely on significant contributions from carbon removals and storage. This includes buying over 20,000 hectares of land in New Zealand for monoculture plantations to sequester carbon at the expense of communities and biodiversity.

Energy policies also have the potential to contribute to unsustainable land-use practices. The REPowerEU plan aims to reduce the EU's dependence on Russian fossil fuels by diversifying energy imports and promoting renewable energy, including hydrogen. The REPowerEU plan advises Member States to engage in "a wide consultation process" and ensure broad ownership for energy projects. Yet, it fails to consider the extensive land impact energy imports such as hydrogen have outside the EU. For example, hydrogen production requires vast amounts of water: the International Energy Agency estimates that nine litres of water are used for every kilogram of green energy produced. In countries prone to droughts, diverting water supplies for hydrogen production could not only cause water scarcity for local populations, but also create a ripple effect on local land use and demand.

It is clear that shifting land-based carbon removal activities and energy demands to countries outside the EU could lead to increased land pressures, unsustainable practices and land grabs. The EU must ensure uniformly high standards of protection against the neocolonial exploitation of land and water and avoid depriving countries outside the EU of resources needed to meet domestic needs. To avoid burden-shifting and increasing pressure on land elsewhere, the EU must tackle the root causes of emissions within its own borders.

The EU has previously supported the "one credit, one claim" approach in international negotiations under the Paris Agreement Article 6.4. Its apparent abandonment of this in domestic policy could significantly impact future discussions on international carbon credit project rules.

Land Grabbing and Global Climate Action

Carbon markets have revived a rush for land to mitigate climate change, leading to a new wave of land grabs that threaten people's rights, especially under customary land tenure systems. As governments target 1 billion hectares for land-based carbon removal by 2060, carbon offsetting must not justify these trade-offs.

In the late 2000s, a global land rush prompted by soaring food prices led to international investors acquiring about 30 million hectares (ha) of land in low- and middle-income countries for agribusiness and other enterprises. This rapid shift in land ownership severely impinged on the land rights of local populations and led to the displacement of local communities and smallholder farmers.

Recently, pressures linked to global climate action threaten a new era of land grabs that may result in similarly devastating consequences. These include large-scale climate mitigation measures that shape land use through the protection and restoration of forests and ecosystems, as well as reforestation and afforestation projects that establish tree plantations or new secondary forests.

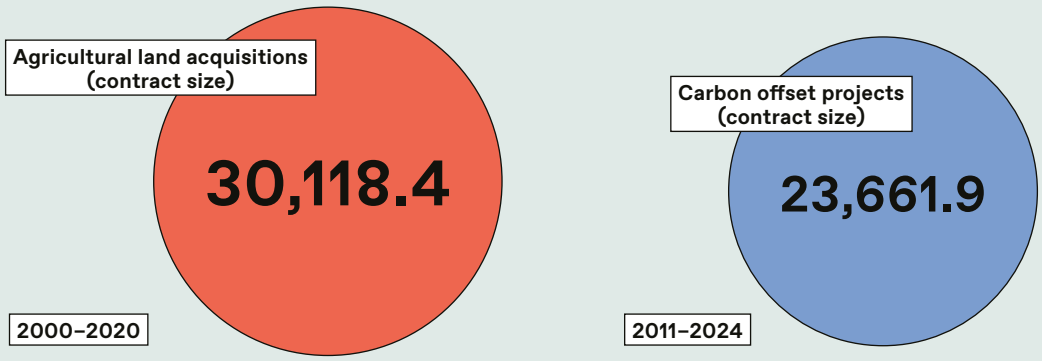
In order to meet their climate mitigation pledges, governments worldwide need to allocate approximately 1 billion ha of land for restoration, reforestation and afforestation by 2060. Additionally, the voluntary carbon market, where different actors can obtain carbon credits to offset their emissions, has significantly increased the demand for land. Verra's Voluntary Carbon Standard, one of the largest carbon crediting mechanisms, has registered land-based carbon offset projects covering nearly 24 million ha, with over 90 percent registered since just 2017. About 80 percent of these projects focus on forest protection, reforestation and afforestation, with 36 percent located in Africa, where land rights are often undocumented.

While increasing investments in climate mitigation are crucial in addressing the global climate crisis, their scale and the involvement of new actors such as private companies in regions where customary land tenure systems and other types of undocumented land rights still prevail is concerning. This is particularly true when considering the sobering track record of large-scale agricultural investments in these regions. The current scale of land-based carbon offset projects registered with Verra is already comparable in size to the large-

Nearly 24 million ha are committed to carbon offset projects, rivalling the scale of the heavily criticised global land rush of the 2000s.

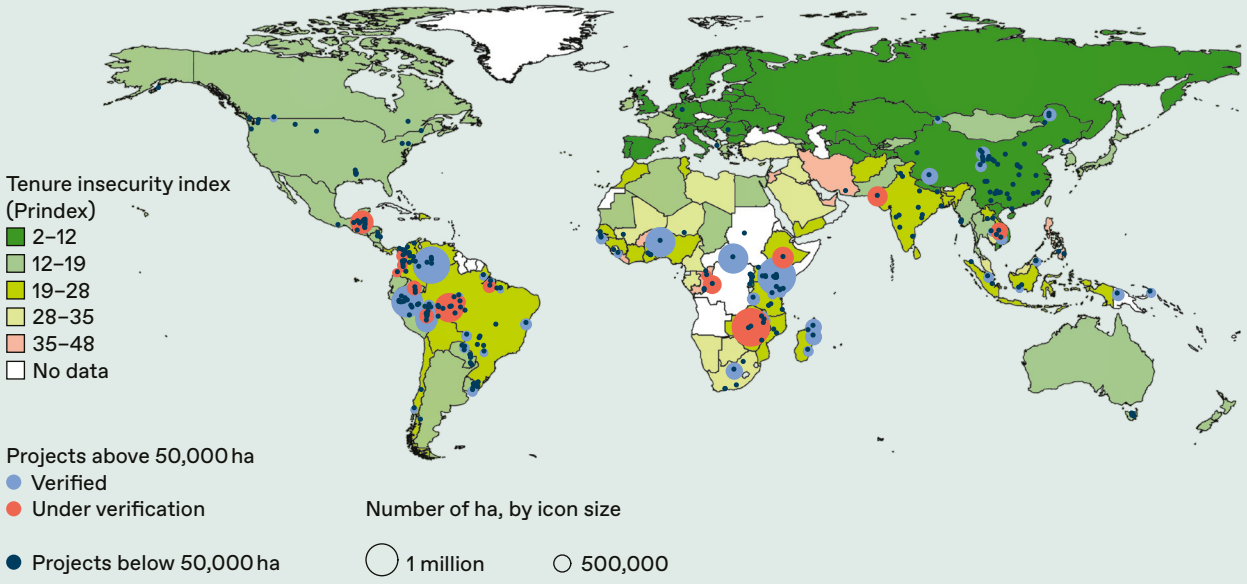
Déjà vu? The land rush returns

All Verified Carbon Standard projects from the Verra registry related to Agriculture, Forestry and Other Land Use with status "registered", "late to verify" and "verification approval requested", in thousand ha



People's land rights at risk

Size of land-based carbon projects and countries' levels of tenure security



The largest investments in land-based carbon projects occur in areas where land rights are insecure, putting local communities at risk.

scale land acquisitions for agriculture by international investors in Africa over the past two decades. While many projects in the voluntary market are involved in partnerships with local communities that maintain previous ownership rights and involve benefit sharing, others occur on state-owned lands and do not recognise customary land rights or involve large-scale purchases and concessions by private companies. Human rights violations and land conflicts have already been reported for many of the latter projects, including those recognised through international standards.

Projects relying on large-scale land acquisitions and involving the protection or restoration of forests thus merit deeper scrutiny, especially when they take place in areas where land rights are insecure. In the Democratic Republic of the Congo, for example, 5 percent of the country's total land area is used for logging concessions, some of which have already been repurposed into forest conservation concessions for carbon offsetting. Companies like Portuguese-owned Nordsudtimber first profit off logging concessions, then seek to profit further by converting the logging sites into carbon credit initiatives. The conversion of large logging concessions into carbon offset projects involves critical weaknesses. First, the logging concessions that were converted often involved severe violations of the land rights of Indigenous Peoples and local communities. Second, although the local population has been protecting these forests for centuries, few benefits are shared, and their participation and engagement remain limited.

Reforestation and afforestation represent another major form of land-based climate change mitigation that can create conflicts over land. Forest Neutral Congo in partnership with TotalEnergies planned to demarcate 40,000 ha for an acacia tree-planting project in the Republic of the Congo, sparking land conflicts due to encroachment on community lands without adequate consultation or compensation, leading to tensions over land rights and resource access.

These cases demonstrate that land is not just a resource for production or climate mitigation but a vital part of the livelihoods and identities of communities across the globe. Local populations have been protecting these forests for centuries. Land tenure systems have often gone unacknowledged by international actors, and violations of the free, prior, and informed consent standard that protects Indigenous Peoples' rights are all too common.

Until now, no clear processes have been established for how the new carbon offset projects should redress prior injustices. However, it is clear that partnership with communities, as well as community-driven measures are key in the execution of climate projects to ensure that trade-offs are not made between protecting the climate and people's rights to land and secure livelihoods.

Africa's Carbon Market Dilemma

Africa's natural landscapes have huge potential for climate change mitigation. As a result, the continent has attracted intense interest from carbon markets. However, this often occurs at the expense of local communities. Legitimate land rights must be protected to ensure that climate action in Africa is both effective and equitable.

Africa is home to some of the world's largest natural carbon sinks. Through its forests, grasslands and diverse wetland ecosystems, the continent plays a key role in global efforts to mitigate climate change. Africa's forests alone are estimated to remove about 1.1 gigatonnes of carbon dioxide from the atmosphere annually, equal to 20 percent of Europe's yearly emissions. Consequently, the continent has increasingly become the focus of land-based measures to mitigate climate change.

Carbon markets, particularly voluntary carbon markets, have become a prominent mechanism for financing climate mitigation measures, with recent developments at the 29th United Nations Climate Change Conference (COP29) underlining their growing influence. The carbon credits market is projected to increase to 50 billion US dollars by 2030. This form of trade is based on projects that either reduce, remove or offset greenhouse gas emissions, typically through reforestation, afforestation, improved forest management or forest conservation. Yet these interventions often come at a significant cost for local communities.

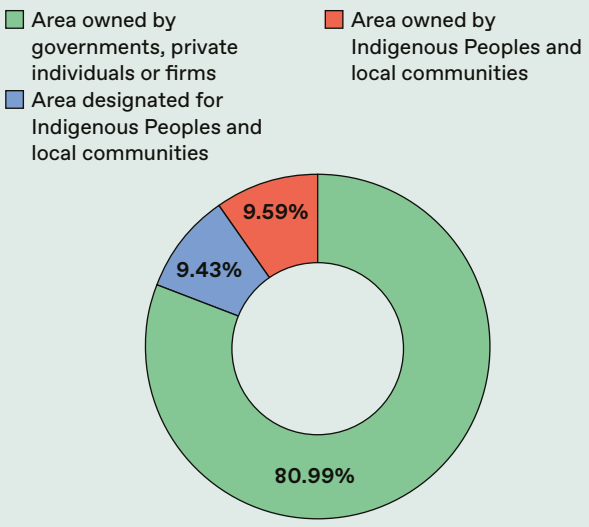
Carbon credits–carbon offset credits in particular–have been criticised as ineffective in reducing emissions, as many land-based projects fail to deliver the promised environmental and social benefits. Additionally, these initiatives often depend on access to large tracts of land, intensifying demand and causing conflicts with existing communities.

Such conflicts are particularly concerning in Africa, where land ownership is frequently characterised by a complex blend of formal and informal land tenure systems. In many parts of the continent, land rights are based on custom rather than law, and land is often held communally. Customary systems often lack formal legal recognition and protection, leaving local communities vulnerable to external pressures and land acquisition. For example, in Niger, only 4.5 percent of the adult population has documents verifying land ownership, titles and use. Rates of tenure security are higher elsewhere in Africa, such as in Benin and Uganda, where the figures stand at 36 and 43 percent respectively. However, substantial portions of the population, including both farmers and pastoralists, still lack the legal title to their land.

The implementation of carbon offsetting projects in Africa and the associated growth in demand for land have had significant impacts on the land rights and land tenure security of Indigenous Peoples and local communities. For instance, a

Communities losing ground

Percentage of land ownership in Sub-Saharan Africa, including 23 countries*

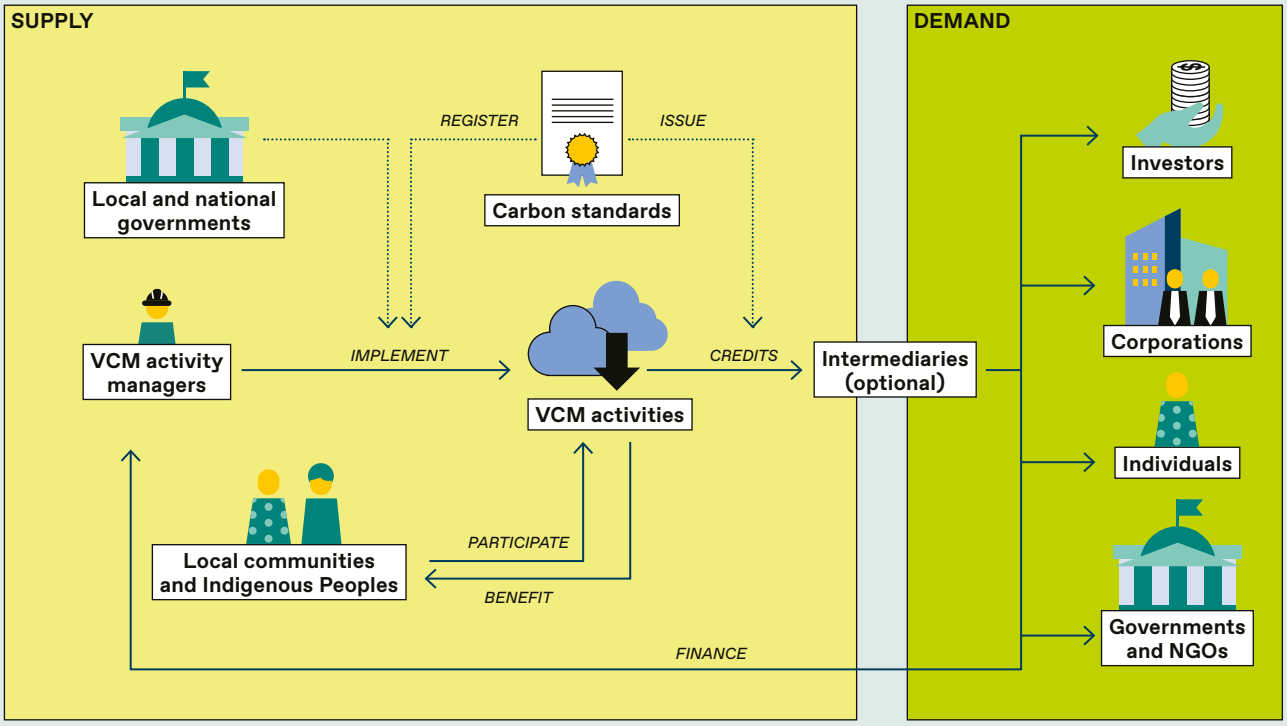


* Including Angola, Botswana, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Republic of the Congo, Ethiopia, Gabon, Ghana, Kenya, Liberia, Madagascar, Mali, Mozambique, Namibia, Senegal, South Sudan, Suda, Tanzania, Uganda, Zambia, Zimbabwew

Between 2015 and 2020, the share of total communal land shrank by 2.4 million ha, with losses outpacing gains.

An opaque global marketplace

Schematic presentation of actors and their roles in the Voluntary Carbon Markets (VCM)



long-term carbon offset project in northern Kenya restricted the traditional pastoral practices of the Borana and Samburu people by reforesting land traditionally used as grazing pasture. It also disrupted and prevented migrations that typically follow rainfall during increasingly severe seasonal droughts. In another case, in Uganda, Norwegian-owned company Green Sources acquired rights to implement plantation forestry with carbon offsetting measures on almost 12,000 hectares of the Central Forest Reserve, a traditional site for pastoral, agricultural and cultural practices of local communities. Since the acquisition, reports have surfaced from these communities of forced evictions, access denial, impacts to their livelihoods and even physical violence.

These developments reveal a common pattern: carbon offsetting projects often prioritise financial gain over the socioeconomic needs of people. Those who hail carbon markets as the solution to Africa's climate finance gap, valued at 200 to 400 billion US dollars annually, tend to overlook the markets' failures in delivering real benefits to local populations. For climate mitigation efforts in Africa to be genuinely sustainable, all actors must work to protect existing land rights, ensure mutual benefit and safeguard against predatory practices.

Indigenous Peoples and local communities often only receive a fraction of profits from carbon credits trading.

Some climate mitigation projects are already working towards these goals. In Tanzania's Yaeda Valley, the land rights NGO, the Ujamaa Community Resource Team, teamed up with representatives of the Hadza people–historical inhabitants of the land –and two British volunteers. Together, they created Carbon Tanzania. This carbon offset project sells credits for forest conservation carried out in part by the Hadza who both retain their traditional custodial rights and, alongside other local communities, receive 60 percent of project revenue. A portion of this income has already been planned for further conservation training and development within the Hadza community.

Projects like these demonstrate that climate mitigation efforts designed and implemented with active community engagement have the potential to not only secure land rights and provide benefit sharing and safety for local populations, but also expand the possibilities of conservation efforts. In order to create holistic and responsible land-based measures to mitigate climate change in Africa, the importance of land rights must be foregrounded.

No Territory without Ties

The myth of "empty" land in the Global South underpins the marginalisation of Indigenous and local communities in land-use decisions. Safeguarding their legitimate land rights and traditional stewardship practices is key to effective biodiversity conservation and climate action.

The age of modern colonisation saw the propagation of the "empty land" theory: a justification for the seizure of land based on the claim that the land was uninhabited, or those who lived there had no right to remain. As present-day Western powers set their sights beyond their borders for land-based climate mitigation measures, the false promise of "unused" land in the Global South echoes this colonial attitude. A prime example is the Congo Basin, a vast ecological area that extends over six African countries, including Cameroon, the Central African Republic, the Democratic Republic of the Congo (DRC), Equatorial Guinea, Gabon, and the Republic of the Congo. The basin, which contains the second-largest rainforest in the world, is a vital carbon sink that plays a crucial role in the global carbon cycle. However, while the Congo Basin rainforest is seen as an "intact wilderness", it has been inhabited for millennia.

Almost 150 ethnic groups and Indigenous Peoples like the Ba'Aka are connected to the forest, depending on it for food, shelter, water and cultural practices. However, while this land is home to many, there is little in the way of formal land titles. Instead, traditional tenure systems allow communities to allocate and manage collectively owned land for activities such as agriculture and pastoralism. The result is not a Western system with many individual claims and extensive documentation, but a customary tenure system that is not legally recognised in any of the countries the Congo Basin spans.

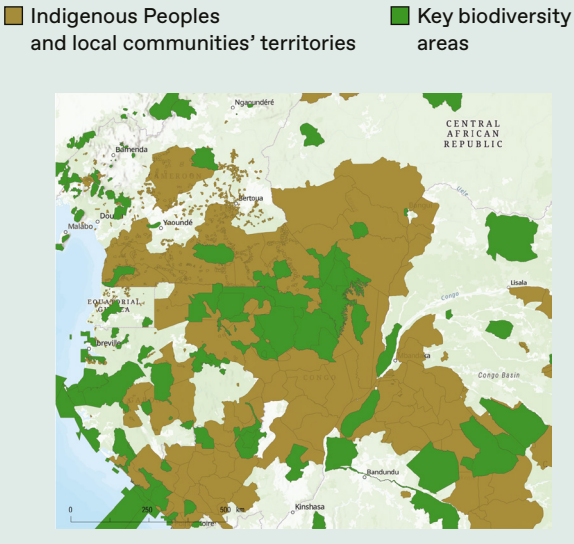
It is partially due to this traditional land tenure system that communities in the Congo Basin have been sidelined from land-use legislation around environmental protection and climate mitigation in recent years. Governments and other stakeholders are often unwilling to acknowledge traditional land rights. The result is that forest-dependent communities can end up marginalised from key land-use decisions, even as they bear the brunt of the consequences. A stark example of this is the creation of strictly protected areas in the Congo Basin region in territories claimed by local and Indigenous communities. This practice has displaced hundreds of thousands of people according to conservative estimates, and continues to this day.

Even as local and Indigenous communities are physically or economically displaced from their lands in the name of environmental action, such as carbon offset projects, there seems to be little concern as to how these measures may negatively affect not just these groups, but the very land the measures aim to protect. Indigenous Peoples and local communities play a critical role in protecting ecosystems. Around 80 percent of the world's biological diversity is found in the 22 percent of global land area still stewarded by Indigenous Peoples. Indigenous stewardship practices have restored forests, and their pastoral practices have managed soil carbon levels. On both the macro- and micro-

Indigenous Peoples and local communities manage 54 percent of the world's intact forests, totalling 610 million hectares in 2020.

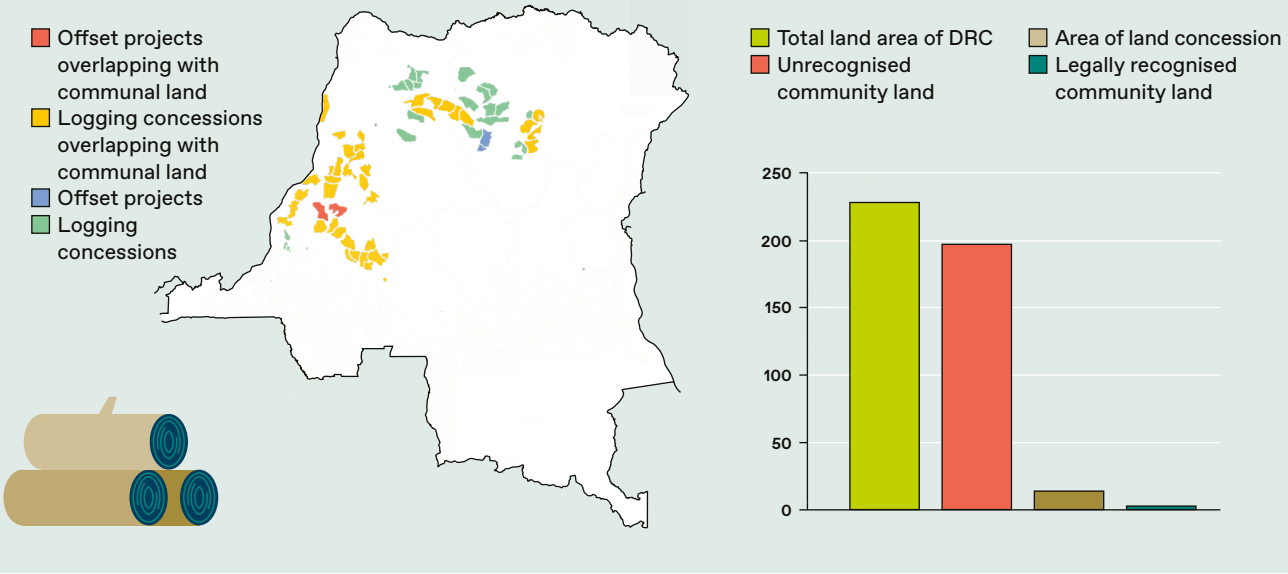
Conservation through communities

Overlapping areas between Key Biodiversity Areas and Indigenous Peoples' and local communities' territories in the Congo Basin



Unrecognised and under threat

The division of areas for carbon offset projects and logging concessions and their overlaps with communal land in DRC



Logging and carbon offset concessions in the DRC overlap with communal lands, risking rights and livelihoods.

levels, Indigenous knowledge and its application are essential for environmental protection.

Despite the important relationship between local and Indigenous communities and their land, progress towards restored land rights has been slow. In the Congo Basin, some measures have started to bridge the gap. Many Congo Basin countries now include "community forests" in their forest legislation, and communities are typically given perpetual rights for activities such as small-scale timber production or hunting over a set period. In the Democratic Republic of the Congo, communities can even claim lifelong concessions for up to 50,000 hectares of land, a process that started in 2016. As a result, Indigenous and local communities formally control a tiny portion of the Congo Basin rainforests.

However, to make a lasting impact, there must be better recognition of the essential role these communities and their traditional, collective land tenure systems can play in reaching environmental goals. Studies have shown that enabling practices such as communally managed forests can lead to positive environmental outcomes. Traditional and Indigenous agricultural practices such as rotating crops and land use can lead to high carbon sequestration in soil and greater species diversification. By demanding that Indigenous and local communities come first, we can ensure not just lawful protections of long-standing land rights, but better and more effective environmental and climate mitigation strategies. A first step would be to support participatory mapping in the vast unmapped areas of the Congo Basin. This should provide invaluable anthropological, socioeconomic and demographic information that has so far been absent from policymaking. Moreover, accurate georeferenced maps could provide communities with a powerful tool to prove and claim their ancestral ties to their territory.

Despite their invaluable role for people, climate and nature, the forests of the Congo Basin are under threat.

Africa's largest rainforest

The relevance of the Congo Basin forests

1 in **5** of the **planet's recorded species** is found in the forests of the Congo Basin.

0.61 **net gigatonnes of carbon dioxide equivalents** are absorbed per year by the Congo Basin's forests, the world's largest tropical carbon sink.

60 **million people** who live in or near forest areas rely on the forests of the **Congo Basin** for their livelihoods.

40 **million people** in nearby urban centres are indirectly **fed by these forests.**

Land Rights for Net Zero

Current efforts to achieve climate neutrality often neglect the land rights of local populations and Indigenous Peoples. Driven by expanding carbon markets, land-based carbon projects have already triggered human rights violations. Policymakers must prioritise inclusivity to ensure communities living on the land benefit from these interventions.

Changes in land use are essential to current climate mitigation efforts. Achieving net zero by 2050 necessitates reducing land-use emissions, principally by decreasing or halting deforestation and decreasing industrial livestock farming. Further, climate models demonstrate the need to sequester CO_2, primarily through afforestation, reforestation and rewetting peatlands.

Land-based projects that reduce, remove or avoid carbon emissions do not yet systematically acknowledge Indigenous Peoples and local communities' land rights. The failure to acknowledge land rights in land-based carbon projects can have serious social consequences, such as displacement of local communities, deterioration of women's land rights or heightened violent conflicts over land within and between communities. In one such case, the Ogiek community in Kenya was evicted from their ancestral lands in the Mau Forest, ostensibly in the name of forest conservation for the purpose of climate mitigation.

However, parties to the United Nations Framework Convention on Climate Change (UNFCC) have already adopted binding human rights agreements that acknowledge access to land as a key element of several substantive human rights, such as the right to food and housing. Further, the rights to information, participation, equality and self-determination are considered procedural rights and are equally enshrined in binding human rights treaties. These human rights agreements also apply in the context of climate policies and land-based climate mitigation measures. States have the obligation to protect local communities and Indigenous Peoples' land rights.

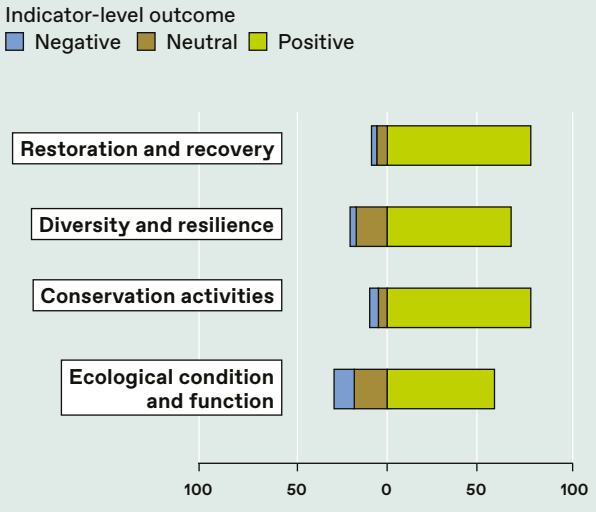
Indigenous Peoples and local communities claim customary rights to approximately 65 percent of the world's land area. However, only a small portion of this–10 percent–is officially recognised as formally owned, and 8 percent is recognised as being under their control. At the local level, rights to access, use and extract resources may be allocated to different individuals or groups, leading to varied claims on ownership and use. Women in the Global South often only hold informal access rights and therefore risk exclusion from potential payments related to carbon sequestration. It is therefore crucial to understand local land rights, as well as uphold the rights of both communities and individual actors. Not only is this essential for just climate mitigation policy, it is also more effective. Analyses of protected areas show that participatory management of these areas is associated with better protection outcomes. In other words, alienating people from their lands actually decreases the likelihood that carbon will be sequestered.

There needs to be a shift in the current power imbalance between local communities and those

Communities are successful ecosystem stewards when they have the rights and resources to do so.

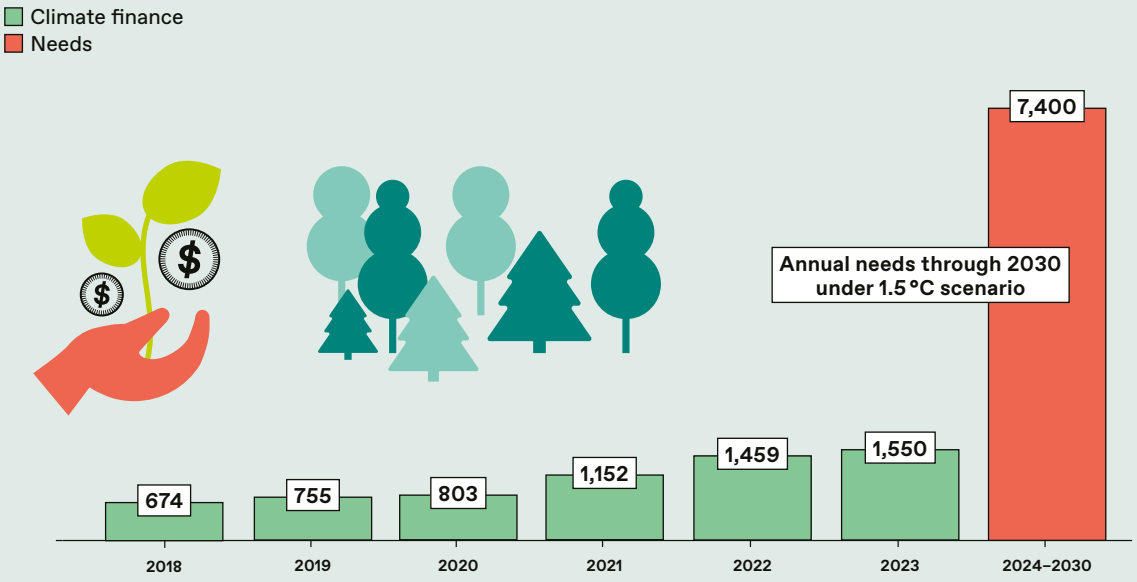
No contradiction

Environmental outcomes of community-based conservation projects, in percentages



A glaring gap

Climate finance and projected annual finance needs (in billion US dollars)



Responsible investments in land-based climate mitigation projects could contribute to meeting climate finance needs.

who invest in land-based carbon projects. Protecting land rights is a necessary first step to achieve this. Local communities need decision-making power over land use, including, for example, the right to reject reforestation or carbon market projects that impinge on their rights, livelihoods, cultural practices or access to essential resources. Democratic spatial planning processes and community-led participatory mapping of legitimate land rights are key. These empowering approaches are imperative not only for sustainable land management but also for the revitalisation of traditional cultures and knowledge systems. If a community consents to engaging in a carbon market project, additional support, such as legal counselling, empowerment initiatives and access to justice are necessary to address power imbalances between communities and carbon project developers. Reducing the involvement of middlemen and working directly with local communities could be the first steps toward ensuring equitable distribution of benefits.

As investments in carbon markets develop significantly faster than efforts to regulate them, it is crucial to establish grievance mechanisms for land-based carbon projects. Existing rights holders and land users must have the opportunity to communicate rights violations and seek redress effectively.

The protection of women's land rights is a crucial step to achieve inclusive land-based carbon sequestration. Parties to the UNFCCC can build on progress made in the other two United Nations Rio Conventions Conventions on biological diversity and desertification. These two conventions include specific decisions on land tenure or land rights-related indicators. The further development of UNFCCC's Gender Action Plans offers a promising avenue to advance these efforts.

Furthermore, as Parties to the UNFCCC negotiate a Just Transition Work Programme, a broader understanding of what the just transition entails must be embraced: one that goes beyond the present focus on jobs, principally in the Global North. Moreover, land rights and community empowerment should be incorporated into climate strategies to ensure that the transition to net zero is both environmentally sustainable and socially just. A more comprehensive understanding should also address historical injustices and create opportunities for marginalised communities to benefit from climate action. A just transition involves not only technical solutions, but also governance reforms that promote inclusion and equity. This means creating mechanisms for meaningful participation of local communities in climate policy-making and programme design and ensuring their rights and interests are protected.

Authors and sources for data and graphics

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TMG is headquartered in Berlin, with a team in Nairobi. Our research focuses primarily on the European Union and Africa, including Benin, Kenya, Madagascar, Malawi and South Africa.

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