TECHNICAL GUIDANCE

STEP 3

MEASURE, SET, & DISCLOSE

LAND

Version 1.0—July 2024

SCIENCE BASED TARGETS NETWORK
GLOBAL COMMONS ALLIANCE

Acknowledgments

This guidance was developed by the Science Based Targets Network's Land Hub as a contribution to the Science Based Targets Network (SBTN), which aims to transform economic systems and protect the global commons—our air, water, land, biodiversity, and ocean. SBTN unites experts from more than 80 non-governmental organizations (NGOs), business associations, and consultancies to collectively define what is necessary to do "enough" to stay within Earth's limits and meet society's needs.

In partnership with SBTN, the Land Hub is a collaboration between World Wildlife Fund, Conservation International, The Nature Conservancy, World Resources Institute, and the Food and Land Use Coalition. The objective of the SBTN Land Hub is to develop and promote a methodology that will allow companies to set, track, and measure progress on quantifiable targets that are representative of the progress required in land systems to sustain nature and people. The Land Hub is responsible for developing the technical content of these targets for inclusion as part of SBTN's multi-stakeholder, multi-year initiative to provide companies with comprehensive science-based targets for nature.

This guidance is primarily funded by the in-kind contributions of the core organizations that comprise the SBTN Land Hub and the organizations with which we collaborated on this work. In addition, Rockefeller Philanthropy Advisors and SBTN provided funding to support the Food and Land Use Coalition/ Systemiq. The development of Land targets is also funded in part by the Gordon and Betty Moore Foundation, Norway's International Climate and Forest Initiative, and Robert Bosch Stiftung.

The Land Hub engaged Systemiq as our primary consultant partner to collaborate and lead the development of this version due to their role as a core partner of the Food and Land Use Coalition. We would like to acknowledge the outstanding support of Systemiq as an organization, specifically including Marco Daldoss Pirri, Alessandro Passaro, and Scarlett Benson.

For this guidance, we received invaluable insights and deep technical review from NGOs and other experts on biodiversity and land, including: Conservation International (Dr. Alex Zvoleff, Dr. Jordan E. Rogan, Susan Mathew, Nicole Flores); Science Based Targets Network (Dr. Varsha Vijay, Samantha McCraine, Oscar Sabag); The Nature Conservancy; World Resources Institute (Timothy Searchinger, Jessica Zionts, Clara Cho); The Biodiversity Consultancy (Leon Bennun, Katie Fensome, Graham Prescott, Malcolm Starkey); United Nations Environment Programme World Conservation Monitoring Centre (Sharon Brooks, Samantha Hill, Michelle Harrison, Alena Cierna, Sarah Fadika and Maria Julia Oliva); and World Wildlife Fund (Cristóbal Loyola, Amelia Meyer, Allen Townsend, Alice Thomas-Smyth). Finally, Elise Mazur, Michelle Sims, Liz Goldman, Martina Schneider, and Fred Stolle from WRI's Land and Carbon Lab facilitated the technical development of the SBTN Natural Lands Map and its technical documentation in collaboration with World Wildlife Fund and the Food and Land Use Coalition/Systemiq.

We also convened experts from the following organizations in support of the technical development of these methods: The Accountability Framework Initiative (Rainforest Alliance: Leah Samberg); ISEAL (Patrick Mallet); Tropical Forest Alliance

(Leony Aurora); CDP (Norma Pedroza, David Kosciulek); Rainforest Alliance (Marie Valee); Proforest (Target 1: Jane Lino; Target 3: Tharic Galuchi, Mike Senior, Veronique Bovee). We are grateful for their time and insights.

Throughout the development and consultation process we received active input from a broad range of stakeholders. These dedicated experts from industry, academia, and NGOs provided detailed input during the planning phase and on various drafts of the guidance and tools. An internal consultation took place in December 2022 and January 2023, followed by a public consultation in February and March 2023 to acquire a wider range of input on key methodological choices from all stakeholders. Following the launch of Version 0.3, these methods were provided to the Initial Target Validation Group and were tested as part of these corporate pilots between May 2023 and March 2024. We are grateful for all the contributions of time and expertise to improve this version of the Land science-based targets. We would specifically like to acknowledge the support of the SBTN Land Hub's Critical Perspectives Review Committee, chaired by Dr. Adriana Molina Garzon; the expert technical review of the methods from the Expert Review Panel including Dr. Samuel Partey (United Nations Educational, Scientific and Cultural Organization), Dr. Ariane de Bremond (Future Earth), and Dr. Gwen Iacona and Dr. Leah Gerber (Arizona State University); and the support of Jess McGlyn and Sarah Bausmith and the SBTN Corporate Engagement Program members who represent companies from most major sectors.

Special thanks to the pilot validation team (2023-2024) that helped test the beta land methods and validation requirements: Ellen Mann, Benjamin Gray, Benjamin Shepherd, Kathryn Oldfield, Paola Delgado Luna, Stefan Jimenez-Wisler.

Finally, we would like to acknowledge the leadership of SBTN's Executive Director, Erin Billman; the SBTN Council; the SBTN Product Development Council; and the guidance and support of the Network Hub's Technical Team under the direction of Dr. Varsha Vijay, including Technical Coordinator Samantha McCraine, Oscar Sabag, Erin O'Grady, Jess McGlyn, Arabella Stickels, Sarah Bausmith, Amanda Hyman, and Anna Pieper as well as the program support team to the Network Hub from Boston Consulting Group including David Little, Belinda Hu, Vincent Lequin, Lucyann Murray, Emma Pearson, Adrien Portafaix, and Hubert Remillard.

PRIMARY AUTHORS

Marco Daldoss Pirri [A], Craig R. Beatty [B], Alessandro Passaro [A], Richard Waite [C], Leah Samberg [D], Scarlett Benson [A], and Martha Stevenson [B].

[A] *Systemiq,*
[B] *World Wildlife Fund,*
[C] *World Resources Institute,*
[D] *Rainforest Alliance*

ATTRIBUTION

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Science Based Targets Network (2024). Step 3: Measure, Set, & Disclose: Land (Version 1.0)

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1. The scope of this guidance is confined to SBTN Step 3: Measure, Set, & Disclose of the five-step SBTN Framework. Step 4: Act and Step 5: Track will be addressed in later versions of SBTN's guidance.
2. This is guidance to direct voluntary corporate actions in line with company commitments to science-based targets for nature and is not a regulatory framework.
3. The guidance document is written in technical language; the primary audience of this document should have the technical knowledge necessary to engage with this content. A more condensed version of this guidance is published as part of SBTN's Corporate Manual.

Foreword

Land underpins human and non-human life through the provision of habitats and ecosystem services such as climate regulation, oxygen production, water filtration, fiber, and food production. It is one of our most precious resources and yet population growth and rising consumption are placing it under increasing pressure, weakening both human and planetary health. In the last six decades alone, we have converted almost a third of the global land area for crop and livestock production, forestry, and other human land uses such as mining and infrastructure.

How we use land is not only unsustainable, but also inefficient and unequal. Approximately one third of land is degraded to some extent, meaning that it is depleted of natural resources such as soil fertility, water, and biodiversity. Land degradation has significant economic costs and undermines food security across the world. The European Commission estimates that soil erosion costs European countries €1.25 billion in agricultural productivity loss and €155 million in gross domestic product (GDP) loss each year.

The transformation of land systems is a pre-requisite for addressing the climate and nature crises and delivering on the Sustainable Development Goals. And yet the scale of the challenge is immense. We must prevent any further destruction of natural ecosystems. We must free up hundreds of millions of hectares of land so that it can be restored to a natural state. And we must do this all while supporting the needs of a growing human population, notably, ensuring access to affordable and nutritious food.

On the face of it there is a trade-off. How can we possibly produce more food, on less land, without unsustainable forms of agricultural intensification (such as overuse of fertilizers and chemical inputs) that further degrade land and reduce its productivity in the long term?

Science tells us that it is both possible and necessary. We do not have a choice between protecting the environment or human wellbeing. The two can and must go together. This means changing how we produce and how we consume natural resources to deliver human needs. It means investing in innovation and supporting the transition toward productive practices that regenerate rather than deplete land. It means shifting toward healthier, more sustainable and less-land-intensive diets. And it means reducing food loss and waste across value chains and developing systems and infrastructure for more circular use of natural resources. We cannot achieve this without urgent deployment of the full toolkit of measures.

In my time as European Commissioner for the Environment, I championed the package on the circular economy. It was and remains my strong belief that by changing the way we produce and consume, and by delivering human needs in the most energy- and resource-efficient way, we can build our resilience and competitiveness in the global economy and can thereby promote wellbeing and create jobs.

In my current role as the co-chair of the International Resource Panel, I lead a scientific panel of experts that aims to help nations use natural resources sustainably without compromising human wellbeing and prosperity. Land is where the limits are most obvious and visible, best summarized by Mark Twain saying "*Buy land, they're not making it anymore.*" The mission of the Science Based Targets Network is therefore close to my heart. The Science Based Targets Network's first set of Land targets represent a leap forward for corporate accountability and action on nature. The three Land targets get to the heart of the challenge that we face and provide a north star for leading companies as they embark upon this transformation journey.

Given the inherent complexity of land use decision-making and management, the diversity of stakeholders, and the immensely high stakes, it is critical that the transformation of land systems is underpinned by social and environmental safeguards and strong global, national, and local governance. Corporate voluntary action on nature must not be seen as a replacement for policy action, and I therefore urge companies setting science-based targets for land to complement action on the ground with a progressive approach to advocacy in support of nature-positive policy.

We need to find new ways of doing things, to think outside the box, and promote innovation at all levels; to do this we need the broadest collective of stakeholders to come together for the common cause. We need to ensure our policies and regulations enable and encourage innovative change, removing any entrenched barriers. This is no easy task, and the scale of the challenge calls for an abundance of courage, humility, innovation, and leadership.

Janez Potočnik, *co-chair of the International Resource Panel and former European Commissioner for Environment, Oceans and Fisheries.*

Executive summary

This version of SBTN's Step 3 Land guidance will allow companies to set science-based targets for land and to align their commitments to nature with the necessary speed and scale of action as determined by science. Land use and land use change continues to be one of the most persistent threats to nature and climate. It undermines land's contributions to people, business, economies, and societies.

The targets set forth here are the next step in voluntary corporate accountability for impacts and dependencies on land and represent the SBTN collaborative partnership, which spans business, industry associations, academia, research institutes, intergovernmental organizations, non-governmental organizations, and the breadth of diverse views and perspectives represented by these groups.

The three Land targets work together to:

- avoid the loss of nature in land systems by addressing land conversion and the main driver of biodiversity loss in land;
- reduce the production pressure of large agricultural areas whose expansion and ongoing impact has far exceeded the resilient capacity of the natural ecosystems on which these human systems rely; and
- cast company actions into landscape contexts that will improve the ecological and social conditions of the landscapes in which companies operate and/or from where they source.

The land targets are

applicable to any company that determines it has material impacts on the main pressures to nature through land from its operations or supply chain. Within land systems, the targets are used to operationalize and define a consistent path for companies that will align their commitments and actions with what nature needs:

- **Target 1: No Conversion of Natural Ecosystems** avoids one of the primary drivers of biodiversity loss and sources of greenhouse gas emissions.
- **Target 2: Land Footprint Reduction** reduces one of the most globally persistent and highly degrading processes that impacts biodiversity, climate, and land.
- **Target 3: Landscape Engagement** puts company action and effort within the context of collaborative stakeholder groups at the landscape scale to regenerate working lands, restore degraded or converted ecosystems, and transform the ways that they act in, and source from, landscapes.

Nature does not yet have a recognized and functional global assessment framework, such as the Greenhouse Gas Protocol. Assessing company impacts on land and determining quantifiable targets for land systems and biodiversity is a scientific pursuit that is relatively new and still dynamic. Ultimately, the SBTN Land Hub will provide spatially explicit, place-based thresholds for what nature needs in different places. This science will be the backbone of the next version of science-based targets for land.

In developing the current targets, the organizations that represent the SBTN Land Hub (World Wildlife Fund, Conservation International, World Resources Institute, The Nature Conservancy, and the Food and Land Use Coalition) have balanced the ambition of science-based targets for nature, the availability of science to support Land targets, and the feasibility of companies to comply with

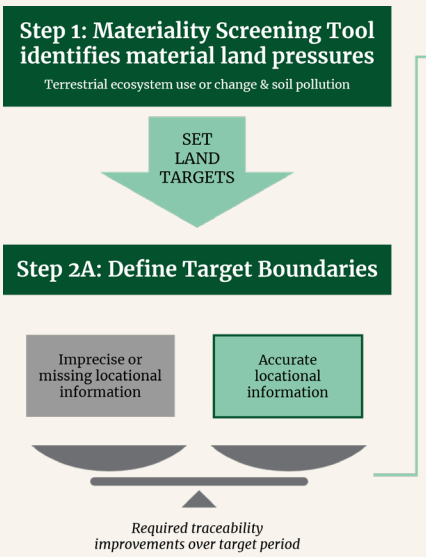
target requirements across all sectors. This has required a reliance on several ongoing corporate sustainability initiatives, including the long-standing work on deforestation and conversion-free commodities through the Accountability Framework Initiative as well as corporate commitments to emissions reductions under the Science Based Targets initiative for Climate, both of which root the SBTN Land targets in ongoing work within companies.

However, Land targets, as a voluntary corporate initiative may accelerate the ambition of these processes both by elevating nature to pair with corporate climate objectives and uniting company actions across multiple landscapes, communities, and natural realms. Version 1.0 of the Land targets is designed to incentivize corporate actions that will align with the delivery of the next generation of Land targets, and nature cannot wait.

Setting land targets

In assessing their materiality to pressures on land, companies that identify terrestrial ecosystem use or change OR soil pollution as material during their SBTN Step 1 assessment must set Land targets. The conditions around which of the three Land targets must be set and the required target dates will depend on the unique qualities and composition of each company. It is required that companies work on all targets for which they are responsible, simultaneously, though target dates may differ among or within the three targets.

Regardless of whether a company identifies one or both of *terrestrial ecosystem use or change* OR *soil pollution*, the Landscape Engagement target will apply. In either case a company will need to follow the target guidance for how to engage and contribute to 1–2 materially relevant landscape initiatives that cover an estimated 10% of their land footprint in the first 1–2 years.



Step 2B: Interpret and Rank
Calculate pressure-specific index values
Evaluate state of nature

Step 2C: Prioritize

Step 3: Measure, Set, & Disclose targets

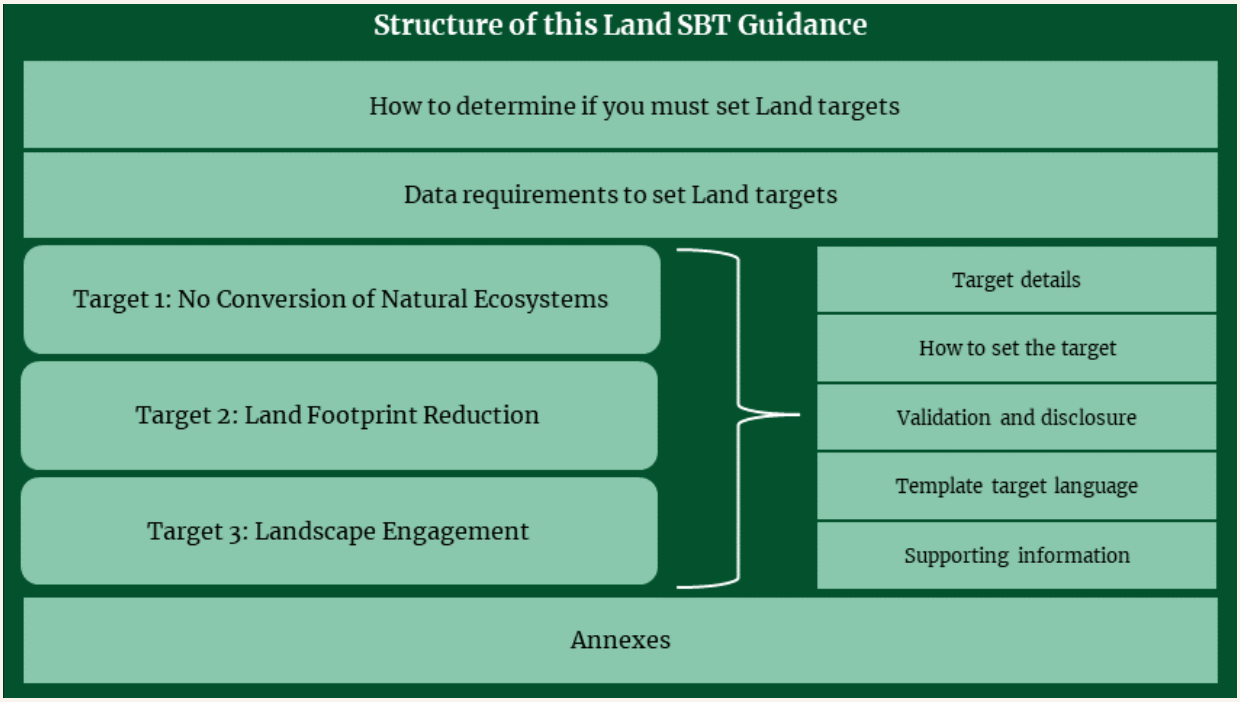
	No Conversion of Natural Ecosystems	Land Footprint Reduction	Landscape Engagement
Applies to:	Conversion-driving and high land use emission companies	Large agricultural companies	All companies with material pressures on land
Target Result	Conservation of natural land and ecosystems	Reduction in pressures on land from large companies	Engagement in materially relevant, cooperative landscape initiatives to improve ecological and social condition
Timeframe and Coverage	Highly dependent on sector and position in value chain. Spans 2025 to 2030.	Allocated based on 500mha reduction by 2050 with incremental targets to 2030	Start with +/- 10% coverage of company land footprint and increase coverage by 2030

The Land Footprint Reduction target applies only to large agricultural companies at this stage—primarily due to data constraints, but also due to their outsized impact on nature. It asks companies to reduce their absolute land footprint or intensity of existing footprint in line with the global estimated agricultural land reduction that is required to meet global nature, climate, and Sustainable Development Goals, totaling 500 million hectares by 2050.

The No Conversion of Natural Ecosystems target includes the greatest diversity of potential options for a Land target due to the differentiation of the target based on value chain position, the sourcing of conversion-driving commodities, and the geographic origin of the commodities.

How to use this document

This guidance is structured to present the Land targets and the conditions and data requirements around setting them upfront. It prioritizes the details that will be most relevant for companies looking to understand the target requirements, data needs, and key exceptions. Readers should familiarize themselves with the detail and rationale around the targets and can find this necessary information and guidance in the target-specific annexes, associated technical documents, and supplementary materials listed throughout this guidance.



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Glossary of terms and acronyms

AFi
Accountability Framework initiative.

Agricultural land
Cropland and land under permanent meadows and pastures.

Allocation
Assignment of a given company's portion of effort toward issue/impact mitigation.

AR3T
SBTN's Action Framework is named AR3T because it covers actions to avoid future impacts, reduce current impacts, regenerate and restore ecosystems, and transform the systems in which companies are embedded.

Avoid
Prevent impact happening in the first place, eliminate impact entirely.

Bare land
Areas with exposed rock, soil, or sand with less than 10% vegetated cover.

Baseline
Value of impacts (on nature) or state (of nature) against which an actor's targets are assessed, in a particular previous year.

Biodiversity
The variability among living organisms from all sources, including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems. (Convention on Biological Diversity (CBD) 1992, Article 2)

CBD
Convention on Biological Diversity.

Composition of an ecosystem
This refers to the biotic constitution of ecosystems—the pattern of the makeup of species communities and the interactions between them. It refers to the identity and variety of life.

Conversion
A change of a natural ecosystem to another land use or a profound change in a natural ecosystem's species composition, structure, or function. Deforestation is one form of conversion (conversion of natural forests). Conversion includes severe degradation or the introduction of management practices that result in substantial and sustained change in the ecosystem's former species composition, structure, or function. Change to natural ecosystems that meets this definition is considered to be conversion regardless of whether or not it is legal.

Conversion hotspots
Subnational jurisdictions where pressures on land have resulted in accelerated conversion of natural land classes to non-natural land classes between 2000-2020.

Core natural lands
Places with acknowledged ecological importance that require immediate action to prevent conversion due to:

- Critical habitat
- Key Biodiversity Areas of extinction/collapse risk, irreplaceability, or natural uniqueness.
- Protected areas (all categories

Cutoff dates
The cutoff date provides a baseline for the target. After this date, any conversion of natural ecosystems on a given site renders the materials produced on that site non-compliant with a No Conversion target.

Degradation
Changes within a natural ecosystem that significantly and negatively affect its species composition, structure, and/or function and reduce the ecosystem's capacity to supply products, support biodiversity, and/or deliver ecosystem services. Degradation may be considered conversion if it is large-scale and progressive or enduring; alters ecosystem composition, structure, and function to the extent that regeneration to a previous state is unlikely; or leads to a change in land use (e.g., to agriculture or other use that is not a natural forest or other natural ecosystem). (AFi)

Direct operations
All activities and sites (e.g., buildings, farms, mines, retail stores) over which the enterprise has operational or financial control. This includes majority-owned subsidiaries.

Downstream
This covers all activities that are linked to the sale of products and services produced by the company setting targets. This includes the use and re-use of the product and its end of life to include recovery, recycling, and final disposal.

DPSIR Causal Framework
Describes causal relationships in social-ecological systems between driver (D), pressure (P), state (S), impact (I), and response (R) indicators.

Ecological/habitat connectivity
The degree to which the landscape facilitates the movement of organisms (animals, plant reproductive structures, pollen, pollinators, spores, etc.) and other environmentally important resources (e.g., nutrients and moisture) between similar habitats. Connectivity is hampered by fragmentation. (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), 2019)

Ecosystem
A dynamic complex of plant, animal, and microorganism communities and the non-living environment interacting as a functional unit. Within this definition, the term "unit" relies on the identification of a distinct function as well as a "dynamic" grouping of biotic and abiotic factors. When using an ecosystem approach to conservation, the CBD suggests an ecosystem can refer to any functioning unit, regardless of scale. Thus, the term is not necessarily synonymous with "biome" or "ecological zone" and is better determined by the problem that is being addressed.

Ecosystem condition
The quality of an ecosystem measured by its abiotic and biotic characteristics. Condition is assessed by an ecosystem's composition, structure, and function, which, in turn, underpins the ecological integrity of the ecosystem and supports its capacity to supply ecosystem services on an ongoing basis. (UN System of Environmental Economic Accounting (SEEA), 2021—Ecosystem Accounting: Final Draft)

Ecosystem function
The flow of energy and materials through the biotic and abiotic components of an ecosystem. This includes many processes such as biomass production, trophic transfer through plants and animals, nutrient cycling, water dynamics, and heat transfer. (IPBES, 2019)

Ecosystem integrity
Ecosystem integrity encompasses the full complexity of an ecosystem, including the physical, biological, and functional components, together with their interactions, and is measured against a "natural" (i.e., current potential) reference level. It is the extent to which the composition, structure, and function of an ecosystem fall within their natural range of variation.

Embedded or highly transformed commodities
Volumes of high-impact commodities that are integrated into complex products. In this case, companies do not purchase a commodity in its raw or processed forms, but they purchase a product that contains them.

FLAG
The Forest, Land and Agriculture (FLAG) Guidance of the Science Based Targets initiative.

FOLU
Food and Land Use Coalition.

Forests
Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or other land use. (Food and Agriculture Organization (FAO))

Free, prior and informed consent
Free, prior, and informed consent (FPIC) is a specific right that pertains to Indigenous Peoples and is recognized in the United Nations Declaration on the Rights of Indigenous Peoples. FPIC is a mechanism that safeguards the individual and collective rights of Indigenous and tribal peoples, including their land and resource rights and their right to self-determination. The minimum conditions that are required to secure consent include that it is "free" from all forms of coercion, undue influence, or pressure, that it is provided "prior" to a decision or action being taken that affects individual and collective human rights, and that it is offered on the basis that affected peoples are "informed" of their rights and the impacts of decisions or actions on those rights. FPIC is considered to be an ongoing process of negotiation, subject to an initial consent. To obtain FPIC, "consent" must be secured through an agreed process of good faith consultation and cooperation with Indigenous and tribal peoples through their own representative institutions. The process should be grounded in a recognition that the Indigenous or tribal peoples are customary landowners. FPIC is not only a question of process, but also of outcome, and is obtained when terms are fully respectful of land, resource, and other implicated rights. (FAO (2016): Free Prior and Informed Consent - An Indigenous Peoples' Right and a good practice for local communities)

GBF
Final Kunming–Montreal Global Biodiversity Framework.

GHGP
Greenhouse Gas Protocol.

Goal
In global (e.g., UN) sustainability framings, a high-level statement of ambition, including a time frame. Example: By 2030, ensure healthy lives and promote wellbeing for all at all ages (Sustainability Development Goal (SDG) 3).

High-impact commodities
Raw and value-added materials used in economic activities that are known to have material links to the key drivers of biodiversity loss, resource depletion, and ecosystem degradation. Activities associated with high-impact commodities include: extraction of these commodities (e.g., mining, farming), clearing of lands for extraction, processing of commodities (into refined or value-added forms), manufacturing commodities into complex products (with additional inputs), distribution of commodities, and the procurement of commodities (in their raw, value-added, or final form). For more information, please see SBTN Step 1 Guidance.

IFC
International Finance Corporation.

Impacts
These can be positive or negative contributions of a company or other actor toward the state of nature, including pollution of air, water, or soil; fragmentation or disruption of ecosystems and habitats for nonhuman species; and alteration of ecosystem processes.

Impacts on nature
A change in the state of nature, which may result in changes to the capacity of nature to provide value to business and society and/or instrumental, relational, and intrinsic value. (Taskforce on Nature-Related Financial Disclosures (TNFD))

Indicator
A measurable entity related to a specific information need, such as the state of nature, change in a pressure, progress toward a target, or association between two or more variables. Example: Red List Index (SDG Target 15.5; Aichi Target 12).

ISIC
International Standard Industrial Classification of All Economic Activities.

Land cover
The observed physical and biological cover of Earth's land.

Land footprint/land occupation
A company's land footprint, known in life cycle assessment terms as "land occupation," is defined for the Land Footprint Reduction target as the amount of agricultural land required per year to produce the products produced or sourced by a company, and it is reported in hectares per year.[1] For crops, land occupation is also referred to as "harvested area" in the FAO's data portal FAOSTAT. Importantly, "land footprint" or "land occupation" for the purpose of target-setting related to Land science-based targets refers to "working lands" used to produce agricultural products in corporate supply chains—not necessarily all land owned or controlled by companies. Please note as well that "land footprint" and "land occupation" are referred to as *terrestrial ecosystem use* in the SBTN Technical Guidance for Steps 1 and 2. Terrestrial ecosystem use is one of the eight main environmental pressures that SBTN companies are required to assess in Step 1.

Land footprint intensity/land occupation intensity
Land footprint (or occupation) intensity is essentially the reciprocal of yield, referring to the amount of land needed to produce a given unit of product. The unit of product in the denominator of this calculation can vary (e.g., weight, kilocalories, protein).

1 Greenhouse Gas Protocol Land Sector and Removals Guidance, forthcoming.

Landscape
A socio-ecological system that consists of natural and/or human-modified ecosystems, and which is influenced by distinct ecological, historical, economic, and socio-cultural processes and activities. For the purpose of this guidance, the landscape is the area where a landscape approach is being implemented. In ideal cases, the landscape will have been defined through a broad stakeholder-led process in which a company may begin its participation. This may not always be the case for areas that are relevant for companies. In these cases, a more prescriptive approach to landscape identification may be required. Here it may be possible to utilize water basin boundaries identified through the SBTN Freshwater target methodology or through SBTN's Step 2: Interpret & Prioritize process.

Landscape approach
Collaboration of stakeholders within a defined natural or social geography, such as watershed, biome, or company sourcing area. This approach seeks to reconcile competing social, economic, and environmental goals through "integrated landscape management"—a multi-stakeholder approach that builds consensus across different sectors with or without government entities.

Land use
All the arrangements, activities, and inputs undertaken in a certain land-cover type (a set of human actions) or the social and economic purposes for which land is managed (e.g., grazing, timber extraction, conservation).

Land use change
Land uses can change over time due to both natural and anthropogenic causes. Such changes can be represented by land use change categories (e.g., forest land converted to cropland). Where the land use category remains the same but the land use subcategory changes, for example conversion from a primary forest (natural forest) to a plantation forest (planted forest), this should be accounted for as land use change.

Materiality
Significance of an entity's environmental impact.

Measurement
The process of collecting data for baseline setting, monitoring, and reporting.

Monitoring
Tracking progress toward targets.

Natural ecosystem[2]

An ecosystem that substantially resembles—in terms of species composition, structure, and ecological function—what would be found in a given area in the absence of major human impacts. This includes human-managed ecosystems where much of the natural species composition, structure, and ecological function are present.

Natural ecosystems include:

- largely "pristine" natural ecosystems that have not been subject to major human impacts in recent history;
- regenerated natural ecosystems that were subject to major impacts in the past (for instance by agriculture, livestock raising, tree plantations, or intensive logging) but where the main causes of impact have ceased or greatly diminished and the ecosystem has attained species composition, structure, and ecological function similar to prior or other contemporary natural ecosystems;
- managed natural ecosystems (including many ecosystems that could be referred to as "semi-natural") where much of the ecosystem's composition, structure, and ecological function are present—this includes managed natural forests as well as native grasslands or rangelands that are, or have historically been, grazed by livestock;
- natural ecosystems that have been partially degraded by anthropogenic or natural causes (e.g., harvesting, fire, climate change, invasive species, or others) but where the land has not been converted to another use and where much of the ecosystem's composition, structure, and ecological function remain present or are expected to regenerate naturally or by management for ecological restoration.

Natural forests

Natural forests possess many or most of the characteristics of a forest native to the given site, including species composition, structure, and ecological function.

Nature's contributions to people (NCPs—also known as "ecosystem services")

All the beneficial and detrimental contributions that we obtain from and with nature (IPBES Global Assessment: 26). In general, NCPs are categorized as material NCPs (e.g., wild-harvested foods), regulating NCPs that govern biophysical processes (e.g., carbon storage, flood regulation), and non-material NCPs that provide cultural services.

In total, the different categories of NCP recognized by IPBES are: habitat creation and maintenance (NCP 1); pollination and dispersal of seeds and other propagules (NCP 2); regulation of air quality (NCP 3); regulation of climate (NCP 4); regulation of ocean acidification (NCP 5); regulation of freshwater quantity, location, and timing (NCP 6); regulation of freshwater and coastal water quality (NCP 7); formation, protection, and decontamination of soils and sediments (NCP 8); regulation of hazards and extreme events (NCP 9); regulation of detrimental organisms and biological processes (NCP 10); energy (NCP 11); food and feed (NCP 12); materials, companionship, and labor (NCP 13); medicinal, biochemical, and genetic resources (NCP 14); learning and inspiration (NCP 15); physical and psychological experiences (NCP 16); supporting identities (NCP 17); maintenance of options (NCP 18).

Nature loss

The loss and/or decline of the state of nature.

Nature positive

A high-level goal and concept describing a future state of nature (e.g., biodiversity, nature's contributions to people) that is greater than the current state.

Pressures

A human activity that directly or indirectly degrades nature. According to IPBES, five key pressures contribute most to the loss of nature globally: land and sea use change; direct exploitation of organisms; climate change; pollution; and invasion of alien species. While we generally follow IPBES definitions for these categories, we take a slightly broader conceptualization of "direct exploitation" to include both biotic and abiotic resources, such as water use—we thus use the term "resource exploitation."

Primary data

Data collected specifically for the assessment being undertaken. Generally, primary data will be collected from site-level measurement on a specific issue area through the use of direct measurement (e.g., volume of freshwater used for irrigation each month).

Production unit

A plantation, farm, ranch, or forest management unit, or production site. This includes all plots used for agriculture or forestry that are under one management, located in the same general area, and share the same means of production. It also includes natural ecosystems, infrastructure, and other land within or associated with the plantation, farm, ranch, site, or forest management unit. (Adapted from AFi)

Reduce

Minimize impacts, from a previous baseline value, without eliminating them entirely.

Regenerate[3]

Actions designed within existing land uses to increase the biophysical function and/or ecological productivity of an ecosystem or its components, often with a focus on specific

2 https://accountability-framework.org/the-framework/contents/definitions/

3 https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/09/SBTN-initial-guidance-for-business.pdf

nature's contributions to people (e.g., on carbon sequestration, food production, and increased nitrogen and phosphorus retention in regenerative agriculture). (Adapted from FOLU, 2019[4])

Reporting
Preparing of a formal written document typically connected to desired objectives, outcomes, or outputs, such as those connected to targets and goals.

Restore[5]
Initiate or accelerate the recovery of an ecosystem with respect to its health, integrity, and sustainability with a focus on permanent changes in state. (Adapted from the Society of Ecological Restoration[6])

SBTi
Science Based Targets initiative.

SBTN
Science Based Targets Network.

Science-based targets
Measurable, actionable, and time-bound objectives, based on the best available science, that allow actors to align with Earth's limits and societal sustainability goals.

Secondary data
Data that was originally collected and published for another purpose or a different assessment, e.g., derived from modelled or proxy-level data.

Short vegetation
Areas of land with vegetation shorter than 5 meters, and can include areas of land dominated by grass or shrubs.

Site(s)
Operational locations within a company's value chain/spheres of control and influence (including direct operations). Sites can include operations from any phase of a product's life cycle, from extractive operations (e.g., mines), material processing (e.g., mills), production facilities (e.g., factories), logistics facilities (e.g., warehouses), wholesale and retail (e.g., stores), and recycling/end of life (e.g., material recovery).

Snow/ice
Areas covered by permanent snow or ice.

Stakeholder engagement
Stakeholder engagement involves interactive processes of engagement with relevant stakeholders through, for example, meetings, hearings, or consultation proceedings. Effective stakeholder engagement is characterized by two-way communication and depends on the good faith of the participants on both sides. (TNFD)

Stakeholders
Stakeholders are persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. (TNFD)

State of nature indicators
State of nature indicators describe the general conditions of nature in physical, chemical, or biological terms. These change in response to pressures. Throughout the target-setting methodology, SBTN utilizes the DPSIR causal framework. Important state indicators in the SBTN methods include water availability, terrestrial ecosystem intactness, net primary productivity, soil organic carbon content, water quality, and ecosystem extent or connectivity.[7]

States
Unless otherwise specified, we use the term "state" to mean "state of nature" in three key categories: species (abundance and extinction risk), ecosystems (extent, integrity, and connectivity), and nature's contributions to people.

Structure of an ecosystem
This comprises the three-dimensional aspect of ecosystems—the biotic and abiotic elements that form the heterogeneous matrix supporting the composition and functioning. Structure is dependent on habitat area, intactness, and fragmentation.

Target
In global (e.g., UN) sustainability framings, a more specific quantitative objective, usually nested under a goal, with defined measurement and an associated indicator. Example: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity (Aichi Target 8).

Target boundary
The corporate scope of the target, specific to each issue area. The target boundary may be defined in terms of the value chain aspect covered, as well as the specific locations, products, brands, etc., that will be in focus in a given time period.

Target dates
Target dates are the time by which companies must achieve their Land targets.

Threatened ecosystems
Ecosystems that are classified as threatened by International Union for Conservation of Nature (IUCN) Red List of Ecosystems. This includes "Vulnerable," "Endangered," and "Critically Endangered" ecosystems. While Red List of Ecosystem assessments are not yet global in coverage, they provide an additional buffer against the conversion of threatened ecosystems for those areas that have been assessed.

4 https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/Regenerative-Agriculture-final.pdf

5 https://sciencebasedtargetsnetwork.org/wp-content/uploads/2020/09/SBTN-initial-guidance-for-business.pdf

6 https://cdn.ymaws.com/www.ser.org/resource/resmgr/docs/standards_2nd_ed_summary.pdf

7 Terminology note: While SBTN uses the term "state" in alignment with the DPSIR framework, other initiatives, such as TNFD and the Capitals Coalition, use the term "changes in natural capital" to describe these same factors within the causal chain of environmental change.

Threshold
Level of an environmental indicator representing attainment of the desired state of nature.

Transform
Actions contributing to system-wide change, notably the drivers of nature loss, e.g., through technological, economic, institutional, and social factors and changes in underlying values and behaviors. (Adapted from the Intergovernmental Panel on Climate Change (IPCC) and IPBES 2019[8])

Upstream
This covers all activities associated with suppliers, e.g., production or cultivation, sourcing of commodities of goods, and transportation of commodities to manufacturing facilities.

Validation
An independent process involving expert review to ensure the target meets required criteria and methods of science-based targets.

Value chain
Production of "economic value" along a series of activities, sites, and entities. The value chain can be divided into three "segments": upstream, direct operations, and downstream. Each of these segments involves places where economic activities managed or relied on by the company occur. Most value chain frameworks cover a suite of activities starting with the raw materials and extending through end-of-life management, that (a) supply or add value to raw materials and intermediate products to produce final products for the marketplace and (b) are involved in the use and end-of-life management of these products.

8 https://ipbes.net/sites/default/files/Initial_scoping_transformative_change_assessment_EN.pdf

Verification
An independent third-party confirmation of either or both of: (a) baseline values of a target indicator (e.g., a company's water or GHG inventory), and (b) progress made toward achieving the target.

Water
Surface water present 20% or more of the year, outside wetlands.

Wetlands
Transitional ecosystems with saturated soil that can be inundated by water either seasonally or permanently, and can be covered by short vegetation or trees.

Working lands
Human-modified lands, which can include farms, forests, rangelands, and infrastructure, that are managed to provide goods and services.

WWF
World Wildlife Fund, or World Wide Fund for Nature.

Yield
This refers to intensity of production per unit of land area. It is defined as the amount of product produced in a year divided by the amount of land occupied by that product. For crops, it refers to the amount produced divided by the harvested area. For livestock products, it refers to the amount produced divided by the total area needed for livestock production (both to house the animals and to produce the crop- and/or pasture-based animal feeds).

About this guidance

The Science Based Targets Network (SBTN) was established to develop methods for companies and cities to set integrated targets across all Earth systems—water, land, biodiversity, ocean, and climate—building on the progress of the Science Based Targets initiative (SBTi), which enables companies to set science-based climate mitigation targets.

This guidance document represents the contribution of the individuals and representative organizations focused on **land systems** within SBTN (hereafter referred to as "SBTN Land").[9] The document forms part of SBTN's first release of science-based targets for nature—the first set of comprehensive nature targets that will raise the bar of corporate ambition on nature in line with scientific evidence on what nature needs. By using the methods in this document, companies can prepare for adoption of more comprehensive and integrated targets to be published by SBTN in due course.

This document covers:

- Why the world needs Land targets
- Target approach and alignment with existing initiatives
- The process for setting Land targets
- Guidance on each Land target.

9 SBTN Land Hub is led by World Wildlife Fund (WWF-US) and Conservation International (CI) and includes representatives from The Nature Conservancy (TNC), World Resources Institute (WRI), and the Food and Land Use Coalition (FOLU) through Systemiq.

Introduction

Introduction

The world is in the midst of a climate and nature emergency. Global mean temperatures are on track for an increase of more than 2.5˚C—far above the defined "safer upper limit" of 1.5˚C.[10,11] At the same time, our society is witnessing what scientists describe as "the sixth mass extinction since the beginning of life on Earth,"[12] with around half of the Earth's nature having been destroyed since the industrial revolution and most in less than half a century, along with the elimination of two thirds of global animal populations, including mammals, birds, fish, amphibians, and reptiles.[13]

The nature and climate crises are deeply intertwined in terms of:

- Common drivers: Human use now directly affects more than 70% of the global, ice-free land surface.[14] Land use change and direct exploitation of resources on land are the main causes of human-induced loss of nature in all terrestrial regions globally. These pressures are precursors to each of the remaining drivers, including climate change, invasive alien species, and pollution.[15]
- Interactions (both positive and negative): Biodiverse soils sequester more carbon and healthy ecosystems support climate adaptation. At the same time, climate change itself is a driver of biodiversity loss with rising temperatures resulting in species and ecosystem redistributions and extinctions.
- Solutions: Avoiding the conversion of natural ecosystems and changing the way working lands are used, while protecting and restoring nature, can halt and reverse these damaging processes while delivering multiple wins for climate mitigation, adaptation, biodiversity, and people.[16]

The importance of land and its use is supported by its inclusion as a key topic in nearly every major international global convention, assessment, and report, including those on biodiversity, desertification, climate, freshwater, and oceans.

Introducing Land targets

The aim of SBTN is to develop a methodology for science-based targets that will enable the corporate sector to align their own commitments to nature with the necessary speed and scale of action as determined by science. Science-based targets for nature—which currently cover land and freshwater systems and key components of their biodiversity—are an important step toward achieving this goal.

This document focuses on explaining the methodology to set science-based targets for land. Throughout this document, the terms "Land science-based targets" and "Land targets" are also used to refer to the methodology.

10 Olhoff, A., & Christensen, J. M. (2020). Emissions gap report 2020.

11 IPCC, 2018: Global Warming of 1.5°C.An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

12 Ceballos, G., P. Ehrlich, and R. Dirzo. (2017). Population losses and the sixth mass extinction. Proceedings of the National Academy of Sciences, 114(30), E6089-E6096; DOI:10.1073/pnas.1704949114

13 WWF (2020) Living Planet Report 2020 - Bending the curve of biodiversity loss. Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland.

14 IPCC, 2019: Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. https://doi.org/10.1017/9781009157988.001

15 Jaureguiberry, P. et al. (2022). The direct drivers of recent global anthropogenic biodiversity loss. Science Advances, 8(45), eabm9982.

16 Vijay, V., J. R. Fisher, & P. R. Armsworth. (2022). Co-benefits for terrestrial biodiversity and ecosystem services available from contrasting land protection policies in the contiguous United States. Conservation Letters, 15(5), e12907.

Table 1: Science-based targets for land.

SCIENCE-BASED TARGETS FOR LAND*	
Target 1	No Conversion of Natural Ecosystems
Target 2	Land Footprint Reduction
Target 3	Landscape Engagement

* SBTN Land has complemented the three Land targets with a requirement for Forest, Land and Agriculture (FLAG) companies to set a sister target on land greenhouse gas (GHG) emissions following the SBTi FLAG methodology requirements (note: for companies required to set climate targets as per FLAG's guidance).

Version 1 of the methodology for Land science-based targets comprises three distinct targets, which are shown in Table 1. Companies should adopt these targets depending on the materiality of pressures generated by the company's activities, as well as the sector, size, and land footprint of the company (see section ii, "Data requirements to set Land targets"). Final validation of Land targets requires that companies must set all Land targets that are identified as material in Step 1. Companies may not omit a Land target from their commitment to SBTN if it is identified as material.

The Land targets are designed to work together to incentivize the most important actions needed to achieve nature goals in land systems: halting conversion of natural ecosystems (Target 1), freeing up agricultural land for increased ecological productivity (Target 2), and improving the ecological and social condition of landscapes, including working lands, to enhance ecosystem structure, composition, and function and the social systems that depend on such landscapes (Target 3). As such, this methodology lays out not only how to set targets (what parts of the business to manage, what metrics to use, and what changes need to be seen over what time periods) but also provides companies with prescriptive guidance at a high level on how to contribute toward enhancement and protection of land and terrestrial biodiversity.

In particular, the Landscape Engagement target (Target 3) works to ensure that companies appropriately balance the need to use land more efficiently while avoiding unsustainable forms of agricultural intensification (e.g., overuse of fertilizers and chemical inputs, irrigation practices that deplete freshwater resources) and building resilience through the restoration of ecosystems and within working lands. It also provides a vehicle to guide the implementation of the other two Land targets through landscape-level engagement.

The three Land targets have been developed according to their capacity to address the following criteria:

- Maximum coverage of pressures that are responsible for most companies' impacts on land.
- Availability of quantifiable and measurable metrics that can be feasibly impacted by company activities to make progress against the target.
- Alignment with active and relevant corporate sustainability standards and initiatives.
- Ability to incentivize action across SBTN's AR3T mitigation hierarchy.

The targets are built with the information and data that are currently available. They allow companies to set targets today that will enable quantifiable contributions at the company and landscape level. They are designed to increase the clarity, ambition, and/or scope of existing initiatives that, despite intent, have not yet led to the transformational changes required to address climate change and nature loss at a global scale.

These targets complement climate science-based targets by addressing many of the impacts that climate targets cannot, incentivizing actions related to wider, non-GHG impacts on land. The broader set of actions these

methods incentivize include the reduction and treatment of pollution and effluents, reduced pesticide use, erosion control, and other actions that promote biodiversity and ecosystem integrity that may not be captured by corporate actions that prioritize carbon sequestration.

Critically, these methods expand the focus beyond forests to include all natural, terrestrial ecosystems (e.g., grasslands, wetlands, shrublands), especially as they relate to the worked lands (e.g., cropland, rangeland, pasture, managed forest) that facilitate the production of many goods used by companies and consumers.

Moreover, while firmly rooted in directing companies to assess, avoid, or mitigate their impacts on nature, Land targets will go further by incentivizing companies to deliver on regenerative, restorative, and transformative actions in collaboration with multiple stakeholders at the landscape scale—including actions that underpin broader issues of sustainable development and are in line with a nature-positive future.

This version of the Land methods will enable such action at scale from companies. The world cannot wait for the changes called for in these methods. However, companies should note that as land system science and methods for accounting for impacts and dependencies on nature progress, SBTN will ultimately revise Version 1.0 of the science-based targets for land to keep pace with sustainability science. The ambition of the SBTN Land Hub is for future versions of Land targets to reflect what nature needs at a place-based level, based on regionally defined and spatially explicit thresholds. This future version will also cover a broader range of material land indicators.

Companies can be confident that there will be consistency between different versions of the Land targets. Most importantly, this Version 1 of the Land targets is designed to incentivize corporate actions that will align with the delivery of the next generation of Land targets, and the data that companies will collect and analyze for setting targets using these methods will be directly relevant as Land targets evolve with the developing science in subsequent versions.

Box 1: SBTN biodiversity target-setting methods.

Land conversion is the most acute and chronic pressure facing terrestrial biodiversity and these targets, through addressing commodity-driven conversion of natural ecosystems while also incentivizing ecosystem restoration help to address the main driver of terrestrial biodiversity loss. SBTN is also committed to developing more complete biodiversity coverage in the subsequent releases of target-setting methods. This includes addressing pressures on biodiversity not currently included in the Step 3 methods for land and freshwater as well as the inclusion of other biodiversity target indicators to more comprehensively address dimensions of biodiversity loss, where possible. The targets proposed in this document explicitly consider biodiversity themselves (including through prioritizing actions on science-based targets in locations where they will have the most impact on mitigating biodiversity loss in line with Steps 1 and 2) and demonstrate alignment with goals and targets outlined in the Convention on Biological Diversity (see supplementary material). They also reflect many of the foundational ways that companies can interact with and consider biodiversity in their operations and value chains through land and freshwater materiality.

i. How to determine if your company must set Land targets

Setting Land targets is part of the five-step process for setting science-based targets for nature. Before using the Step 3 Land methods, companies must complete Step 1: Assess and Step 2: Interpret & Prioritize. These steps of the SBTN target-setting process enable companies to determine which pressures on nature they must address with targets, and which parts and locations of their business may represent the highest priority starting point.

Companies will be required to commit to the three Land targets depending on a combination of:

1. Their material pressures on terrestrial ecosystem use and change or soil pollution as determined by using the Step 1 guidance from SBTN.
2. The company's designated sector(s), as defined by the International Standard Industrial Classification of All Economic Activities (ISIC).
3. The size of the company as measured by full-time equivalent employees (Land Footprint Reduction target only).
4. The company's GHG emissions and/or land footprint (No Conversion of Natural Ecosystems and Land Footprint Reduction targets only).

Depending on these criteria, each target will be one of the following:

a. Required
b. Recommended
c. Not required

Companies must address the applicability of each Land target independently. Each target section in this guidance displays these requirements and provides more details around their scope across direct operations, and sourcing from different stages of the value chain.

Companies that meet the materiality thresholds for land pressures in SBTN Step 1: Assess can understand which Land targets are required, recommended, not required based on their ISIC sector(s). For cross-referencing the major sector classification systems, please refer to the crosswalk sector classification guidance in the supplementary material.

To have Land targets validated, companies will need to meet the requirements under each of the targets for which they are responsible. Companies that are unable to meet these requirements will not be able to validate nor make claims on science-based targets for land.

Table 2: Pressure categories covered by science-based targets for nature, from SBTN Step 1

IPBES Pressure Category	SBTN Pressure Category
Ecosystem use or change	**Terrestrial ecosystem use or change***
	Freshwater ecosystem use or change
	Marine ecosystem use or change
Resource exploitation	Water use
	Other resource use (minerals, fish, other animals, etc.)
Climate change	GHG emissions
Pollution	Non-GHG air pollutants
	Water pollutants
	Soil pollutants*

Pressures in bold and marked with a * are those covered in the science-based targets for land methods. Companies that have material contributions to these, as identified in Step 1, will be required to set and validate targets to make claims about science-based targets for land. IPBES stands for the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

The sector requirements in this document (Figures 1 and 2) represent the SBTN Land Hub's interpretation of the materiality screening results from Step 1. In these figures, targets are highlighted as required if this is the case for either the company's direct operations or upstream activities. Using these figures, companies can determine, based on their sector, which Land targets they are required to set. However, that determination must be consistent with Steps 1 and 2, aligned with the information introduced in Step 1b and reflective of the target boundary and prioritization determined in Step 2.

In their target boundary, companies must include any activities within their organizational scope (upstream and direct operations) that emerge as material for terrestrial ecosystem use or change in Step 1a (materiality screening). This includes all land holdings and all raw material included in the Step 1 high-impact commodity list and Annex 1 conversion-driving commodity list of this document. In Step 2, all these activities, qualified as material in Step 1a, will be defined as the target boundaries for terrestrial ecosystem use or change. Please keep in mind that for Target 1—No Conversion of Natural Ecosystems—the entire target boundary for terrestrial ecosystem use or change must be included. The company-specific impacts relative to each pressure category within the current scope of science-based targets for nature must be reflected in the extent of their requirements for setting and validating targets.

Please note that because the tools used for the Step 1a materiality screening are based on global sectoral performance, some companies may find that they have lower contributions to pressures than would require them to set science-based targets for land. In these cases, companies will be required to submit a rationale to SBTN to justify the exclusion of activities from the scope of their targets.

MANDATORY ALIGNMENT WITH CLIMATE TARGETS

Climate and nature goals can, and must, be achieved holistically. As a result, SBTN *requires* companies that are required to set Land targets to complement those targets with a target on land-based GHG emissions and removals following the SBTi forest, land, and agriculture (FLAG) methodology requirements (see SBTi FLAG). Therefore, a company that wants to set Land targets must also be committed to emissions reductions through SBTi should they qualify based on SBTi guidance (see Box 2).

Correspondingly, companies required by SBTi to set FLAG climate targets are required by SBTN to set a No Conversion of Natural Ecosystems target and a Land Footprint Reduction target (in this case, if they meet the company size requirement).

Box 2: SBTi requirements for setting a FLAG target.

SBTi requirements for setting a FLAG target. Companies that meet these requirements must also set a No Conversion of Natural Ecosystems target under SBTN:

I. Companies from the following SBTi-designated sectors:
   a. Forest and paper products (forestry, timber, and paper)
   b. Food production (agricultural production)
   c. Food production (animal source)
   d. Food and beverage processing
   e. Food and staples retailing
   f. Tobacco

II. Companies in any other sector with FLAG-related emissions that total more than 20% of overall emissions across scopes. The 20% threshold should be accounted for as gross emissions, not net (gross minus removals).

How to determine if your company must set Target 1: No Conversion of Natural Ecosystems

The No Conversion of Natural Ecosystems target is **consistent with existing zero deforestation commitments set within the soft commodity supply chains** of companies and consistent with the Accountability Framework initiative (AFi) guidance.

There are two criteria that companies should assess to understand if they are ***required*** to set this target:

1. Terrestrial ecosystem use or change is material according to Step 1's materiality screening; OR

2. 20% or more of their GHG emissions come from a sector that has land sector activities (e.g., agriculture, forestry, and other land use (AFOLU) emissions.

Additionally, for specific sectors including metals, infrastructure, construction, and extractives (MICE) (see Figure 1 for full list), the No Conversion target is required but applies only to "critical habitat" or "high conservation value" areas (as per the International Financial Corporation Performance Standard 6 (IFC PS6), see Box 3) OR "Key Biodiversity Areas" and "protected areas," as defined in the Integrated Biodiversity Assessment Tool (IBAT), with additional no conversion requirements for areas identified as "likely" critical habitat by UNEP-WCMC (2017) Global Critical Habitat screening layer (Version 1.0). (See Cambridge (UK): UN Environment World Conservation Monitoring Centre. DOI: https://doi.org/10.34892/nc6d-0z73.)

Starting from the MST provided for Step 1, the decision tree below is a non-exhaustive sector guide for companies in understanding their target-setting requirements as they relate to No Conversion of Natural Ecosystems.

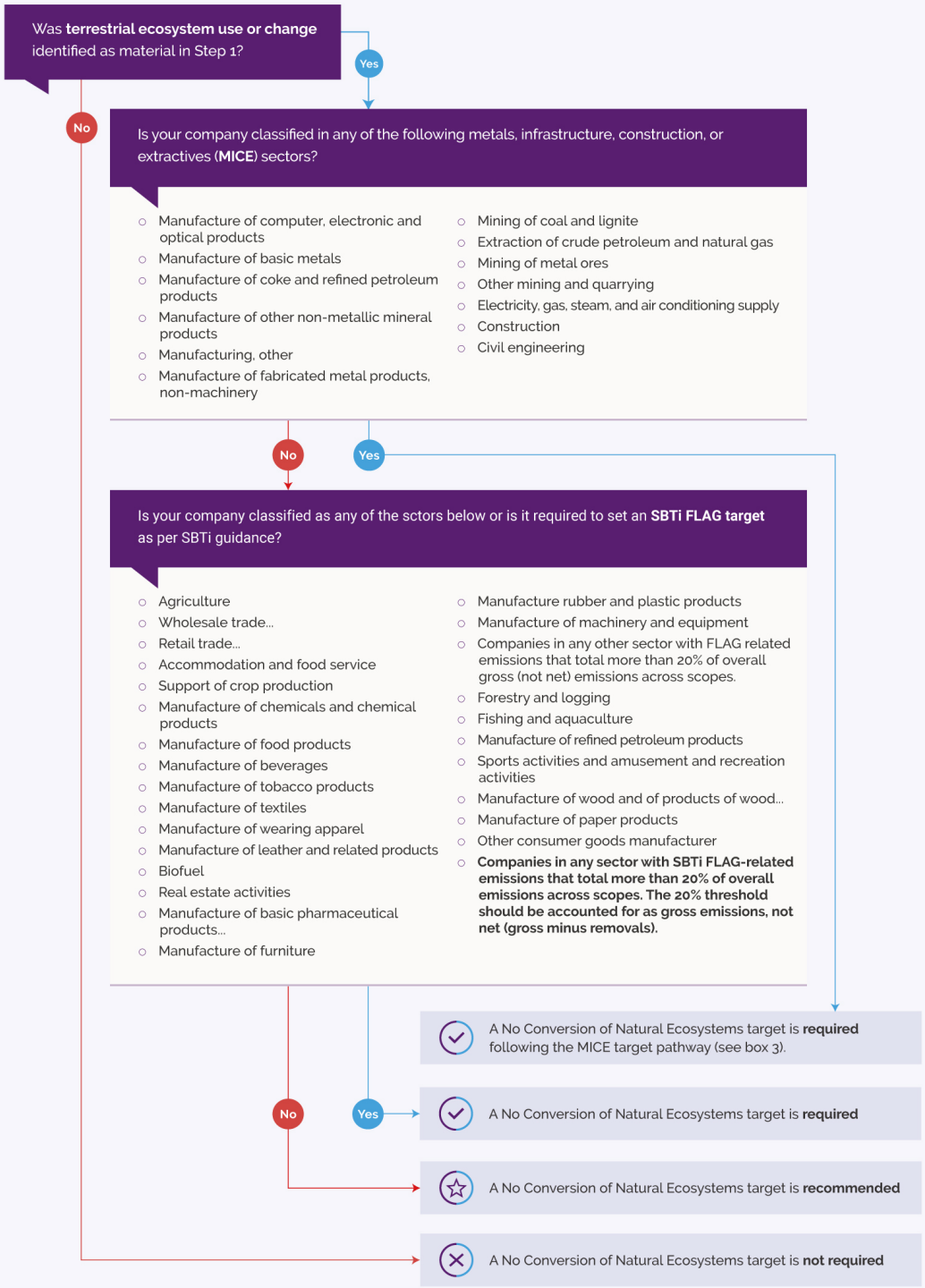


Figure 1: No Conversion of Natural Ecosystems target-setting requirement decision tree.

Box 3: No Conversion of Natural Ecosystems target pathway for metals, infrastructure, construction, extractives (MICE), and other associated sectors.

Sectors that must set a No Conversion target but who belong to the list of MICE sectors (see Figure 1) must commit to no conversion of areas identified through the International Financial Corporation (IFC) Performance Standard 6 (PS6) environmental assessment process as "critical habitat" or "high conservation value" areas. **Alternatively, if companies representing these sectors cannot feasibly comply with the IFC PS6 pathway they may identify areas for no conversion using "Key Biodiversity Areas" and "protected areas - all categories" (available for use as part of the Integrated Biodiversity Assessment Tool (IBAT) and areas identified as "likely" critical habitat through UNEP-WCMC's Global Critical Habitat screening layer.**

The IFC PS6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources is a familiar industry standard regarding the conversion of natural ecosystems. This standard helps companies plan for and address their impacts on biodiversity at a project level.

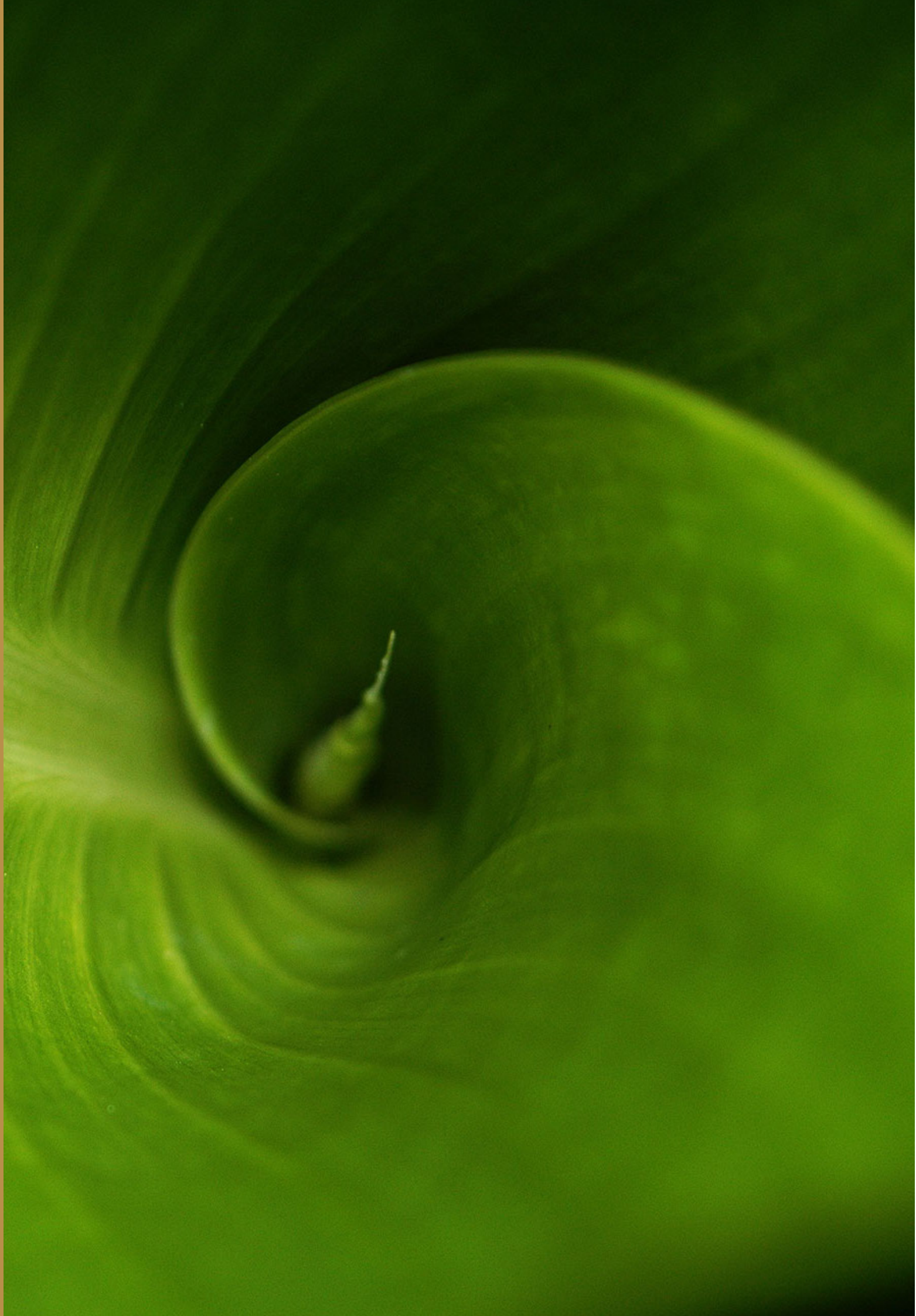
While companies setting science-based targets for nature may not be required to adhere to the IFC's performance standards as their operations may not be contractually tied to IFC financing, this standard still provides a useful framework for how companies that cannot avoid land conversion can avoid or minimize their impacts on natural ecosystems.

It is also likely that companies that have performed a strategic environmental assessment ahead of considering Land targets will be better placed to significantly avoid and reduce impacts on natural ecosystems. These Land targets internalize the outcomes of the IFC PS6 guidance with a notable exception on biodiversity offsets, which are not permitted.

A key requirement under SBTN is that biodiversity offsets will not be accepted as compliant with a science-based target after the target dates required (see Table 5). This applies to all sectors. However, remediation for past conversion between the cutoff date and target validation is required. This differs from offsetting, as the intent is not to convert natural ecosystems and offset impacts elsewhere, but to remedy past conversion.

Companies seeking to utilize IFC's PS6 to comply with the SBTN No Conversion of Natural Ecosystems target must use PS6 and its guidance note (GN6) as implementation guidance. This applies regardless of whether PS6 requirements are officially triggered by PS1 requirements under the IFC process. Companies must complete all relevant environmental and social management system activities included in the IFC PS6 guidance, including a strategic environmental assessment and declarations on compliance with PS6 criteria, and submit their initial and ongoing results to SBTN for validation.

As PS6 is an ongoing process, this documentation will vary based on the stage of company actions (e.g., before impacts occur, for ongoing sites, following activities). This includes demonstrating, where applicable within the target boundary, that no viable alternatives to the conversion of natural land exist. Where IFC PS6 guidance conflicts with SBTN guidance (e.g., supply chain), priority will be given to SBTN guidance. SBTN will develop a standardized reporting template that can be supported by full documentation necessary to demonstrate compliance with the No Conversion of Natural Ecosystems target for the affected sectors.



How to determine if your company must set Target 2: Land Footprint Reduction

A company is *required* to set a Land Footprint Reduction target if it meets the following criteria:

1. Terrestrial ecosystem use or change is material according to Step 1a materiality screening; AND
2. It produces or sources agricultural products, i.e., it is included in Land Footprint Reduction—List A in Figure 2; AND
3. It is required to set an SBTi FLAG target; AND
4. One or both of the following applies:
    a. It has a baseline agricultural land footprint of 50,000 hectares or more as calculated using Chapter 7 of the draft GHGP Land Sector and Removals Guidance;
    b. It has 10,000 or more full-time-equivalent employees.

The decision tree in Figure 2 visualizes these requirements and guides companies in understanding their target-setting requirements as they relate to Land Footprint Reduction. Companies that meet criteria 1–3 for this target but not point 4 *are recommended* to set a Land Footprint Reduction target but are not required to. Further considerations for smaller companies are found in section 2.

How to determine if your company must set Target 3: Landscape Engagement

A company is *required* to set a Landscape Engagement target if:

1. Terrestrial ecosystem use or change OR soil pollution are material according to Step 1a materiality screening.

For those companies that are *not required* to set a Landscape Engagement target, SBTN still *recommends* that these companies set such a target. Engaging in landscape initiatives will be a positive contribution to the transformation needed in our economic systems and the way these interact with the people and places where they operate and can generate benefits for the company.

Step 2: Interpret & Prioritize

For prioritization of locations and the selection of landscapes, which is required for setting Target 3 on Landscape Engagement, please see Step 2C.

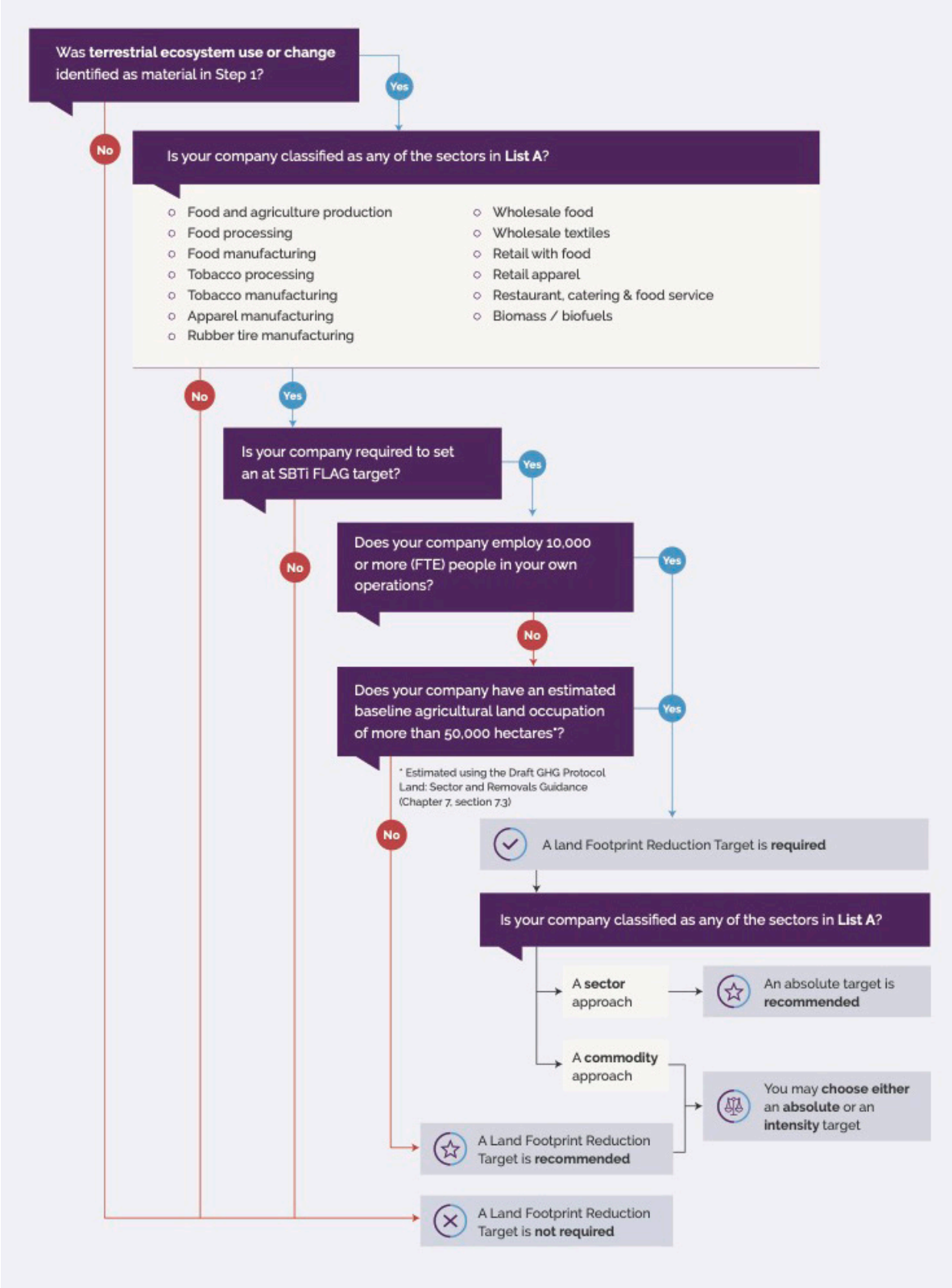


Figure 2: Land Footprint Reduction target-setting requirement decision tree.

ii. Data requirements to set Land targets

Setting Land targets requires data collection (spatial and non-spatial) and management. Data requirements vary according to the stages of the value chain where a company operates and according to those from which it is sourcing.

Please refer to Table 3 for the definitions of stages of the value chain.

The headline data requirements for Step 3: Land are outlined below and summarized in Table 4. These requirements build on those previously introduced for Step 1: Assess and Step 2: Interpret & Prioritize. Companies that have already collected data and completed these initial steps should have much of the data structure needed for setting science-based targets for land, though the No Conversion target requires traceability of conversion-driving commodities at least to subnational jurisdiction.

Target 1: No Conversion of Natural Ecosystems

To set a No Conversion of Natural Ecosystems target, companies need to collect data on:

- Location and delineated area of production units of conversion-driving commodities that they own or manage (see definitions for ownership in Step 1 methods and conversion-driving commodities in Annex 1a).
- Operational site areas (e.g., farms, mines, retail locations, infrastructure, and construction sites) that they own or manage. Please note that direct operations that are not linked to the production of conversion-driving commodities (Annex 1a) are covered by the MICE no-conversion pathway (see Figure 1 and Box 3). This means that even when a company must set a broader No Conversion target for all natural lands, the sites in direct operations that are not linked to the production of conversion-driving commodities must not be established after the cutoff date in areas included in the MICE pathway.
- Geographic origin and volumes of conversion-driving commodities in their supply chains at the production unit level or subnational sourcing area level (see Annex 1a for more information on conversion-driving commodities).
  - When the origin of all commodities is not yet known at this scale, companies must disclose the volumes of each commodity that is known only at the resolution of the country level. Companies must also disclose the volumes of each commodity that is of unknown origin and hence included in target boundary B as per Step 2 requirements.
- For producers, site owners, site operators, and companies sourcing raw conversion-driving commodities from producers or from first point of aggregation: the amount of natural ecosystem conversion that occurred after the company's cutoff date on sites it owns or manages, on production

Table 3: Value chain definitions.

Value chain	Definitions
Operational site	Operational locations within a company's value chain/spheres of control and influence (including direct operations). Sites can include operations from any phase of a product's life cycle, from extractive operations, production facilities, logistics facilities, wholesale and retail, and recycling/end of life.
Direct operations	All activities and sites (e.g., buildings, farms, mines, retail stores) over which the enterprise has operational or financial control. This includes majority-owned subsidiaries.
First point of aggregation	Commodity-specific "first points of aggregation" are listed in Annex 1b.
Upstream	Sourcing separated into: • sourcing from producers and from "first point of aggregation"; and • sourcing from stages of the value chain that are downstream from the first point of aggregation.

units known to be in its supply chains, or in sourcing areas from which it sources commodity volumes.

The information below provides further guidance on how to meet data requirements for setting the target (in Year 0), which must not be confused with data requirements for meeting target requirements by target dates (i.e., the date when deforestation and conversion-free status must be proved).

DIRECT OPERATIONS

Data requirements for target setting are met when all production units and operational sites are demarcated by georeferenced boundaries (i.e., polygons), with the exception of small sites (less than 10 ha), for which one point coordinate near the center of production is sufficient.

Around this point coordinate, a circular buffer with a 12.75-ha area (200 m radius) must be drawn to identify potential conversion occurring within the buffer. Should conversion events be detected in this buffer area, further assessment will be required to identify the real extent of conversion linked to direct operations of the company.

Companies are required to account for conversion post cutoff date(s) for their direct operations.

UPSTREAM

Data requirements for target setting are met when all volumes of conversion-driving commodities (Annex 1a) are identified and communicated following these requirements:

- Volumes are disaggregated per commodity and per traceability level and linked to production unit, sourcing area/ jurisdiction/subnational level of origin.
- All volumes that cannot be traced at least to subnational level remain in target boundary B and will be subject to traceability requirements outlined in Table 7.

AND/OR

- Volumes are physically certified using a scheme that delivers no-conversion assurance based on physical chain of custody systems.

Please see section 1.1 for an overview of target requirements and section 1.4 on how to assess compliance with target requirements by target dates.

Box 4: Note for the use of certification schemes to comply with No Conversion target requirements.

The use of certification schemes to comply with the conditions within the No Conversion of Natural Ecosystems target will rely on the ability of a scheme to provide indisputable evidence that the certification scheme, through a chain of custody system, demonstrates both a deforestation and conversion-free assurance. To date it is not possible for SBTN to evaluate and approve any of the variety of certification schemes that may or may not provide such assurance. As such, companies wishing to use certifications as proof of no conversion (including deforestation free) must submit this evidence to SBTN as part of the target validation process. Preliminary guidance for certifications that demonstrate such assurance for deforestation-free and conversion-free assessments has been provided by the Accountability Framework initiative's *Time for Transparency* report, though the extent to which different certification schemes comply with SBTN's No Conversion target will certainly increase as these SBTN targets and methods are increasingly used by a variety of companies, and will cover additional commodities and sectors.

Target 2: Land Footprint Reduction

To set a Land Footprint Reduction target, companies need to collect data on:

- Hectares of agricultural land in direct operations or upstream (in the company's supply chain). Companies may use production unit data or global data.
- Volume of all material agricultural commodities produced or sourced.
- Primary or statistical data on yields (production per hectare) of those commodities.

Target 3: Landscape Engagement

To set a Landscape Engagement target, companies need to collect data on:

- Location and delineated area of operational sites or sourcing areas pertaining to conversion-driving commodities and locations prioritized in Step 2.
- Origin and volumes at the production unit level or sourcing area level.

All companies that select a landscape initiative will have to acquire data required by the Maturity Matrix in section 3.2.2 to demonstrate that the landscape initiative meets key criteria for target validation.

Box 5: Note for statistical data for Land Footprint Reduction.

Note that for statistical data, if the company has already calculated GHG emissions associated with its land-based operations (scope 1) and/or upstream activities (scope 3), in line with reporting via the GHGP and/or target setting via SBTi, the company is likely to already have its "activity data" on quantities of agricultural products produced or sourced well-organized for calculating the associated land footprint. The company may even be able to use the same environmental database that it used to calculate GHG emissions (e.g., Ecoinvent) to also calculate land footprint. Companies should follow the accounting guidance in the GHGP Land Sector and Removals Guidance (sections 7.3 and 17.3 on "land occupation") to calculate the land footprint associated with the products they produce or source.

Table 4: Version 1.0 science-based targets for land, specific data requirements for target setting.

Target	Requirement	Stage of the value chain relevant to requirement	Data Type	Unit	**Spatial data requirements** (Georeferenced polygons of production units or sourcing areas)
No Conversion of Natural Ecosystems	REQUIRED	Producers and site owners/operators	Location of all sites where conversion-driving commodities are produced	Hectares	Required
		Producers and site owners/operators	Areas converted after cutoff date	Hectares	Required
		Sourcing from producers or first point of aggregation	Sourcing area and volumes of conversion-driving commodities purchased	Hectares and metric tons or equivalent from each area	Recommended
		Sourcing downstream from first point of aggregation	Sourcing area and volumes of conversion-driving commodities purchased	Hectares and metric tons or equivalent from each area	Recommended
		Sourcing from producers or first point of aggregation	Production unit	Hectares	Recommended
	Recommended	Sourcing downstream from first point of aggregation	Production unit or sourcing areas of conversion-driving commodities purchased	Hectares	Recommended
Land Footprint Reduction	REQUIRED	Producers and site owners/operators	Volumes of agricultural commodities produced by production location (primary or statistical data)	Metric tons	Recommended
		Producers and site owners/operators	Data on operational sites where commodities are produced (spatial or statistical)	Hectares	Recommended
		Sourcing from producers or first point of aggregation	Volumes of agricultural commodities purchased (primary or statistical data, differentiated to the extent possible by sourcing location)	Metric tons	Not required
		Sourcing from producers or first point of aggregation	Yield of each product purchased (statistical data, matched to the extent possible with the sourcing locations linked to the purchasing volume data above (e.g., national or subnational yield data)	Metric tons per hectare per year	Not required
		Sourcing downstream from first point of aggregation	Volumes of agricultural commodities purchased (primary or statistical data, differentiated to the extent possible by sourcing location)	Metric tons	Not required
		Sourcing downstream from first point of aggregation	Yield of each product purchased (statistical data, matched to the extent possible with the sourcing locations linked to the purchasing volume data above (e.g., national or subnational yield data)	Metric tons per hectare per year	Not required
Landscape Engagement	REQUIRED	Producers and site owners/operators	Location of all operational sites (at ecosystem level) prioritized in Step 2	Hectares	Required
		Sourcing from producers or first point of aggregation	Sourcing area and volumes of high-impact commodities purchased and volumes of high-impact commodities	Hectares and metric tons or equivalent from each area	Recommended
		Sourcing downstream from first point of aggregation	Sourcing area of high-impact commodities purchased	Hectares	Not required
		Sourcing downstream from first point of aggregation	Volumes of high-impact commodities	Metric tons (or equivalent)	Not required
	Recommended	Sourcing downstream from first point of aggregation	Production unit or sourcing areas of high-impact commodities purchased	Hectares	Recommended

Target 1:
No Conversion of Natural Ecosystems

To set and validate science-based targets for land, companies in sectors with material land pressures on terrestrial ecosystem use or change are *required* to commit to No Conversion of Natural Ecosystems. The target dates for achieving conversion-free operations and supply chains are differentiated according to the level(s) at which a company operates along supply chains, the type of commodities sourced, and the origins of those commodities.

This chapter of the SBTN Land Guidance sets out:

1. The details of the No Conversion of Natural Ecosystems target.
2. How companies will set the target.
3. How companies will account for and communicate about conversion.
4. Technical annexes and supplementary material articulating the scientific bases of the target and other supporting materials.

1.1. What is a No Conversion of Natural Ecosystems target?

The intention of the No Conversion of Natural Ecosystems target is to avoid the wholesale change of a natural ecosystem to another land use, or a profound change in a natural ecosystem's species composition, structure, or function.

For this method, conversion is defined as including severe degradation or the introduction of management practices that result in substantial and sustained change in the ecosystem's former composition, structure, or function or that of the species that inhabit it. Changes to natural ecosystems that meet these criteria are considered conversion within the scope of these methods regardless of whether the conversion itself is legal.

Companies in certain sectors, with material land pressures on terrestrial ecosystem use or change, will commit to No Conversion of Natural Ecosystems after a fixed **cutoff date** (see Box 6).

For SBTN Land Target 1 (No Conversion of Natural Ecosystems), **companies *must use* cutoff dates no later than 2020 as the reference for assessing conversion of natural ecosystems** (forests and non-forests). Where other cutoff dates earlier than 2020 exist, companies *must* use those earlier dates (e.g., sectoral and regional cutoff dates).

Box 6: Defining cutoff dates and target dates.

Cutoff dates:
To assess whether land conversion has occurred, land use change events are considered over an assessment period lasting from a cutoff date until the present.

The cutoff date provides a baseline for the target; after this date, any conversion of natural ecosystems on a given site renders the materials produced on that site non-compliant with a No Conversion target.

As recommended by the Accountability Framework initiative (AFi), cutoff dates should align with existing sectoral or regional cutoff dates where they exist, such as the Amazon Soy Moratorium, and cutoff dates associated with certification should not be later than 2020.

Target dates:
Target dates are the time by which companies must achieve their Land targets.

TARGET DATES FOR DEFORESTATION

Please note that the target dates for achieving the no-conversion requirements are for the combined objective of no deforestation and no conversion together. However, companies must meet the no-deforestation component of these requirements by 2025, for all stages of the value chain, for the following commodities: soy, cattle, oil palm, wood, cocoa, coffee, and rubber. This requirement is aligned with AFi, the SBTi FLAG requirements and the European Deforestation Regulation (EUDR EU 2023/1115).

MATERIALITY THRESHOLD FOR HIGH-IMPACT COMMODITIES OF CONVERSION-DRIVING COMMODITIES

Companies sourcing high-impact commodities must set targets to manage all impacts associated with these. For the No Conversion target, companies should focus on the commodities that are major drivers of conversion. These can be found in the Step 1 high-impact commodity list, which covers commodities relevant for all pressures, and in Annex 1a of this document for conversion-driving commodities.

Table 5: No Conversion targets: stages of the value chain and their defined target dates. "Conversion-driving commodities" are outlined in Annex 1a.

No Conversion of Natural Ecosystems: Target requirements		
Direct operations	**Location of operation**	**Deforestation- and conversion-free (DCF) target*** Cutoff dates must not be later than 2020
Site owners/operators	All natural lands**	**2025**: 100% DCF across all sites.
Producers	All natural lands	**2025**: 100% DCF across all conversion-driving commodities (Annex 1a).
Upstream	**Origin of commodities**	**Deforestation- and conversion-free (DCF) target*** Cutoff dates must not be later than 2020
Sourcing from producers and from first point of aggregation	Natural forests and conversion hotspots	**2025**: 100% Deforestation-free and DCF in conversion hotspots for soy, cattle, oil palm, wood, cocoa, coffee, and rubber.
	All natural lands	**2027**: 100% DCF in all natural lands for all other conversion-driving commodities (Annex 1a).
Sourcing from stages downstream of first point of aggregation	Natural forests	**2025**: 100% Deforestation-free for soy, cattle, oil palm, wood, cocoa, coffee, and rubber.
	Conversion hotspots	**2027**: 100% DCF in conversion hotspots for soy, cattle, oil palm, wood, cocoa, coffee, and rubber.
	All natural lands	**2030**: 100% DCF in all natural lands for all other conversion-driving commodities (Annex 1a).

*Notes:
1. Companies must meet no-deforestation by 2025 for all stages of the value chain, in alignment with AFi and the SBTi FLAG requirements.
2. Companies can and should define target dates that are more ambitious than those required, if they are able to meet the requirements in less time, if a regional or place-based initiative has a more ambitious target date, or if global progress on conversion-free commitments for a specific commodity exceeds these target requirements. For example, if a company has an existing zero-deforestation commitment and/or is working in support of AFi's 2025 target date ambition for high-risk commodities.
3. Target dates refer to end of calendar year.
4. For a full list of derivative products included for soy, cattle, oil palm, wood, cocoa, coffee, and rubber, see Annex 1 of Regulation (EU) 2023/1115.

** For conversion that is not linked to commodity production (e.g., facilities, retail locations, offices), site owners and operators may follow the alternative no-conversion pathway described for metals, infrastructure, construction, and extractives (MICE) sectors.

TARGET DATES FOR METALS, INFRASTRUCTURE, CONSTRUCTION, AND EXTRACTIVES (MICE) SECTORS

Sectors that must set a No Conversion target but who belong to the list of MICE sectors in Figure 1 must commit to No Conversion of areas identified through the IFC PS6 environmental assessment process as "critical habitat" or "high conservation value" areas. Alternatively, these companies may identify core natural lands for no conversion based on "Key Biodiversity Areas" and "protected areas" (all classes) found within the Integrated Biodiversity Assessment Tool (IBAT) and areas identified as critical habitat in the UNEP-WCMC (2017) Global Critical Habitat screening layer to identify areas for no conversion. Areas identified as protected areas or key biodiversity areas in IBAT and likely critical habitat in the UNEP-WCMC Critical Habitat map shall be included as no-conversion areas whether or not they are identified as natural land in the SBTN Natural Lands Map. Additionally, companies must comply with cumulative areas identified as Key Biodiversity Areas or protected areas in IBAT with a 2020 cut-off date. Protected areas that are degazzetted must still comply with the 2020 cutoff date.

MICE sectors must achieve zero conversion in these areas by 2025 and remediate all post-cutoff date(s) conversion (see section 1.3). In addition, these sectors must clearly demonstrate through established IFC PS6 processes that in all areas identified as natural land, there are no viable alternatives before conversion—as defined by the SBTN Natural Lands Map.

Companies sourcing commodities extracted and produced by these sectors must comply with the following requirements:

- sourcing from producers/extractors must ensure no conversion of critical habitat and high conservation value areas by 2025;
- sourcing from further downstream must ensure compliance by 2027.

INCLUSION OF WASTE AND RESIDUES IN THE SCOPE OF THE NO CONVERSION TARGET

To identify whether waste and residues from the inputs to, processing, or manufacturing of conversion-driving commodities must be included in the scope of the No Conversion target, companies must follow the following hierarchy. Volumes of waste and residues used in such processes will be included within the scope of the No Conversion target based on:

1. Compliance with existing national or relevant jurisdictional legislation defining what constitute waste and residues;
2. Alignment with sectoral best practices on the inclusion of waste and residues;
3. If either option is not clear or available, waste and residue must be included when the product classified as waste and/or residue and has an economic value.

GENERAL DISCLAIMER—CONSIDERATION OF LOCAL RIGHTS AND NEEDS WHEN SETTING CONVERSION TARGETS

Comprehensive guidance for companies on where to avoid the conversion of natural ecosystems is incomplete without a consideration of natural ecosystems that have cultural or social importance for people. In any guidance on how decisions regarding the conversion of natural ecosystems are made, companies should ensure that they have understood and respected the rights of Indigenous People, particularly the right to free, prior, and informed consent (FPIC), and have engaged in collaborative land-use planning processes with local stakeholders for that conversion, and that their actions during the tenure of their operations and beyond ensure respect for the land and human rights of those communities.

It is beyond the scope of this guidance to provide global data for how conversion may or may not affect cultural or social importance. In this regard, companies should assess the potential adverse impacts of conversion on the human and land rights of affected stakeholders as part of a landscape initiative, especially as it relates to their Landscape Engagement targets and following SBTN Stakeholder Engagement Guidance. Additional guidance is available through the United Nations General comment No. 26 (2022) on Land and Economic, Social and Cultural Rights and the United Nations Guiding Principles on Business and Human Rights.

1.2. How to set a No Conversion of Natural Ecosystems target

All companies required to set a No Conversion of Natural Ecosystems target according to section i, "How to determine if your company must set Land targets," must follow the procedure below to identify target requirements and prepare all required materials to be submitted to SBTN for target validation. Target dates and requirements differ according to the level at which a company operates along supply chains, the type of commodities sourced, and the origins of those commodities. See Table 5 for the target requirements, and section 1.2.2 for the definition of conversion hotspots and core natural lands for the No Conversion target.

Note on Step 2—Interpret & Prioritize. ***All locations and activities within the target boundaries (for direct operations and upstream target boundary A) must be included to avoid leakage between locations***. Companies may follow the prioritization approach in Step 2, but all locations must be included within the scope in the first year that targets are set.

1. Understand target dates and requirements
   - There are multiple pathways companies may need to follow to be compliant with the No Conversion method. For example, a company may follow requirements for volumes of conversion-driving commodities that are sourced directly from producers or from the first point of aggregation and follow a different approach for their No Conversion target regarding sourcing from companies further downstream in the value chain.
2. Prepare baseline data
   - Pinpoint direct operations sites and upstream activities on the Natural Lands Map.
   - Assess 2020 natural land baselines against target-setting date (Year 0) conversion.
3. Prioritize locations
   - Use natural lands and conversion hotspots to determine the required and phased approach to target setting.
4. Set targets
   - Use requirements specific to operational locations, value chain position, and commodities sourced to set targets.
5. Submit for validation
   - Once a company is ready to submit its data for target validation (see section 1.6) and the target is approved, a company can make a public statement as outlined in the SBTN claims guidance.

The process and conditions around measuring the conversion of natural ecosystems, allocating responsibility for such conversion, and setting targets will be divided into:

- methods for setting No Conversion targets on direct operations; and
- methods for targets on upstream sourcing of goods or services that lead to natural ecosystem conversion.

HOW TO PREPARE BASELINE DATA

Producers, site owners, and site operators *must*:

a. Map production units (and other operational areas) and locate them within the Natural Lands Map (see section 1.2.1 below).

b. Account for any conversion of natural ecosystems at the level of production unit that occurred after the cutoff date(s), using land cover change data from the cutoff year to target-setting date (Year 0), consulting the Natural Lands Map to see if land cover change occurred on natural lands.

c. Set a No Conversion target for all production units and operational areas.

Those engaged in sourcing conversion-driving commodities *must*:

a. Map the value chain and identify the origin of volumes of all material conversion-driving commodities (Annex 1a) to the production unit or sourcing area (see traceability requirements in Step 2 and Annex 1c).

b. Account for the percentage of commodity volumes in compliance with deforestation- and conversion-free requirements.

c. Calculate the percentage of commodity volumes in compliance with deforestation- and conversion-free requirements.

d. For volumes that are not yet traceable to production unit or sourcing area, engage the supply chain to enhance traceability and increase the percentage of volumes in compliance with deforestation- and conversion-free requirements in line with traceability requirements and target dates (Table 7).

1.2.1. Using the SBTN Natural Lands Map

For all companies setting No Conversion targets, the SBTN Natural Lands Map must be used to:

- Estimate natural ecosystem conversion since 2020 that is associated with the company's operations or commodity volumes in its supply chains.
- Provide the data necessary for companies to operationalize a 2020 cutoff for no-conversion calculations.

Details on how to access and use the Natural Lands Map are included in Annex 1d.
The process and conditions around measuring the conversion of natural ecosystems, allocating responsibility for such conversion, and setting targets will be divided into:

- methods for setting No Conversion targets on direct operations; and
- targets for upstream sourcing of goods or services that lead to natural ecosystem conversion.

In this process, preventing the conversion of natural ecosystems starts with defining natural lands and estimating where they exist by delineating them on a map.

For this target, natural ecosystems are defined in line with AFi's definition of a natural ecosystem as "one that substantially resembles—in terms of species composition, structure, and ecological function—what would be found in a given area in the absence of major human impacts," and can include managed ecosystems as well as degraded ecosystems that are expected to regenerate either naturally or through management (AFi, 2019).[17]
According to this definition, SBTN maintains that natural ecosystems include:

- Largely "pristine" natural ecosystems that have not been subject to major human impacts in recent history.
- Regenerated natural ecosystems that were subject to major impacts in the past (for instance by agriculture, livestock raising, tree plantations, or intensive logging) but where the main causes of impact have ceased or diminished, and the ecosystem has attained species composition, structure, and ecological function similar to prior or other contemporary natural ecosystems.
- Managed natural ecosystems (including many ecosystems that could be referred to as "semi-natural") where much of the ecosystem's composition, structure, and ecological function are present; this includes managed natural forests as well as native grasslands or rangelands that are, or have historically been, grazed by livestock.
- Natural ecosystems that have been partially degraded by anthropogenic or natural causes (e.g., harvesting, fire, climate change, invasive species) but where the land has not been converted to another use and where much of the ecosystem's composition, structure, and ecological function remain present or are expected to regenerate naturally or by management for ecological restoration.

17 https://accountability-framework.org/use-the-accountability-framework/definitions/

While natural forests are of course part of natural ecosystems, a detailed forest definition is also provided by AFi:

Forests are defined as "land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or other land use" (AFi, 2019).

Natural forests are defined as possessing "many or most of the characteristics of a forest native to the given site, including species composition, structure, and ecological function."

Natural forests include primary forest, regenerated second-growth forests, managed natural forests, and forests that have been partially degraded but still retain their composition, structure, and ecological function or are expected to regenerate naturally or by management for ecological restoration. Natural forest and tree plantations are mutually exclusive (AFi, 2019).

AFi's conversion definition is used also in anticipation of utilizing the Natural Lands Map for future monitoring purposes, which includes "a change to another land use or profound change to composition, structure, or function" (AFi, 2019). Such changes are considered ecosystem conversion regardless of whether or not the change was legal.

In the context of this guidance the SBTN Natural Lands Map is not intended to:

- inform scientific research and analysis that use different definitions of natural land;
- quantify the area or relative proportion of natural and non-natural lands;
- supplant existing research and biophysical mapping and analysis on ecosystem science;
- define ecosystems and/or working lands; or
- be used to assess the quality of ecosystems, including value for biodiversity.

This map demonstrates a conservative approach to mapping non-natural lands, meaning that decisions were made with the aim of being precautionary in assigning a non-natural classification.

Due to the lower resolution and variation in accuracy of some of the input data, additional data were used, where available, to apply additional conditions before removing non-natural classes as an added precautionary step. As a result of the conservative approach, the final dataset may overestimate the area of natural lands in some regions.

To develop this map, the approach for identifying natural lands across the globe has been to combine the best available global spatial data on land cover/land use into a single harmonized map at a 30-meter resolution. The land cover data that were best for distinguishing between natural and non-natural land covers have been assessed and selected, using additional data where necessary (see: technical documentation of Natural Lands Map).

Where available, local/regional data from 2020 will continue to be incorporated and prioritized to ensure that local and regional knowledge is best reflected in the map.

During the target-setting process, if it becomes clear that the representation of natural or non-natural land indicated by the SBTN Natural Lands Map is inconsistent with local realities, SBTN will accept petitions for categorical exemptions on a case-by-case basis. The guidelines for submitting such exemptions can be found in this document's supplementary information.

The AFi definition of natural ecosystems has been operationalized to natural lands based on existing landcover/land use data in the Natural Lands Map. Table 1 in the technical documentation of the map shows the AFi operational guidance and describes how it was used to develop the mapping approach. Specific data and methods used are described in sections 2.2 and 2.3 of the technical documentation.

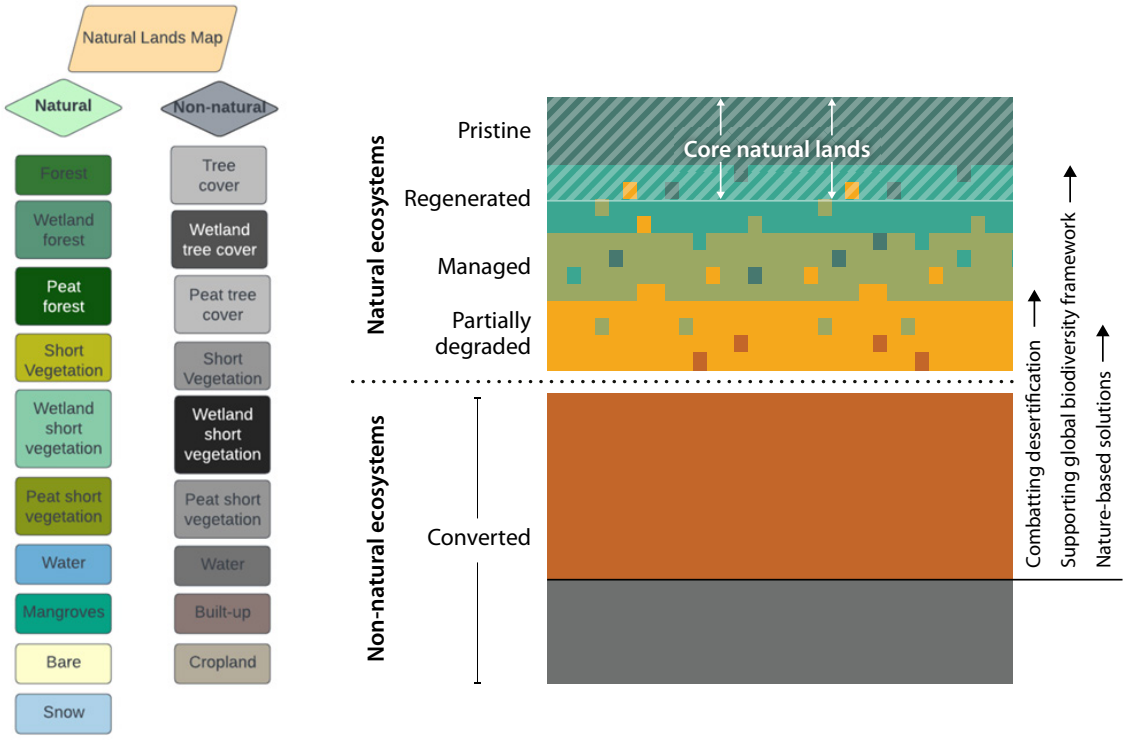


Figure 3: Land-cover classes of the SBTN Natural Lands Map and the classification categories of natural ecosystems.
Note: This figure outlines the range of what is considered "natural" for inclusion in the SBTN Natural Lands Map. Core natural lands are a priority designation within the No Conversion MICE pathway. Here they are indicated as primarily pristine or regenerated ecosystems, though they exist in managed or partially degraded ecosystems as well.

In the absence of specific definitions for other ecosystems from AFi, the Natural Lands Map is built on other definitions from available data. Here, natural grasslands are defined by identifying short vegetation used for cultivation and pasture from that which is natural using Land and Carbon Lab's Global Pasture Watch. Cultivated grasslands are areas where grasses and other forage plants have been intentionally planted and are actively managed for specific uses, primarily for grazing livestock.

The SBTN Natural Lands Map delineates natural and non-natural by using probabilities of global grassland areas separately in two classes: cultivated and natural/semi-natural. Water is defined as surface water present for 20% or more of the year. Snow and ice include any permanent snow and ice. Wetlands are transitional ecosystems with saturated soil that can be inundated by water either seasonally or permanently and can be covered by short vegetation or trees.

The land-cover classes included in the map are largely drawn from two maps of global land cover for 2020:

1. WorldCover, a 10-meter resolution dataset created by the European Space Agency (Zanaga et al., 2021)[18]

2. Global Land Use and Land Cover Change, a 30-meter resolution dataset created by the Global Land Analysis and Discovery Lab at the University of Maryland (Hansen et al., [19]2022 ; Potapov et al., 2022 [20]).

Both share a similar classification scheme and were compared to decide which made a "best fit" for this map.

18 Zanaga, D., Van De Kerchove, R., De Keersmaecker, W., Souverijns, N., Brockmann, C., Quast, R., Wevers, J., Grosu, A., Paccini, A., Vergnaud, S., Cartus, O., Santoro, M., Fritz, S., Georgieva, I., Lesiv, M., Carter, S., Herold, M., Li, Linlin, Tsendbazar, N.E., Ramoino, F., Arino, O., 2021. ESA WorldCover 10 m 2020 v100. https://doi.org/10.5281/zenodo.5571936

19 Matthew C Hansen et al 2022 Environ. Res. Lett. 17 034050

20 Potapov P, Hansen MC, Pickens A, Hernandez-Serna A, Tyukavina A, Turubanova S, Zalles V, Li X, Khan A, Stolle F, Harris N, Song X-P, Baggett A, Kommareddy I and Kommareddy A (2022) The Global 2000-2020 Land Cover and Land Use Change Dataset Derived From the Landsat Archive: First Results. Front. Remote Sens. 3:856903

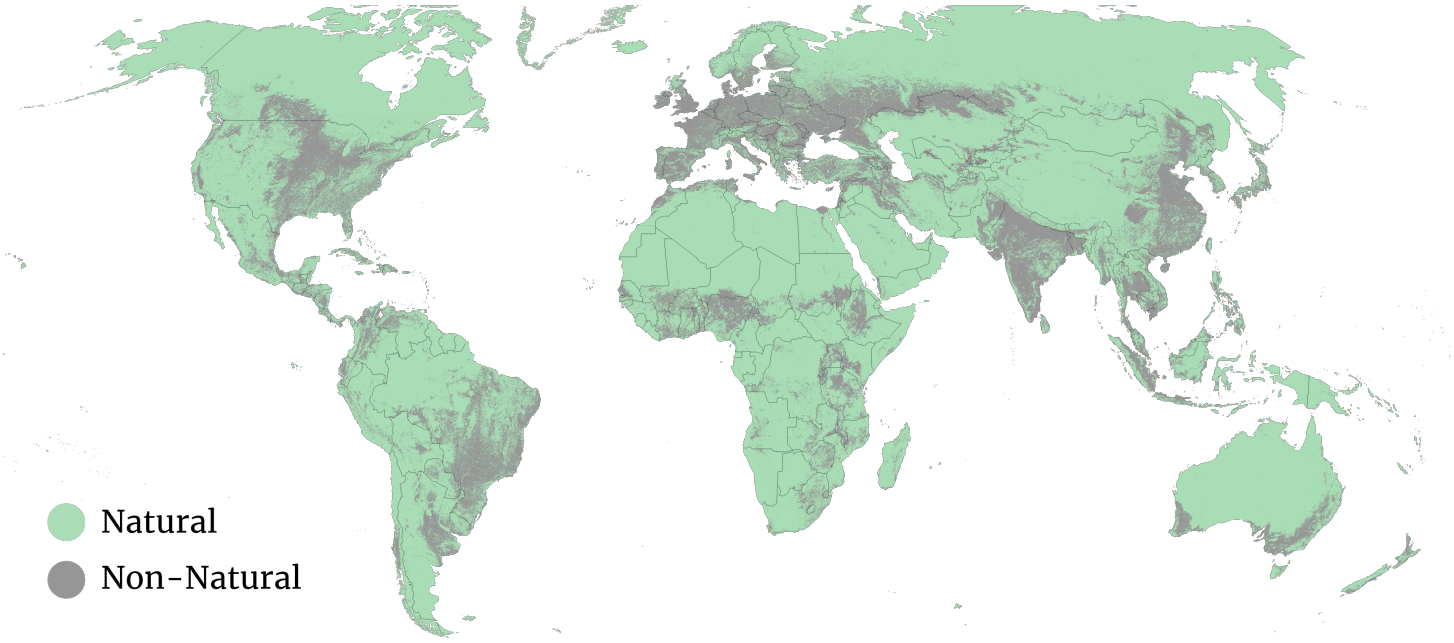


Figure 4: SBTN Natural Lands Map.

Note: There is no data on the glaciers of Greenland. The global scale of the map obscures data at a smaller scale, meaning that areas that look entirely natural or non-natural at the global level will likely have significantly more diversity in classification at a 30-meter resolution of the map.

View and interact with the SBTN Natural Lands Map: https://wri-datalab.earthengine.app/view/sbtn-natural-lands

Technical documentation

Table 6: Examples of ecosystem types that may be included under the map's natural land-cover classes.[1]

Natural land-cover class	Class definition	Ecosystem examples
Forest	Areas with tree cover greater than or equal to 5 meters in height spanning more than 0.5 hectares.	Rainforests, dry forests, montane rainforests, heath forests, temperate forests, boreal forests, woodlands, some types of savannas.
Short vegetation	Areas of land with vegetation shorter than 5 meters, including areas of land dominated by grass or shrubs.	Grasslands, shrublands, heathlands, steppes, vegetated deserts and semi-deserts, some types of savannas.
Wetlands	Transitional ecosystems with saturated soil that can be inundated by water either seasonally or permanently and can be covered by short vegetation or trees.	Peatlands, mangroves, inland, coastal, saline, freshwater, brackish.
Water	Surface water present for 20% or more of the year, where water is the dominant class.	Rivers, lakes, coastal inlets, bays, lagoons.
Snow/ice	Areas covered by permanent snow or ice.	Glaciers, perennial snowfields.
Bare land	Areas with exposed rock, soil, or sand with less than 10% vegetated cover.	Sparsely vegetated deserts, lava flows, screes, alpine rocky outcrops, sandy shorelines.

Note: The ecosystem examples included in this table are not an exhaustive list of all ecosystems included within each land-cover class but are illustrative examples of some types of ecosystems that may be included. Land-cover classes are defined based on the biophysical presence and coverage of certain types of vegetation or landforms, and thus a similar type of ecosystem in different regions may fall into different land-cover classes depending on the biophysical characteristics present. In cases where local data was incorporated, we adopted the local definition of the land cover; therefore, there may be inconsistencies in how land-cover classes are defined (e.g., tree height threshold for forests).

[1] For a full description of land cover classes, please see Table 8 in the technical documentation of the map.

1.2.2. Conversion hotspots and core natural lands

The guidance outlining how a company sets Land targets in support of No Conversion of Natural Ecosystems will require a phased approach. While immediate action is intended to eliminate the conversion of ecosystems, many companies contend with the realities of complex operations and supply chains. In many supply chains, the degree of traceability needed to set a science-based target is currently lacking. To stop ecosystem conversion and set a validated science-based target for land, companies will be required to make investments in traceability in key supply chains where it is lacking.

The phased approach of the No Conversion of Natural Ecosystems target requires companies to undertake a spatial prioritization of natural land, focusing no-conversion efforts on the most immediate needs. For many companies that have deforestation-free commitments, this process will be familiar, and all natural forests are a key component of their commitments to no conversion. However, for this target, deforestation is included as one of many types of natural ecosystem conversion, which includes all natural, terrestrial ecosystems.

To provide guidance to companies regarding places that have accelerated timelines for demonstrating No Conversion, SBTN has included "conversion hotspots." These areas represent a spatial prioritization that will help companies determine where to first focus their initial efforts on eliminating ecosystem conversion within natural lands identified by the SBTN Natural Lands Map that may not be entirely covered by the prioritization approach in Step 2.

Figure 5: Conversion hotspots are defined at the subnational jurisdiction level where they overlap with ecoregions that have experienced significant conversion of natural land since 2000. For the No Conversion target, these areas are prioritized with earlier target dates than other areas of natural land.

Conversion hotspots refer to places with pressures that have resulted in the conversion of natural land classes to non-natural land classes between 2000 and 2020. Based on this historical conversion these areas require prioritized action to prevent further conversion from commodity production and sourcing.

To set a No Conversion target companies must provide conversion-driving commodity sourcing to at least subnational jurisdiction. To calculate jurisdictional conversion hotspots, SBTN has used data from University of Maryland's GLAD land cover data (2000, 2010, 2020) and WRI's Land and Carbon Lab Global Pasture Watch to identify conversion by identifying areas that have changed from either short vegetation or tree cover to cropland or cultivated short vegetation. We calculated the percent conversion from 2000 to 2010 and 2010 to 2020 and aggregated these changes across ecoregions.

To define hotspots the top 10% of ecoregions were selected based on four separate rankings: 1) top 10% in terms of percent conversion from 2000-2020, 2) top 10% in terms of percent conversion from 2010-2020, 3) top 10% in terms of total area of conversion from 2000-2020, and 4) top 10% in terms of total area of conversion from 2010-2020. This provided four ranked lists of ecoregional priority based on remotely observed conversion. 21 ecoregions appeared in all four rankings and these were selected as conversion hotspot ecoregions. Jurisdictions with more than a 50% overlap with these ecoregions are selected as SBTN No Conversion of Natural Ecosystem target Conversion Hotspots (Figure 6).

Similarly, for companies included in the list of MICE sectors (Figure 1), they must either identify high conservation value areas or critical habitat using the process outlined in IFC PS6 or they may use what SBTN defines as core natural lands to satisfy the conditions around the No Conversion target. Core natural lands compiles several relevant datasets to highlight areas of natural land that exhibit exceptional ecological importance. These include key biodiversity areas, protected areas, and "likely" critical habitat defined by the UNEP-WCMC Critical Habitat Screening layer.

Conversion hotspots and core natural lands prioritization does not apply to producers, site owners, or site operators (except for operational sites where conversion-driving commodities are not produced, which may follow the MICE pathway). It is expected that this stage of the value chain does not have data gaps related to the location of operations or production units. Producers of conversion-driving commodities listed in Annex 1a must eliminate conversion of natural ecosystems, including forests, by 2025. Site owners and site operators of other business sectors that are required to set a No Conversion target will similarly be required to eliminate natural ecosystem conversion by 2025 across all sites and all conversion-driving commodities.

A conversion hotspots prioritization applies to the sourcing of commodities listed in the conversion-driving commodity/activity list in Annex 1a. For companies sourcing any of these commodities, a Conversion Hotspot prioritization must be applied to the No Conversion of Natural Ecosystems target. Please note that this prioritization step is separate from and additional to the spatial prioritization that companies complete in Step 2.

Sourcing from producers and from first point of aggregation of soy, cattle, oil palm, wood, cocoa, coffee, and rubber will require 100% conversion-free of all natural forests and Conversion Hotspot geographies by 2025 and all natural lands for all other Annex 1a commodities by 2027.

For sourcing from downstream of the first point of aggregation, companies are required to eliminate ecosystem conversion from 100% of soy, cattle, oil palm, wood, cocoa, coffee, and rubber volumes associated with natural forests by 2025, 100% of these volumes in conversion hotspots by 2027, and 100% of all other conversion-driving commodities across all natural lands by 2030.

It is important here to remember that areas identified as "natural" in the SBTN Natural Lands Map represent a continuum of "natural ecosystems" based on the AFi definition of natural ecosystems. This includes "pristine" lands, regenerated ecosystems, managed natural land, and partially degraded areas that maintain many characteristics of natural ecosystems. As such, a No Conversion target focuses on maintaining existing land use and land cover—which may span many different uses. Conversion hotspots and core natural lands highlight that existing natural land cover and its representative ecological productivity should remain intact. However, as better data become available, and degradation can be better defined as part of landscape initiatives in the Landscape Engagement target, the natural land classification will become more refined, adding greater clarity to the natural/non-natural designation—especially for non-forest ecosystems.

Of direct relevance to the No Conversion target is the inclusion of all natural forests, since many companies have existing deforestation-free commitments with a 2025 target date, which is also a requirement for SBTi FLAG climate targets. Natural forest that is converted to plantation forests is considered as conversion for the purpose of this guidance, aligning with the GHGP Land Sector and Removals Guidance.

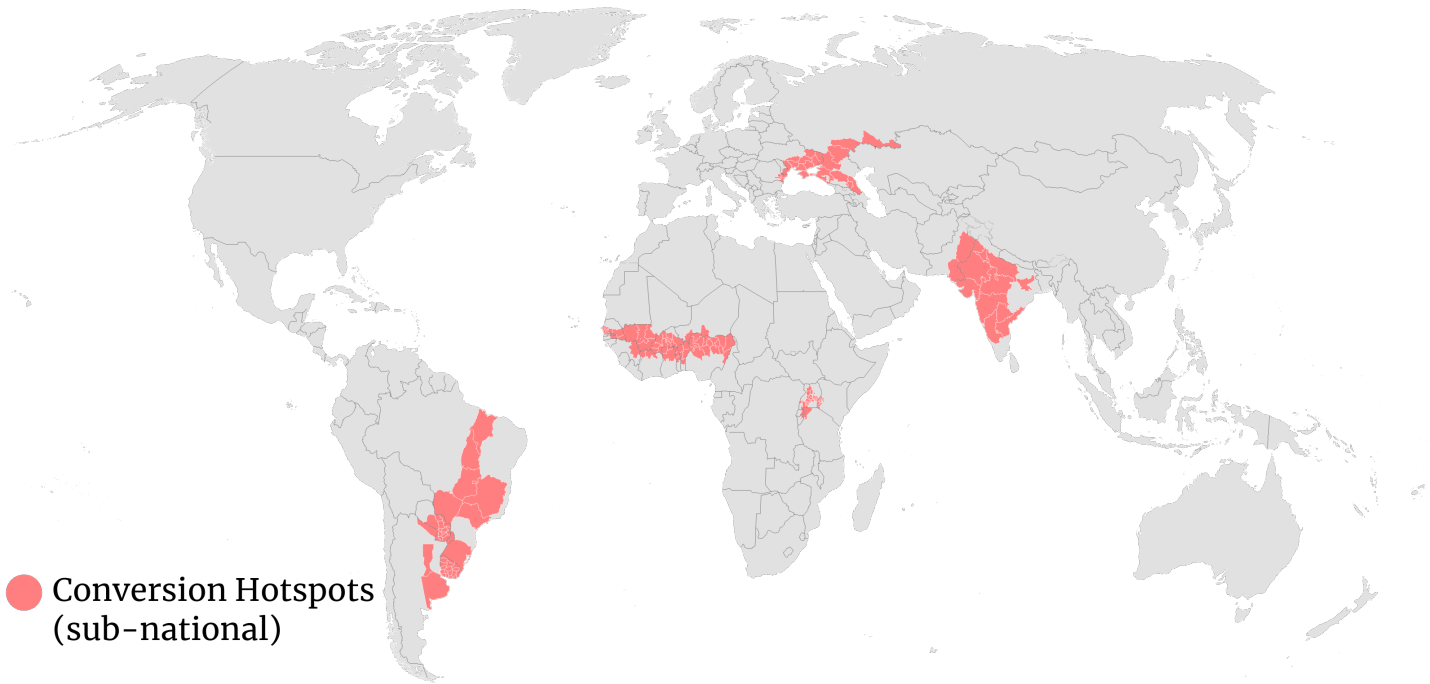


Figure 6: Delineation of the areas representing conversion hotspots for use in the No Conversion of Natural Ecosystems target. These hotspots cover subnational jurisdictions across all or part of the following countries: Argentina, Burundi, Benin, Burkina Faso, Brazil, Côte d'Ivoire, Ghana, Guinea, Gambia, India, Kenya, Sri Lanka, Moldova, Mali, Niger, Nigeria, Pakistan, Paraguay, Romania, Russia, Rwanda,Senegal, Togo, Tanzania, Uganda, Ukraine, and Uruguay. For the complete list of subnational jurisdictions classified as Conversion Hotspots, please see the supplementary information document.

1.3. Accounting for conversion of natural ecosystems and remediation requirements

This section provides guidance on how companies must or should account for conversion.

The following guidelines on accounting are informed by AFi's guidance and adapted to the scope of this target-setting methodology.

The term "land use change" (LUC) is kept here in alignment with the GHGP's accounting guidance but is synonymous with "conversion" and "terrestrial ecosystem change."

To effectively progress toward the achievement of targets to end deforestation and conversion from operations and supply chains, companies *must* measure and account for LUC in credible and consistent ways. This process is also key to accounting for LUC emissions in setting SBTi FLAG targets. After completing the accounting exercise, companies will then use the SBTN Natural Lands Map to understand which portion of LUC constitutes conversion of natural ecosystems.

Please note that the company should not allocate conversion from a year for which the company does not yet have supply chain data. For instance, if the company has supply chain information on sourced volumes up to 2021, then only conversion between 2020 and 2021 should be allocated to those volumes if the company has used 2020 as the cutoff date.

Companies can account for conversion using two methods that are illustrated in the following sections:

- Assessment of conversion at the **production unit** level, which requires full traceability and spatial data.
- Assessment of conversion at the **sourcing area** level, which requires traceability at least at the subnational level.

The requirements for assessing conversion and the date by which the assessment must cover all volumes included in the target boundaries A and B are summarized in Table 7 on next page.

1.3.1. Land use change—scale

Land use change *may* be assessed based on production unit-level information for direct operations and/or estimated based on the attribution of LUC occurring at the level of the sourcing area for upstream activities.
The parallel processes for calculating LUC emissions are called direct (dLUC) and statistical land use change (sLUC), respectively (see Chapter 7 of the GHGP Land Sector and Removals Guidance).

The determination of the appropriate scale of analysis will largely depend on the ability of the company to trace products through the supply chain to their origin, as well as the extent to which that origin is associated with risk of deforestation or ecosystem conversion and the appropriate scale of management given the context of production and sourcing.

Box 7: Information on traceability from the latest AFi guidance.

For companies that purchase agricultural or forestry commodities, traceability is necessary to determine the origin of the materials in their supply chains and ascertain when land use change (LUC) took place in these locations of origin. Traceability may be facilitated by internal company systems, business-to-business disclosure by suppliers, third-party certification programs, or other methods for attaching information about origins to product volumes. Traceability to the production unit of origin is preferable in most cases and allows for the highest level of supply chain control and the most precise LUC accounting. However, recognizing that full traceability to production units is not always available, and that in some contexts a sourcing area or jurisdiction may be the most relevant scale for managing deforestation and conversion risks, this guide also explains how deforestation/conversion and associated emissions can be estimated at an area level.

Table 7: Requirements for the assessment of post-cutoff date conversion.

No Conversion of Natural Ecosystems: Assessment of post-cutoff date conversion			
Direct operations	**Location of operation**	**Deforestation- and conversion-free (DCF) target*** Cutoff dates must not be later than 2020	**Assessment of post-cutoff date conversion**
Site owners/ operators	All natural lands	**2025**: 100% DCF across all sites.	**Before target validation** all volumes of all conversion-driving commodities in scope must be traceable at least to subnational level and the assessment of conversion performed using one of the available approaches.
Producers	All natural lands	**2025**: 100% DCF across all conversion-driving commodities (Annex 1a).	
Upstream	**Origin of commodities**	**Deforestation- and conversion-free (DCF) target*** Cutoff dates must not be later than 2020	**Assessment of post-cutoff date conversion**
Sourcing from producers and from first point of aggregation	Natural forests and conversion hotspots	**2025**: 100% Deforestation-free and DCF in conversion hotspots for soy, cattle, oil palm, wood, cocoa, coffee, and rubber.	**End of 2025** all volumes of soy, cattle, oil palm, wood, cocoa, coffee, and rubber in scope must be traceable at least to subnational level and the assessment of conversion performed using one of the available approaches.
	All natural lands	**2027**: 100% DCF in all natural lands for all other conversion-driving commodities (Annex 1a).	**Before 2027** all volumes of all conversion-driving commodities in scope must be traceable at least to subnational level and the assessment of conversion performed using one of the available approaches.
Sourcing from stages downstream of first point of aggregation	Natural forests	**2025**: 100% Deforestation-free for soy, cattle, oil palm, wood, cocoa, coffee, and rubber.	**End of 2025** all volumes of soy, cattle, oil palm, wood, cocoa, coffee, and rubber in scope must be traceable at least to subnational level and the assessment of conversion performed using one of the available approaches.
	Conversion hotspots	**2027**: 100% DCF in conversion hotspots for soy, cattle, oil palm, wood, cocoa, coffee, and rubber.	
	All natural lands	**2030**: 100% DCF in all natural lands for all other conversion-driving commodities (Annex 1a).	**Before 2030** all volumes of all conversion-driving commodities in scope must be traceable at least to subnational level and the assessment of conversion performed using one of the available approaches.

There are three primary scales at which land-use change can be assessed:

1. **Traceability to the production unit of origin**
   - This means that companies are able to trace commodity volumes to specific mapped production units (e.g., farms, ranches, mines, fields, plantations, forest management units).
   - AFi defines a production unit as a discrete land area on which a producer cultivates crops, manages timber, or raises livestock. In the context of this guidance, the understanding of production units is expanded to the extraction sites of hard commodities listed in Annex 1a.
   - A production unit will generally be a contiguous land area or proximate group of plots managed by the same owner, regardless of any internal subdivisions.
   - Production units should be demarcated by georeferenced boundaries (i.e., polygons), with the exception of small sites (e.g., less than 10 ha), for which one point coordinate at the geographic center of the production and a circular buffer around the point that represents 10 hectares will be sufficient. The same approach explained for production units can be used for project sites (e.g., mining sites, construction sites).

Table 8: Appropriate measures of land use change and associated emissions.

Level of traceability and monitoring	Position in the supply chain	Ecosystem examples	Unit of analysis	
			Deforestation and conversion (disaggregated by commodity)	Emissions from land use change
Production Unit	Own operations (scope 1 emissions)	Own farms/plantations	Hectares of deforestation or conversion in operations since cutoff date % of total hectares owned or managed that this represents	Scope 1 dLUC (tons CO_2 equivalent)
	Supply chain (scope 3 emissions)	Known supply chain farms/plantations	Hectares of deforestation or conversion on production units in supply chain since cutoff date % of total hectares on known farms that this represents	Scope 3 dLUC (tons CO_2 equivalent)
Sourcing area	Supply chain (scope 3 emissions)	Known sourcing (e.g., mill sourcing radius, production landscapes, or subnational jurisdictions)	Hectares of natural ecosystem conversion in sourcing areas since cutoff date that may be attributed to the company	Scope 3 sLUC (tons CO_2 equivalent)
	Supply chain (scope 3 emissions)	Country of origin	Volume of materials (and proportion of total sourced from each country*)	
		Unknown origin	Volume of materials (and proportion of total sourced for which region is unknown*)	

*Where there is limited to no traceability, hectares of deforestation and conversion cannot be estimated. Source: Accountability Framework Initiative.

2. **Traceability to the sourcing area**
   - This means that products are traceable to a known area or region where the material was produced or extracted, but that the specific production unit of origin is not known.
   - Sourcing area-level boundaries could include a sourcing radius from a first point of collection or processing facility (e.g., a radius from a palm oil mill), a defined production landscape (e.g., the area covered by a smallholder cooperative), or a subnational jurisdiction (e.g., municipality).

3. **Limited or no current traceability**
   - This means that products can currently only be traced to a country of origin or that the origin of products is unknown and should be placed in target boundary B.

1.3.2. Land use change—at production unit level

Monitoring conversion at the level of production units (e.g., farms, ranches, mines, fields, plantations, forest management units) provides the greatest amount of precision about the impact of commodities in company operations and supply chains. It is the best way to determine whether products are linked to recent deforestation or conversion.

When accounting for deforestation and conversion at the site level, all conversion in the production unit that has occurred since the cutoff date (for deforestation/conversion) or during the assessment period (for LUC emissions) must be included, regardless of the current use of that land (i.e., whether it is used to produce the commodity of interest, to produce another commodity, has not yet been used to produce a commodity, or is not currently being used for production).

Please consult Annex 1c "Accounting for land use change at the level of the production unit" for additional information on accounting.

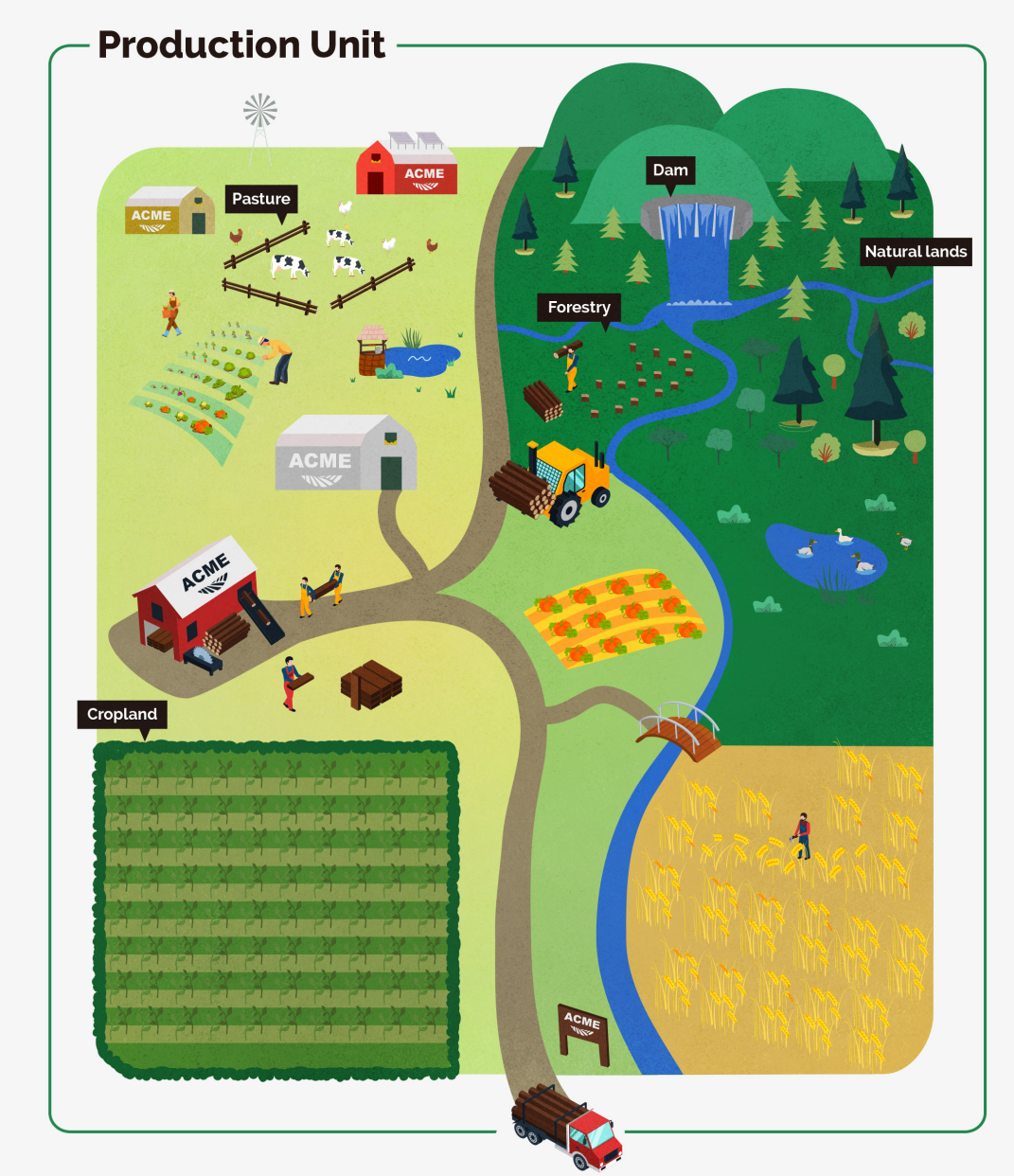


Figure 7: Demonstrates the SBTN definition of production unit: A plantation, farm, ranch, or forest management unit, or production site. This includes all plots used for agriculture or forestry that are under one management, located in the same general area, and share the same means of production. It also includes natural ecosystems, infrastructure, and other land within or associated with the plantation, farm, ranch, site, or forest management unit. (Adapted from AFi)

1.3.3. Land use change—at sourcing area level

Accounting for deforestation and conversion associated with commodities at the scale of a sourcing area may be appropriate in a range of circumstances, including when:

- Companies do not yet have physical traceability to the production unit level.
- Sourcing area is the most relevant scale for managing deforestation and conversion risk.
- Companies source from jurisdictions or landscapes where it can be shown that there has been no recent conversion.

When allocating LUC at an area level to specific commodity volumes, all LUC related to agriculture (for crop or livestock products), forestry (for forest products), and hard commodities for relevant sectors must be included in the analysis. Consideration of all commodity-related LUC allows companies and others to best account for varied LUC trajectories or indirect LUC pressures, providing an appropriately conservative approach to allocation.

The GHGP provides two recommended approaches for allocating LUC in a given area (see AFi guidance[21] and Chapters 7 and 17 of the GHGP Land Sector and Removals Guidance[22]):

1. Allocation based on land footprint.
2. Allocation based on commodity expansion.

In all cases, the method and data sources used to allocate LUC and associated emissions to products within a sourcing area *must* be clearly disclosed as forest or non-forest conversion and ideally disaggregated by ecosystem where possible.

21 https://accountability-framework.org/use-the-accountability-framework/operational-guidance/

22 https://ghgprotocol.org/land-sector-and-removals-guidance

1.4. How to assess compliance with target requirements

Detailed guidance on the implementation of actions to achieve targets will be released by SBTN as guidance on Step 4: Act and Step 5: Track. This section provides a brief anticipation of how companies can assess their progress toward deforestation- and conversion-free status of sourced commodities.

Building on AFi's Operational Guidance on Supply Chain Management, companies can assess the deforestation- and conversion-free status of the commodities they source by:

1. Tracing commodities back to the production or processing units of origin and ensuring that conversion events did not occur after the relevant cutoff date.
2. Tracing commodities back to an intermediate supplier that itself has effective control mechanisms in place and can demonstrate the ability to trace its supplier to the production or processing units of origin and can demonstrate compliance with target requirements.
3. Utilizing credible assurance systems (e.g., credible certification systems based on physical chain of custody systems) capable of linking raw material supplies with production units in compliance with target requirements.
4. Tracing materials to jurisdictions or landscapes where it has been demonstrated that conversion did not occur after the relevant cutoff date.

1.5. Remediation of conversion after cutoff date(s)

Companies that set a target of No Conversion of Natural Ecosystems through this guidance will be required to address conversion that occurs after 2020 or earlier cutoff dates where relevant.

After the target date, only minimal levels of conversion can occur without the company falling out of compliance with the target requirements. Any residual minimal conversion will have to be remediated.

DE MINIMUS CONVERSION, GUIDANCE FOR PRODUCERS:

Clearing of less than 5% of the total production unit size, or 20 hectares (whichever is stricter), is not considered to be conversion. This does not apply if the local law is stricter.

Conversion shall be assessed cumulatively over time. Multiple small instances of conversion that in total exceed the threshold are considered non-compliant.

DE MINIMUS CONVERSION, GUIDANCE FOR DOWNSTREAM COMPANIES:

As downstream companies do not have direct control over production units, a downstream company may remain in compliance with the No Conversion target as long as 95% of their purchased commodity in a given year is sourced from areas that demonstrate no conversion.

Downstream companies are responsible for remediating minimal conversion within their supply chains, as defined in the Remediation Guidance.

Remediation does not only serve environmental objectives, but it must be directed also to the improvement of the livelihoods of the people and communities that may have been adversely affected by the conversion of natural lands or that depend on those ecosystems.

Please note that while accounting for conversion is required for target validation, the remediation of conversion post cutoff date(s) is part of Step 4: Act, hence companies can start the remediation process after target validation.

SBTN Land is currently developing a cross-sectoral common approach to remediation of conversion of natural lands on the basis of AFi's Restoration and Compensation Guidance.

Table 9: Proposed requirements for the remediation of post-cutoff date conversion.

No Conversion of Natural Ecosystems: Remediation requirements per commodity		
Direct operations		**Remediation of post-cutoff date(s) conversion**
Site owners/ operators & producers		All conversion that occurs after 2020 or any other relevant cutoff date(s) must be remediated in accordance with SBTN's Remediation Guidance.
Upstream	**Traceability level**	
All sourcing	Option 1. Traceability to production-unit level	Support producers or site owners/operators in remediating conversion that must be implemented in accordance with SBTN's Remediation Guidance.
	Option 2: Traceability to subnational level	For all volumes that cannot be demonstrated to be DCF and that cannot be traced to production-unit level, assess conversion using sLUC linked to sourced conversion-driving commodities using the method explained in section 1.3.3. The sLUC in a subnational jurisdiction or sourcing area linked to sourced volume from such areas must be allocated using the methods explained in section 1.3. The conversion footprint associated to those volumes (measured in ha of statistical conversion) must be added to the scope of the Landscape Engagement target. The landscape initiatives selected must include an area under ecological restoration of the same size or larger than the conversion footprint that the company must remediate.

1.6. Target validation and disclosure

To begin the target validation process, companies *must* submit:

- ISIC sector classification(s) describing their direct operations and upstream activities.
- Data required in section ii, "Data requirements to set Land targets".

SBTN is assessing reporting requirements for companies that will set a No Conversion of Natural Ecosystems target, which will be defined in the SBTN Step 5 upcoming guidance.

In the interim, and in alignment with AFi, this guidance recommends that companies disclose the above information by using the CDP's forests questionnaire[23] and by following the Global Reporting Initiative's Agriculture, Aquaculture, and Fisheries Sector Standard.[24]

The suggested reporting requirements are:

- Deforestation and conversion footprint in their operations disaggregated by ecosystem type based on IUCN Global Ecosystem Typology.
- Commodity volumes in their supply chains, disaggregated per level of traceability as follows:
  - Traceable to production unit
  - Traceable to sourcing area/jurisdiction/ subnational level
  - Traceable to country of origin
  - Not yet traceable.
- For all volumes, the percentage that is assessed to be deforestation- and conversion-free must be indicated.
- For companies following the MICE pathway for no conversion (see Box 3), reporting will include their completed and ongoing IFC PS6 assessment and progress (as outlined in section ii) or their assessment of core natural lands for no conversion as described in Box 3.

23 https://guidance.cdp.net/en/guidance?cid=31&ctype=theme&idtype=ThemeID&incchild=1&microsite=0&otype=Guidance&tags=TAG-646%2CTAG-609%2CTAG-600

24 https://www.globalreporting.org/standards/standards-development/sector-standard-for-agriculture-aquaculture-and-fishing/

1.7. Template statement for No Conversion of Natural Ecosystems target

No Conversion of Natural Ecosystems targets will be stated in the format illustrated in Box 8.

Box 8: Formulation of No Conversion of Natural Ecosystems target.

DIRECT OPERATIONS

[Company name] will have zero conversion of natural ecosystems by *[target year]*, compared with a 2020* baseline.

[Company name] will remediate all past conversion occurring between 2020* and *[target year]*.

Both targets are required.

UPSTREAM (SOURCING FROM PRODUCERS OR FIRST POINT OF AGGREGATION)

[Company name] will source 100% of volumes of commodities (Annex 1a: conversion-driving commodities) from areas known to be conversion-free from 2020.*

[Company name] will remediate all past conversion occurring between 2020* and *[target year]* (associated with its share of volumes sourced).

Both targets are required.

UPSTREAM (SOURCING FROM COMPANIES DOWNSTREAM OF THE FIRST POINT OF AGGREGATION)

[Company name] will source 100% of volumes of commodities (Annex 1a: conversion-driving commodities) from areas known to be conversion-free from 2020.*

* Or other earlier cutoff dates (e.g., regional or sectoral cutoff dates).

1.8.Why is the No Conversion target needed?

The contributions of natural ecosystems are critical to planetary and human health. They provide protection, livelihoods, materials, food, fresh water, and a sense of cultural identity to billions of people, including Indigenous Peoples, local communities, and many others.[25, 26] They store vast quantities of carbon. Forests alone provide habitats for about 80% of amphibian species, 75% of bird species, and 68% of mammal species.[27]

Yet humans have converted between one third and one half of habitable land for crop and livestock production, undermining these critical ecosystem services on which we rely.[28] Deforestation and land degradation cost as much as US$6.3 trillion a year through their impact on forest and agricultural productivity.[29] In sub-Saharan Africa, over two thirds of productive land is degraded, compromising its capacity to support people and nature and undermining the livelihoods of at least 450 million people.[30]

The conversion and degradation of forest land has been given significant attention via dedicated initiatives and private sector commitments to end deforestation. Over one third of forests has been lost globally due to deforestation since it first became a pervasive threat in temperate zones between the 18th and 20th centuries, and the problem has drastically increased in the tropics over the past 50 years (Hansen et al., 2013; Haddad et al., 2015).

25 Beatty, C. R. et al. (2022). The Vitality of Forests: Illustrating the Evidence Connecting Forests and Human Health. World Wildlife Fund, Washington, DC, United States.

26 Chaplin-Kramer, R. et al. (2023). Mapping the Planet's Critical Natural Assets. Nature Ecology & Evolution, 7: 51–61. https://doi.org/10.1038/s41559-022-01934-5.

27 FAO. 2022. The State of the World's Forests 2022. Forest pathways for green recovery and building inclusive, resilient and sustainable economies. Rome, FAO

28 https://www.fao.org/food-agriculture-statistics/en/

29 Sutton, P. C. et al. (2016). The Ecological Economics of Land Degradation: Impacts on Ecosystem Service Values. Ecological Economics, 129: 182–192.

30 UNEP. (2015). The Economics of Land Degradation in Africa. Bonn: ELD Initiative. Available online at: https://www.eld-initiative.org/fileadmin/ELD_Filter_Tool/Publication_The_Economics_of_Land_Degradation_in_Africa___Reviewed_/ELD-unep-report_07_spec_72dpi.pdf

Table 10: Amount of conversion of global ecosystems, grouped by their vegetation/land cover attribute.[40]

Vegetation/land cover	Current (actual) area (thousand ha)	Converted (potential) area (thousand ha)	Conversion (%)
Forestlands	4,377,500	1,501,203	25.5
Shrublands	1,632,918	202,040	11
Grasslands	1,267,528	891,752	41.3
Sparsely or non-vegetated	2,967,203	58,316	1.9
Snow and ice	228,479	10	0.005

Since 2010, the global net loss of forests is estimated to be 4.7 Mha per year.[31] The rates of tropical deforestation are now particularly dire: they are estimated to account for more than 97% of global deforestation in the past century and more than 90% of global deforestation between 2000 and 2018.[32, 33] Across the tropics, 90% of recent deforestation has been driven by agriculture, the majority of which is caused by seven commodities: cattle, oil palm, soy, cocoa, rubber, coffee, and plantation wood fiber, with cattle having by far the largest impact.[34]

Less attention has been given to the loss of non-forest natural ecosystems, although they too are critically important. Non-forest ecosystems are suffering conversion rates as high or higher than those of forests.[35]

For example, natural grasslands—which hold high levels of biological diversity, are crucial for the mitigation of climate change, and provide significant value to people—are among the most threatened ecosystems in the world.[36] Efforts toward avoiding the conversion of forests should be broadened to incorporate the conservation of non-forest natural ecosystems,[37] and this guidance walks that path.

For additional information on the importance of natural ecosystems and for the scientific evidence supporting the choice of the No Conversion target, please refer to the supplementary material.

31 FAO and UNEP. 2020. The State of the World's Forests 2020. Forests, biodiversity and people. Rome.

32 https://research.wri.org/gfr/latest-analysis-deforestation-trends

33 FAO. 2022. The State of the World's Forests 2022. Forest pathways for green recovery and building inclusive, resilient and sustainable economies. Rome, FAO.

34 Pendrill, F. et al. (2022). Disentangling the numbers behind agriculture-driven tropical deforestation. Science, 377(6611), abm9267.

35 Sayre, R., Karagulle, D., Frye, C., Boucher, T., Wolff, N. H., Breyer, S., ... & Possingham, H. (2020). An assessment of the representation of ecosystems in global protected areas using new maps of World Climate Regions and World Ecosystems. Global Ecology and Conservation, 21, e00860.

36 Lark, T. J. (2020). Protecting our prairies: Research and policy actions for conserving America's grasslands. Land Use Policy, 97, 104727.

37 Gonçalves-Souza, D., P. H. Verburg, & R. Dobrovolski. (2020). Habitat loss, extinction predictability and conservation efforts in the terrestrial ecoregions. Biological Conservation, 246, 108579.

38 Sayre, R., Karagulle, D., Frye, C., Boucher, T., Wolff, N. H., Breyer, S., ... & Possingham, H. (2020). An assessment of the representation of ecosystems in global protected areas using new maps of World Climate Regions and World Ecosystems. Global Ecology and Conservation, 21, e00860.

Target 2:
Land Footprint Reduction

This chapter of the SBTN Land Guidance sets out:

1. The details of the Land Footprint Reduction target.
2. How companies will set the target.
3. How companies will account for and communicate about land footprint reduction.
4. Technical annexes and supplementary material articulating the scientific bases of the target and other supporting materials.

2.1. What is a Land Footprint Reduction target?

A Land Footprint Reduction target works to limit or decrease pressure on natural ecosystems by reducing the amount of land occupied by human activities and freeing up land for ecosystem restoration. The target applies to large companies that produce or source agricultural products (e.g., food, animal feed, fibers, bioenergy feedstocks), incentivizing them to reduce the amount of agricultural land needed to produce the products in their value chain over time.

Global models indicate that agricultural land footprint reduction of the scale required to achieve global nature goals is possible through a combination of sustainable crop and livestock productivity gains where there are yield gaps, reduced food loss and waste across value chains, more circular use of natural resources, and—in high-income countries—shifts toward healthier, more sustainable and less-land-intensive diets. The scientific basis of this target, including the focus specifically on agricultural land, is articulated in the SBTN Land supplementary materials.

SBTN Land recognizes that companies that are required to set Land Footprint Reduction targets according to this methodology will need to carefully manage potential trade-offs and avoid unintended consequences that can arise as a result of efforts to reduce the global agricultural land footprint. Annex 2b provides an essential and detailed discussion of how companies can manage trade-offs and unintended consequences through response option planning and social safeguards for this target. Additional guidance can be found in SBTN's Stakeholder Engagement document.

"Land footprint"[39] for the purpose of this target refers to the amount of agricultural land required per year to produce the products that the company itself produces or which it sources (reported in hectares per year). It does not necessarily include all land owned or controlled by companies. Agricultural lands that are not attributable to direct operations or upstream value chain activities should not be counted within the Land Footprint Reduction target and thus reductions cannot be applied to extensive land holdings held in reserve.

There are two methods for setting a Land Footprint Reduction target: the absolute reduction approach and the intensity reduction approach. SBTN provides a decision tree in section i and supplementary information in Annex 2a to support companies in choosing which approach to follow.

As a safeguard to ensure that smaller companies producing less-land-intensive products can grow their market share, SBTN only requires companies over a certain size (measured via full-time-equivalent (FTE) employees or by land footprint in hectares) to set a Land Footprint Reduction target. See section i), "How to determine if you must set Target 2" in the Introduction for information on which companies are required to set a Land Footprint Reduction target.

Given the fact that companies will not necessarily have ownership rights over any land freed up through their Land Footprint Reduction target, SBTN does not require companies to necessarily restore that land. Instead, the mechanism for driving restoration is through the Landscape Engagement target (see section 3), which all companies that are required to set Land Footprint Reduction targets will have to set under this methodology.

39 We use "land footprint" interchangeably with agricultural "land occupation" as defined by life cycle assessment approaches. The land footprint refers to the portions of a company's "terrestrial ecosystem use" (as per the SBTN Technical Guidance for Steps 1 and 2) that are working agricultural lands.

2.2. How to set a Land Footprint Reduction target

All companies required to set a Land Footprint Reduction target must follow the procedure below to identify target requirements and prepare all required materials to be submitted for target validation.

Note on Step 2: Interpret & Prioritize—All locations and activities within the target boundary must be included to avoid leakage among locations. It is recommended that companies follow the prioritization approach of Step 2 to guide the implementation and achievement of the target, but all locations must be included within the scope in the first year that targets are set.

1. **Calculate baseline agricultural land footprint**
   - The company calculates its baseline agricultural land footprint following the process explained in the SBTN Technical Guidance for Steps 1 and 2 (sections 3.1-3.2), and in the GHGP Land Sector and Removals Guidance (in the draft version for pilot testing and review, this can be found in sections 7.3 and 17.3 on "land occupation"). The baseline calculation method is summarized below.
2. **Select a method for the allocation of land footprint reduction**
   - The company determines which of two target-setting approaches to use:
     - Absolute land footprint reduction approach
     - Intensity land footprint reduction approach.
3. **Calculate the Land Footprint Reduction target**
   - The company uses the following information to calculate its percentage reduction target:
     - Preferred reduction approach (absolute or intensity)
     - Base year and target year.
4. **Target validation**
   - The company submits its data for target validation (see section 2.3). Once the target is approved, the company can make a public statement as per the SBTN claims guidance.

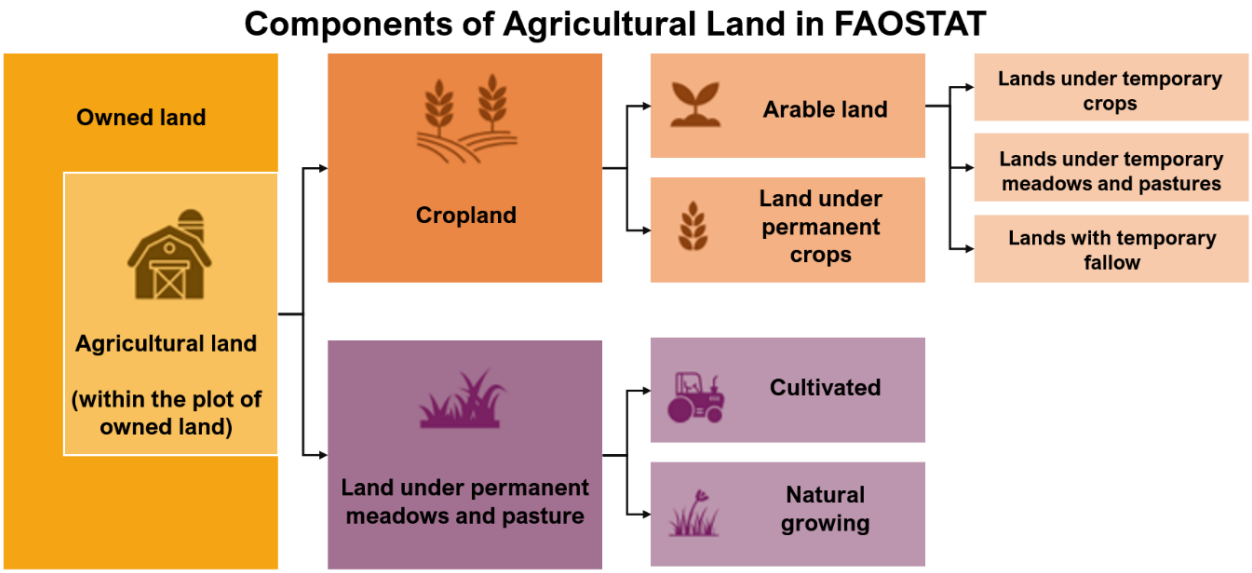


Figure 8: Components of agricultural land in FAOSTAT. Source: Land statistics and indicators: Global, regional and country trends, 2000–2020. FAO 2022.

2.2.1. Calculate baseline agricultural land footprint

This target applies to all agricultural land (cropland and land under permanent meadows and pastures) used to produce the products produced or sourced by a company (Figure 8).

The process to calculate a company's agricultural land footprint (whether to set a baseline or an updated annual inventory) is described in the SBTN Technical Guidance for Step 1 (section 3), and in the GHGP Land Sector and Removals Guidance (sections 7.3 and 17.3 on "land occupation").

Land occupation, in general, can be calculated by using yields (e.g., crop yields) in t/ha/year to convert from tons of product to hectares, or also by using land occupation factors (e.g., m2a/kg) from life cycle assessment databases.

In instances where the land area sourced from is known and it is known that multiple products are produced on that land area each year, then an allocation approach may be necessary.

A company can choose mass (physical) allocation or economic allocation depending on what they think best reflects the relationship between production of the land-based product and the amount of land occupied. For more information on physical and economic allocation, please refer to Chapter 8 of the GHG Protocol, Corporate Value Chain (Scope 3) Accounting and Reporting Standard,[40] with "land occupation" substituting for mentions of "GHG" or "emissions". To calculate baseline agricultural land footprint, companies may collect spatial or statistical data as follows:

- **For purchasing companies with an upstream agricultural land footprint:** statistical (non-spatial) data on quantities of land-based products sourced, locations (e.g., countries and/or subnational jurisdictions) if known, and yield (output per hectare) of each product for each location.
- **For producing companies with an agricultural land footprint in direct operations:** statistical (non-spatial) data on quantities of land-based products produced, and statistical or spatial data allowing for calculation of total surface area of working lands producing those products.
- When using statistical data with quantities of products produced or sourced (e.g., in metric tons), companies can use the simple equation of:

$$\frac{\textit{Quantity of product in metric tons}}{\textit{Yield of that product in metric tons per hectare per year}} = \textit{Land footprint (ha)}$$

  for each product. Companies would sum all estimates across all products to have their complete land footprint "inventory" (GHGP forthcoming, Equation 17.12).
- When using spatial data, companies should sum the hectares in all their active agricultural production areas to estimate total land footprint.

When using statistical data, following the GHGP guidance, companies *should* use the most spatially explicit data available for each commodity produced or purchased, and seek to improve traceability and data quality over time.

If a product's origin is not yet known, a default assumption (e.g., production assumed to be from the same world region as company headquarters) *may* be used to select the appropriate yield data if well justified to SBTN.

When estimating land footprint of purchased mixed products, companies *should* either try to back-calculate the amounts of raw products for the purpose of estimating land footprint (e.g., using product formulation or recipe data) or use reasonable assumptions to simplify the exercise without unduly sacrificing accuracy (e.g., categorizing each mixed product according to its primary ingredient or its top three ingredients). Because estimating land footprint using statistical data can never be perfect, emphasis *should* be given to estimating the land footprint related to products containing conversion-driving commodities (e.g., meat stews versus vegetable-based condiments).

40 https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporing-Standard_041613_2.pdf

Companies *may* refer to the Step 1 Toolbox and the GHGP Land Sector and Removals Guidance (in the draft for pilot testing this can be found in section 17.3) for lists of tools and databases that include yields (in tons/hectare/year) and/or land occupation factors (essentially the reciprocal of yields, in square meter-year (m^2a)) that can be used when companies have statistical activity data.

Clarification note on waste and residual products: If a company setting a Land Footprint Reduction target purchases residual products (i.e., byproducts from other value chains) then the company should use an allocation method (e.g., by mass or by economic value) to estimate the land footprint of the purchased residual product. If a company purchases an agricultural product that is truly a waste product (i.e., a product with no market value) then it can be excluded from the land footprint.

Clarification note on non-timber forest products: Where a company produces or sources non-timber forest products in land classified in FAOSTAT as forest, then those volumes can be excluded from the land footprint calculation. This is in recognition of the role that low-impact harvesting of non-timber forest products can have in bringing economic value to standing forests.

Eligibility for excluding land from the Land Footprint Reduction target boundary: SBTN recognizes the complex web of social and environmental issues and trade-offs inherent in land management and land use planning. As such, if a company has a reasonable explanation for excluding areas of agricultural land from the Land Footprint Reduction target boundary due to efforts to preserve traditional livelihoods, these will be considered by SBTN on a case-by-case basis in the target validation phase.

Companies proposing an exclusion of agricultural land for this reason will need to provide information on the following for these to be considered by SBTN: numbers of hectares to be excluded; location; land-use classification as per FAOSTAT; agricultural products produced on that land; production methods used on the land; and information about the landowner(s) and land manager(s). The company should also provide a justification for how exclusion of these lands from the target boundary will be beneficial for preserving traditional livelihoods.

2.2.2. Select a method for the allocation of Land Footprint Reduction

There are two methods for setting a Land Footprint Reduction target: the absolute reduction approach and the intensity reduction approach (see Table 11). Absolute and intensity targets each have advantages and disadvantages.

Absolute targets can be simpler to calculate and communicate and are more likely to result in global absolute agricultural footprint reductions at the scale required. However, they can limit smaller companies that produce or purchase land-efficient products gaining market share by constricting their ability to grow.

Intensity targets, on the other hand, can be more complex to calculate and communicate, and do not guarantee that total agricultural land use will decline even if companies hit the targets. That said, intensity targets can be appropriate for companies that produce food by helping them set a clear target for sustainable productivity gains, and intensity targets can also be appropriate for the smaller companies mentioned above.

Table 11: Absolute and intensity approaches to Land Footprint Reduction.

Absolute land footprint reduction target	Intensity land footprint reduction target
Companies reduce their absolute land footprint at a linear rate of 0.35% per year compared with the base year.	Companies reduce the land footprint per kg of agricultural products produced at a linear rate of 1% per year compared with the base year.

For both types of Land Footprint Reduction targets, there is a risk that they incentivize unsustainable types of agricultural intensification, and/or that these targets incentivize consumer companies to shift their sourcing from lower- to higher-yielding areas. Annex 2b helps companies manage trade-offs and unintended consequences through response option planning, the setting of complementary environmental targets, and social safeguards.

Given the benefits and challenges with both approaches, for this version of Land targets, SBTN has left open the option for producer and consumer companies to set either type of target. However, absolute targets are recommended for large consumer companies such as retailers given their greater ability to reduce land footprint through demand-side measures such as shifting their portfolios to less-land-intensive products.

For companies where SBTN recommends either the absolute or intensity approach in the decision tree in section i, the company should consult Annex 2a to better weigh the pros and cons of each target-setting approach for their specific context. They may also consult Table 3 in the SBTi FLAG guidance; the "sector approach" in SBTi FLAG corresponds to the absolute approach for this target, and the "commodity approach" corresponds to the intensity approach for this target.

2.2.3. Calculate the Land Footprint Reduction target

In alignment with climate targets, for both absolute and intensity Land Footprint Reduction targets:

- The choice of base year *must* be no earlier than 2015. (The base year does not need to align with the cutoff date(s) used as the reference for assessing conversion of natural ecosystems in the No Conversion of Natural Ecosystems target.)
- SBTN Land *recommends* companies to choose a base year that is representative of the company's activity (e.g., a year greatly affected by the COVID-19 pandemic should not be chosen as a base year).
- Land Footprint Reduction targets *must* cover a minimum of five years and a maximum of ten years from the date the target is submitted to SBTN for an official validation.

Companies are *encouraged* to develop long-term targets (e.g., to 2050) in addition to near-term targets.

The formula for calculating the targets depending on the approach selected is shown in Table 12. See Annex 2a for the scientific justification for the reductions needed for both target approaches.

As shown in Table 12, companies setting absolute Land Footprint Reduction targets would reduce their absolute land footprint at a linear rate of 0.35% per year, or by 3.5% by 2030, from a 2020 base year, and by 10.6% by 2050 from a 2020 base year.

Table 12: Formula for calculating the Land Footprint Reduction target.

Absolute land footprint reduction target	Intensity land footprint reduction target
Number of years between base year and target year * 0.35% per year	Number of years between base year and target year * 1% per year

If a company uses the intensity approach using a 1% intensity reduction per year, it must also express the target in absolute terms. For example, if a company has a target to reduce its agricultural land footprint intensity by 8% by 2030 from a 2022 base year, if it projects 5% growth during that time, then its absolute land footprint reduction by 2030 would be 3.4%, because 0.92 * 1.05 = 0.966 or a 3.4% reduction from a 2022 base year.

RECALCULATION OF BASELINE LAND FOOTPRINT

Companies *should* seek to improve the quality of the data they collect over time, especially due to changes within the company. Based on such internal changes (outlined below and mirroring the GHGP), a recalculation of the baseline land footprint shall take place (even while keeping the base year and target year constant). Recalculations must also take place based on any new versions of the Land targets.

Following the GHGP, recalculation is required when the following changes occur and have a significant impact on the total land footprint calculated:

- Structural changes in the reporting organization, such as mergers, acquisitions, divestments, outsourcing, and insourcing.
- Changes in calculation methods, improvements in data accuracy, or discovery of significant errors.
- Changes in the categories or activities included in the land footprint "inventory".

Purchasing companies *should* seek to work with their current suppliers to improve performance over time, rather than shifting to more-efficient (higher-yielding) suppliers. A strategy of shifting to higher-yielding suppliers carries social risks (potentially harming livelihoods of current suppliers), and/or potentially will not affect global agricultural land demand if other buyers just switch to purchasing from the company's current suppliers. Companies should consult Annex 2b and SBTN's Stakeholder Engagement Guidance to better understand how their actions or priorities may impact local stakeholders and how they can support and facilitate rights-based approaches to the implementation of the Land Footprint Reduction target.

2.3. Target validation and disclosure

To begin the target validation process, companies *must* submit to SBTN:

- ISIC sector classification(s) for activities within their direct operations and upstream.
- Number of employees (FTE).
- Disclosure of agricultural land footprint (from direct operations and/or from upstream impacts) in the base year.
- Activity amounts (quantities of land-based products produced or purchased) in the base year.
- Calculation details for base year land footprint (e.g., yield estimates used and sources; spatial data used and sources; any other statistical data used and sources).
- Calculation details for Land Footprint Reduction target (e.g., number of years in the target period between base year and target year; use of 0.35% linear annual absolute reduction rate; use of 1% linear annual intensity reduction rate).
- A rationale for the choice of absolute or intensity target.
- A narrative description of their strategy and potential response options for achieving their Land Footprint Reduction target, including the proposed approach to addressing potential risks associated with unsustainable intensification (e.g., focusing on areas with opportunities to sustainably improve agricultural productivity, reducing food loss and waste, shifting toward less-land-intensive agricultural products), and avoiding unintended social consequences (e.g., prioritizing work with existing suppliers—including smallholders—to improve yields and productivity rather than shifting away to higher-yielding suppliers). This description should specify the strategy and potential response options across the company's value chain as well as in specific landscapes where these trade-offs are likely to exist.
- Companies submitting both Land Footprint Reduction targets and Landscape Engagement targets are required to submit information to the SBTN Target Validation Team that specifies whether and how locations and/or commodities prioritized for Land Footprint Reduction overlap with landscapes selected for the Landscape Engagement target. As noted above, given the fact that companies will not always have ownership rights over any land freed up through the Land Footprint Reduction target, SBTN has not established requirements for companies to restore that land. Instead, the mechanism for driving restoration is through the Landscape Engagement target.

SBTN is assessing reporting requirements for companies that will set a Land Footprint Reduction target, which will be defined in upcoming guidance.

In the interim, in alignment with the draft GHGP Land Sector and Removals Guidance, SBTN recommends the below list of disclosure requirements for companies tracking their agricultural land footprint (called "land occupation" in the GHGP Land Sector and Removals Guidance) over time:

- Companies shall account for and report their agricultural land footprint on an annual basis.
- Companies shall apply their land footprint accounting methods consistently across their entire land footprint "inventory."
- Companies shall report agricultural land footprint of direct operations and of upstream impacts separately.
- Companies shall disclose the data sources, methods, and assumptions used to quantify agricultural land footprint.
- Companies may separate out their land footprint reporting by type of land use (e.g., cropland, pastureland), products produced or sourced, location, and/or ecoregion.

2.4. Template statement for Land Footprint Reduction target

Land Footprint Reduction targets will be stated in the following form:

Box 9: Formulation of Land Footprint Reduction target.

ABSOLUTE TARGET:
[Company name] commits to reduce absolute agricultural land footprint, from direct operations *[and upstream impacts]*, *[percent reduction]*% by *[target year]* from a *[base year]* base year.

INTENSITY TARGET:
[Company name] commits to reduce agricultural land footprint intensity, from direct operations *[and upstream impacts] [reduction]*% per *[unit]* by *[target year]* from a *[base year]* base year. This corresponds to a *[% change]* in absolute land footprint by *[target year]* from the *[base year]* base year."

2.5. Why is the Land Footprint Reduction target needed?

Expansion of agriculture, forestry, and other human land uses (e.g., mining, infrastructure) is the leading driver of natural ecosystem conversion, which in turn drives biodiversity loss and global warming and ultimately undermines the critical ecosystem services on which humans rely for protection, livelihoods, materials, food, and fresh water.[41, 42, 43]

Expanding human activity at the expense of natural ecosystems and biodiversity has historically been considered a precondition for economic development. However, there is an abundance of evidence that it is both possible and necessary to halt conversion of natural ecosystems and liberate hundreds of millions of hectares of agricultural land for ecosystem restoration, all while providing affordable and nutritious food for the growing global population.[44, 45, 46, 47, 48, 49] The Kunming-Montreal Global Biodiversity Framework targets, the Paris Agreement, and the Sustainable Development Goals all rely on transformation of land systems at this scale.

41 Winkler, K., Fuchs, R., Rounsevell, M., & Herold, M. (2021). Global land use changes are four times greater than previously estimated. Nature communications, 12(1), 2501.

42 https://www.fao.org/food-agriculture-statistics/en/

43 IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages.

44 Griscom, B. W., Adams, J., Ellis, P. W., Houghton, R. A., Lomax, G., Miteva, D. A., ... & Fargione, J. (2017). Natural climate solutions. Proceedings of the National Academy of Sciences, 114(44), 11645-11650.

45 https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/

46 Searchinger, T., Waite, R., Hanson, C., Ranganathan, J., Dumas, P., Matthews, E., & Klirs, C. (2019). Creating a sustainable food future: A menu of solutions to feed nearly 10 billion people by 2050. Final report.

47 https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf

48 Roe, S., Streck, C., Beach, R., Busch, J., Chapman, M., Daioglou, V., ... & Lawrence, D. (2021). Land-based measures to mitigate climate change: Potential and feasibility by country. Global Change Biology, 27(23), 6025-6058.

49 Leclère, D., Obersteiner, M., Barrett, M., Butchart, S. H., Chaudhary, A., De Palma, A., ... & Young, L. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. Nature, 585(7826), 551-556.

SBTN Land's Target 1: No Conversion of Natural Ecosystems is therefore fundamental for delivering nature, climate, and Sustainable Development Goals. However, it is also important to set targets to limit or decrease pressure on natural ecosystems by reducing the amount of land occupied by human activities and to free up land for ecosystem restoration. This is what the Land Footprint Reduction target seeks to achieve.

SBTN has focused this Version 1.0 Land Footprint Reduction target solely on agricultural land (including cropland and pastureland) since it is the world's largest use of land, and there is strong evidence (as summarized in Annex 2a) demonstrating the scale of reductions required in agricultural land occupation for nature and climate goals that provides a scientific basis for the target.

There is less clear evidence about the extent to which other land-intensive sectors would need to reduce their land footprints. SBTN may explore the applicability of this target-setting methodology for other major land users in the development of Version 2.0 SBTN Land targets. The scientific literature that underpins the Land Footprint Reduction target shows that transformation of land systems at the scale necessary to achieve global nature goals is only possible through more efficient and sustainable use of land, driven primarily by increased agricultural productivity, reduced food loss and waste across value chains, and more circular use of natural resources, and—in higher-income regions—shifts toward healthier, more sustainable and less-land-intensive diets.

Critically, the world will need to use all of the response options to avoid unintended consequences and to manage potential trade-offs between nature, climate, and Sustainable Development Goals. For example, the need to free up agricultural land for natural ecosystem restoration to achieve biodiversity and climate goals could either put local (or even global) food security at risk or lead to unsustainable forms of agricultural intensification that degrade land or water resources (e.g., through overuse of fertilizers and chemical inputs). Company strategies must therefore be underpinned by social and environmental safeguards and strong global and local governance. Annex 2b provides a more detailed discussion of how companies can manage trade-offs and unintended consequences through response option planning and social safeguards.

Target 3:
Landscape Engagement

This chapter of the SBTN Land Guidance sets out:

1. Information on what is a Landscape Engagement target.
2. Information on how to set, report, and communicate on landscape engagement.
3. Technical annexes and supplementary material articulating the scientific bases of the target and other supporting materials.

3.1. What is a Landscape Engagement target?

The intention of landscape engagement is to enable **regenerative, restorative, and transformational actions** in landscapes that are relevant for a company's operations and supply chains. The third Land target therefore complements Target 1 and Target 2, which are focused on the avoidance and reduction of impacts. This trio of Land targets incentivizes actions that span all categories of the SBTN AR3T Framework. Section 3.2.6, "Relationship with other land, climate, and freshwater targets," presents a more detailed overview of the interconnection that exists between the three Land targets, biodiversity, and climate and freshwater science-based targets.[50]

The importance of landscape-scale engagement is that it allows for the consideration of multiple objectives of multiple stakeholders, including nature. Since most landscapes that are material to a company involve a matrix of different non-natural and natural land cover and use, a landscape-scale engagement helps to determine larger-scale impacts and dependencies among land-use types and the stakeholders (including nature) that rely on natural resources or processes. Working at the landscape scale to understand the landscape condition, constraints, and trajectory is the prevailing approach to a theory of change that will allow for a safe and just future for humanity in nature.

While all the targets included in the current version of this guidance will evolve based on the more-refined methods of the next version of science-based targets for land (Version 2.0), the **Landscape Engagement target will evolve to include much greater specificity for companies in directing actions that consider place-based characteristics**. The Landscape Engagement target allows companies to make progress now on the next version of the Land targets.

Future versions will include quantitative metrics for selected land extent and condition indicators that will be regionally emergent and relevant. For each of the indicators of land condition, SBTN will identify spatially explicit, place-based thresholds that will provide the scientific basis on which companies will set locally and globally relevant Land targets.

While the development of this science continues, the current Landscape Engagement target is focused on company commitment in landscapes linked to their direct operations or supply chains that will result in a substantial increase in ecological and social benefits, while creating the enabling environment for achieving these goals. The current Landscape Engagement target uses existing landscape initiatives as a vehicle to guide the implementation of corporate actions that must be deployed collectively and at scale to support corporate Landscape Engagement targets. The urgency of biodiversity loss and land degradation, and the need for collective action at a landscape scale, now outweighs the importance of precise measurement in the interim.

For this reason, the Landscape Engagement target is broad by design and encompasses a variety of potential actions that companies and other stakeholders can implement for achieving holistic, multi-objective environmental, biodiversity, and social outcomes.

50 The Landscape Engagement target requires elements that are fully compatible and complementary with the locate, evaluate, assess, and prepare (LEAP) approach and guidance of the TNFD. Nature target setting is a step in the LEAP process and TNFD recommends science-based targets for nature where applicable. Critically, the SBTN Landscape Engagement target setting is a means for companies to go beyond assessment and implement their learnings from the LEAP process, to act on the risks and opportunities identified and track impacts and improvements at landscape scale—beyond their individual supply chains. Furthermore, landscape engagement can help companies going through the LEAP assessment process as it enables access to existing data from monitoring and information landscape systems, identifies best practices for targeted landscapes, and builds on previously established conservation/restoration efforts.

The Landscape Engagement target requires companies to:

1. Engage in either
   - One landscape initiative that is equivalent to a **10% coverage of the company's estimated land impact area footprint**.
     - The 10% coverage is recommended following the SBTN Step 2 Guidance, which recommends companies to use the outcome of their land-use target boundary rankings (combined with biodiversity) and to address the top 10% of areas within the target boundaries for land use and change and soil pollution.
     - The prioritized list of Step 2 should include, for each target boundary, sites that cover at least 10% of the total direct operations and upstream target boundaries (respectively).

   OR

   - Two landscape initiatives, regardless of their size, in materially relevant landscapes.
2. Select landscapes following the two approaches to selection of material landscapes listed in section 3.2.1.
3. Evaluate the prioritized landscape initiatives ensuring that these initiatives comply with the key criteria for validated landscape initiatives identified in section 3.2.3.
4. Commit to a substantial improvement of the ecological and social condition and metrics of the landscape.
5. Develop an action plan for engagement in the landscape(s).

For companies that are already investing in landscape initiatives, landscape engagement may provide a simplified, integrated framework for quantifying and recognizing such contributions. However, the extent to which existing company actions within landscape initiatives contribute toward their science-based target depends first on their materiality to the landscape. Actions taken in landscapes that are only site-based and/or not materially relevant to a company cannot satisfy the requirements of the Landscape Engagement target.

Additional guidance for companies on what constitutes a landscape investment or action that could be recognized by SBTN is provided by ISEAL and outlines that the landscape investment or action:

- addresses critical sustainability issues in the landscape and contributes to agreed landscape goals;
- aims to have impacts beyond individual supply chains;
- includes support to multi-stakeholder landscape coordination processes;
- is embedded in collective action plans, ensuring complementarity with other activities and interventions in the landscape; and
- contributes to broader systems level change, helping to create the enabling conditions for achieving agreed landscape goals.

Therefore, companies that are already involved in selected landscape initiatives must demonstrate both the materiality and quality of landscape initiatives in which they are currently engaged as well as the minimum land impact area coverage. It is also important that a commitment to Landscape Engagement under SBTN represents an acceleration of ambition, not only a recognition of the existing engagement of companies in landscape initiatives. Here, demonstrating additionality is also key, but not prescriptive, such that increased engagements in existing material landscapes would likely qualify.

When landscape initiatives are not present in any of the prioritized locations or they do not meet the key criteria, companies can rely on their roadmap documentation showing the planned steps to meet the criteria or they can develop new landscape initiatives.

SOCIAL, HUMAN, LAND RIGHTS

All actions proposed within a landscape initiative must adhere to social safeguards and follow best practices with respect to human rights and the recognition of Indigenous Peoples and other impacted/affected stakeholders. Companies must respect the rights of Indigenous Peoples to free, prior, and informed consent and engage with stakeholders as equals rather than only as beneficiaries. Companies engaged in science-based targets must attempt to include all relevant stakeholders in the process. The respect for human rights and effective and informed participation is crucial for any landscape initiative's success (see also Proforest, 2023).[51] For additional guidance please see SBTN's Stakeholder Engagement Guidance.

SBTN also recognizes that ambitious land targets may bring with them risks of limiting vulnerable producers' and smallholders' opportunities to benefit from corporate supply chains and associated resources. For this reason, it is important that desired conservation/regeneration outcomes and the equity and rights of local producers and smallholders in their access to markets are recognized, and potential perverse social outcomes are evaluated as part of the target validation process and continuously reevaluated as companies make progress on their target.

Therefore, companies should include a preliminary assessment of the potential consequences of their actions to be implemented in landscape initiatives in their target documentation, to identify any potential for negative or unintended impacts on people and the environment. Engagement within a multi-stakeholder process can expose companies to stakeholders that may more clearly see such risks and is a clear benefit of broad stakeholder engagement within a landscape context as part of a landscape initiative. Here, companies can be more aware of potential trade-offs and consider whether these trade-offs are acceptable or not within the context of the landscape initiative and land targets.

In the latter case, steps need to be taken to avoid or mitigate these unacceptable outcomes. The company should then be able to better communicate about any trade-offs and the steps taken to avoid or mitigate any unacceptable outcomes (see also ISEAL, 2023).[52]

51 Respecting Rights of Indigenous Peoples and Local Communities in Landscape Initiatives: A Guide for Practitioners on Minimum Safeguards and Evolving Best Practices. 2023. https://www.proforest.net/fileadmin/uploads/proforest/IPLCs_in_Landscape_Initiatives.pdf

52 https://www.isealalliance.org/get-involved/resources/joint-landscape-position-papers-20222023

3.2. How to set a Landscape Engagement target

All companies required to set a Landscape Engagement target (see section i, "How to determine if your company must set Land targets") must follow this summarized procedure to identify target requirements and prepare all required materials to be submitted for target validation.

1. **Selection of landscapes for engagement**
   - Use one of two approaches (outlined in more detail in section 3.2.1 below) for prioritization of landscapes:
     - Approach 1: Choosing landscapes for engagement in connection with SBTN Steps 1 & 2 and in connection with a Land Footprint Reduction target.
     - Approach 2: Choosing landscapes for engagement in connection with a No Conversion of Natural Ecosystems target.
   - Evaluate existing candidate prioritized landscape initiatives against the Maturity Matrix and key criteria for landscape investments and actions.
   - Calculate % coverage of land use impact of selected initiatives.
   - If, while selecting landscapes for engagement, companies are not able to find an existing landscape initiative in prioritized landscapes, they can set up new initiatives following the key criteria to be validated in the target validation process.

2. **Commit to substantial improvement of ecological and social conditions in the landscape**

   This commitment must be in line with the selected landscape initiative objectives and material land impacts. Companies commit to substantially increase ecological and social conditions at the landscape level for the selected landscapes using recommended metrics and stakeholder-defined landscape initiative objectives. Calculating the baseline information on selected landscapes is not a requirement for setting a Landscape Engagement target but it is necessary to demonstrate progress on this target.

3. **Develop an action plan for engagement in the landscape**
   - Companies commit to develop and/or contribute to collective actions within landscape initiatives.
   - Companies assess the potential negative social or environmental impacts from their potential engagement in the landscape.
   - Companies should choose appropriately aligned indicators to measure and track progress in their landscape initiatives.

4. **Target validation**

   A company is ready to submit its data for target validation (see section 3.3, "Target validation and disclosure"). Once the target is approved, a company can make a public statement as outlined in the SBTN claims guidance.

3.2.1. Selection of material landscapes—two approaches

Two main approaches are outlined in Table 13 on next page. They provide guidance on how a company will prioritize landscapes for engagement:

APPROACH 1. CHOOSE LANDSCAPES FOR ENGAGEMENT IN CONNECTION WITH SBTN STEPS 1 & 2

For companies who have low levels of conversion in their operations or supply chains, landscape engagement should be prioritized using Steps 1 & 2 of SBTN's guidance. This approach must be followed also by companies that are required to set a Land Footprint Reduction target.

After using the SBTN methods for Step 1: Assess and Step 2: Interpret & Prioritize, companies will have already estimated their value chain pressures and know where these are occurring.

Using the pressure estimates generated for those sector activities or high-impact commodities for land use (km2) and the associated states in the Step 1b: Value Chain Assessment, companies can choose the landscapes within which to set Landscape Engagement targets in several ways.

Table 13: Two approaches for selecting material landscapes.

Approach 1 Choosing landscapes for engagement in connection with SBTN Steps 1 & 2 and in connection with a Land Footprint Reduction target	This approach is for companies who **have low levels of conversion in their operations or supply chains and for those who have to set a Land Footprint Reduction target**. This approach links back to analysis carried out in Steps 1 & 2 of the SBTN methodology.
Approach 2 Choosing landscapes for engagement in connection with a No Conversion of Natural Ecosystems target.	This approach is suitable for companies with **significant amounts of conversion** within their operations or supply chain.

1. **For companies who are only setting SBTN Land targets**, it is recommended that they use a combination of impact of land use area and state of nature assessment approach to determine the top-ranked landscapes for which to set Landscape Engagement targets.
    a. Using the outputs of Step 1b and Step 2, rank landscapes using:
        i. land use area (km2); and
        ii. any combination of terrestrial ecosystem state of nature (pressure-sensitive and biodiversity) metrics (e.g., extent of natural ecosystems, species threat abatement and restoration (STAR) metric) to rank landscapes for potential engagement.
    b. Choose a % land area coverage based on the land use area for the company supply chain as appropriate to the company supply chain position.
        i. We recommend at least 10% coverage out of the land use area of the supply chain of a company for a validated target.
        ii. The number may be higher for production-side companies and lower for demand-side companies.
        iii. In the validation form, companies should disclose the approach to landscape selection and % coverage including a justification statement for each.
        iv. As noted in target validation requirements, when the percentage of coverage is 10% or more of the total land use area, then the requirement on coverage is satisfied. Otherwise, a company must engage in an additional landscape initiative, for a total of two, and will satisfy the requirement regardless of the coverage.
2. **For companies who are setting multiple targets across water, land, and climate**, we recommend an impact on multiple pressures with a state of nature assessment.
    a. Companies should follow the same approach as outlined above, but also **add priority water basins or climate impact landscapes to the analysis to maximize multiple benefits across targets, as suggested in Step 2.**
    b. Companies will need to concentrate resources across multiple areas of activity—this approach allows them to get to scale.
    c. Companies should still be transparent about the % coverage and rationale of their land use estimates and state of nature assessment; however, we recognize that the coverage may be lower if choosing to focus on places that provide multiple outcomes.

Note: The Land Footprint Reduction target does not mandate that the lands taken out of production are restored to natural lands since these methods cannot hope to capture the tenure and rights contexts of all such lands in addition to other data constraints. That said, restoring lands taken out of production is a worthy goal in many contexts, including as a contribution to a Landscape Engagement target. In addition, a Landscape Engagement target can help companies and other stakeholders link goals to sustainably boost productivity with goals to protect and/or restore natural ecosystems in critical landscapes.

Companies who set a Land Footprint Reduction target *must* use the Landscape Engagement target to align lands removed from production with local or regional landscape initiatives, as well as the biodiversity (CBD), climate (UNFCCC), and land degradation (UNCCD) agendas over time.

Box 10: Example for selection of landscapes using Approach 1.

For companies who have a low land footprint or already have advanced significant sustainability improvements on their sourcing lands (e.g., 100% Forest Stewardship Council certification on fiber sourced), it may be more appropriate to prioritize landscapes using the state of nature assessment.

To comply with this approach, companies should complete the assessment in Step 1b and Step 2, and document for each landscape the improved land management practice or landscape investments already completed in that landscape. Then use the state of nature criteria to select landscapes for engagement and document the rationale. Please note that this approach will be accepted for the next 1-2 years of SBTN Land targets.
Once Version 2.0 is launched with the thresholds and translational science to link outcomes to corporate actions, a company may need to come back and assess whether the sustainable management activities it has implemented on its sourcing lands are, in fact, enough. This could result in a recalibration of activities on sourcing lands to align them with the necessary global biodiversity and nature outcomes.

Companies should report on the % of their land footprint that each landscape initiative is estimated to cover in their validation submission and track and disclose changes in land footprint related to those landscape initiative(s) over time.

APPROACH 2. CHOOSE LANDSCAPES FOR ENGAGEMENT IN CONNECTION WITH A NO CONVERSION OF NATURAL ECOSYSTEMS TARGET

The No Conversion of Natural Ecosystems target requires companies to **commit to achieving no conversion across their operations and supply chain volumes** and to make and disclose progress toward that goal. Following this approach companies will select landscapes based on the assessment of conversion that occurred between the cutoff date and the date their No Conversion target is set. These should be landscapes that exhibit the highest levels of ecosystem conversion.

Landscape initiatives and collaboration between multiple stakeholder groups can help companies in their efforts to achieve Target 1: No Conversion of Natural Ecosystems.

Additionally, collective action in landscape initiatives, such as between producers of conversion-driving commodities, sourcing companies, and local communities and administrations, can support the remediation of land that was converted post cutoff date. Please see section 3.2.6 for further elaboration on how landscape initiatives can support the achievement of Target 1 on No Conversion of Natural Ecosystems.

3.2.2. Screening of landscape readiness—Maturity Matrix

CDP, in collaboration with the SBTN Land Hub, ISEAL and LandScale, developed the landscape Maturity Matrix, where the concept of maturity is used to understand whether an initiative contains the elements necessary for lasting positive impact and resilience over time. CDP's Maturity Matrix provides a valuable framework for assessing the quality of disclosure data and enabling organizations implementing or supporting landscape initiatives to gain a better understanding of the minimal elements of what constitutes a credible disclosure of corporate engagements in landscape initiatives.

This understanding is essential to determine the credibility and quality of the way that a corporate is engaging in a landscape initiative. The Maturity Matrix (see Table 14) is built on the core principles of landscape and jurisdictional initiatives[53] and the key characteristics of effective corporate engagement.

53 Sayer, J. et al. (2013). Ten principles for a landscape approach to reconciling agriculture, conservation, and other competing land uses. Proceedings of the National Academy of Sciences, 110(21):8349–8356.

The key criteria outlined in the Maturity Matrix guide companies setting a Landscape Engagement target in assessing and prioritizing landscape initiatives for their engagement. More broadly, the Maturity Matrix can guide company investment and action in landscape initiatives and stimulate the adoption of transparent reporting systems through which a company can demonstrate its contribution to the actions and processes that form the core of the initiative.

The key criteria are based on:

1. The scale of the initiative.
2. The involvement of multi-stakeholder groups in the process.
3. The identification of collective goals and action and investments to be deployed collectively to achieve the goals.
4. The presence of a transparent reporting or information system.

Three broad levels of maturity have been defined, considering the four criteria outlined above with more detailed descriptions of each in Table 14:

Comprehensive

- The landscape or jurisdictional approach is robust and at a stage of maturity to deliver lasting sustainability outcomes at the scale of the landscape in question.
- Companies engaging in comprehensive initiatives should be able to demonstrate that the initiatives fully incorporate all four criteria of landscape and jurisdictional approaches. The landscape or jurisdictional initiative is robust enough or at a stage of maturity to deliver lasting sustainability outcomes based on the collective goals in the landscape or jurisdiction in question.
- Companies engaging in comprehensive landscape and jurisdictional initiatives should demonstrate that the initiatives have adequate conditions for the maintenance/permanence of those elements secured in time.

Partial

- The initiative is in an early or middle stage of development and demonstrates that it is progressing steadily toward maturity.
- The initiative should comply with the first criteria of scale and companies should be able to demonstrate that actions or investments are supporting the progress toward complying with the three additional criteria.

Uncertain

- The landscape or jurisdictional approach does not qualify as credible or mature.
- Initiatives not qualifying either do not operate at the scale of a recognized geographic, administrative, or ecological boundary (e.g., are exclusively site-based), or do not demonstrate evidence of addressing or planning to address the additional three criteria.

Table 14: Landscape and jurisdictional Maturity Matrix.

Criteria	Operation at the scale of a landscape or jurisdiction	Multi-stakeholder process/platform	Collective goals and actions	Transparent reporting or information system
Comprehensive	Scale of initiative corresponds to a recognized geographic, administrative, or ecological boundary. E.g., the initiative works in a subnational jurisdiction partnership between three municipalities that support the management of a watershed.	Several local stakeholder groups (civil and government) are organized and involved in the design, implementation, and monitoring. Gender, age, and local and Indigenous community representativity is ensured and effectively included. E.g., NGOs, local and Indigenous communities, local governments, and the private sector regularly meet to collaborate and discuss the progress and next steps on the initiative.	Stakeholders have defined collective goals related to human wellbeing, sustainable production (e.g., of high-impact commodities), biodiversity, and landscape conservation. Collective actions and investments are making progress against the defined goals. E.g., the landscape stakeholders have agreed on their collective goals and actions for sustainable development, using collaborative workshops for goal and target setting in early project stages.	Assessment baseline and progress at the landscape scale is tracked by several involved stakeholders and is publicly reported through an information system. E.g., the company supported the establishment of an assessment baseline using a recognized global assessment and is now supporting an independent monitoring system for the initiative that transparently tracks progress against the collective goals.
Partial	Scale of initiative corresponds to a recognized geographic, administrative, or ecological boundary. E.g., the initiative works in a subnational jurisdiction partnership between three municipalities that support the management of a watershed.	Some stakeholder groups are involved. E.g., the company collaborates with an NGO that is supporting the landscape partnership, with no local representation or collaboration with government.	Actions go beyond internal company objectives and are determined by some stakeholders or are planned to be developed collaboratively. E.g., a company supports the initiative to improve its traceability and certification strategy, while also having a designated conservation area.	Actions are reported by some stakeholders.
Uncertain	Area of initiative is limited to specific sourcing plots/ plantations of company interest, covers several geographically distinct and separate boundaries, or does not describe any boundary.	Only the reporting company is involved in the initiative. No additional stakeholder groups participate in the initiative.	Only internal company objectives are included, or holistic goals have not yet been determined. E.g., selected goals and qualitative responses only address production/ productivity goals.	Only the reporting company carries out monitoring and internal reporting for its own goals; there is no collective information system in place.

3.2.3. Key criteria for validated landscape initiatives and self-assessment

The key requirements of landscape initiatives for target validation are:

1. **Criterion 1** The boundary that the landscape initiative is aiming to exert influence over follows the boundary of either a jurisdiction, watershed, or another area considered to be of ecological or socio-economic importance. When the area is not defined following ecological, jurisdictional, or water-basin boundaries, then the area must be at least 10,000 ha.
2. **Criterion 2** The visions and needs of relevant stakeholder groups must be included in the design, implementation, and monitoring of an initiative.
    a. At least three stakeholder groups have participated in one or more phases of the landscape initiative.
    b. A written collaboration agreement has been developed and signed by participating landscape stakeholders to formalize the partnership.
3. **Criterion 3** There are collective objectives and actions for nature and people.
    a At least three landscape objectives have been identified, including at least one environmental objective and one social objective. Each objective includes a specific, measurable milestone that the initiative aims to achieve by a specific date e.g., reduce deforestation by 20% in relation to the 2020 baseline by 2030.
    b. A collective action plan that aims to contribute to meeting the defined landscape objectives has been developed and is publicly available.
4. **Criterion 4** There are transparent reporting and presentation/information systems sharing the actions/investments made in the initiative.
    a. Regular reports are produced to describe the progress and setbacks in implementing the activities included in the action plan.
    b. A baseline assessment of the ecological and social condition of the landscape has been conducted and is publicly available. This should include at least one indicator that is relevant to each landscape goal.
    c. A time-series including at least two results (the baseline result and one more-recent result) is publicly available for all indicators included in the baseline assessment.
    d. All results included in the baseline assessment of landscape performance, or subsequent assessments of landscape performance, have been validated by an entity with some degree of independence from those involved in conducting the assessment and the landscape initiative.

The key criteria of landscape initiatives presented in the previous section inform the key requirements that the landscape initiative selected for engagement and presented for target validation must fulfil.

SBTN *recommends* that companies:

- engage in initiatives that are not yet mature and follow the guidelines provided in this chapter and in supplementary material for improving the maturity of the initiatives; and
- establish new landscape initiatives beyond target requirements, as multi-stakeholder, collective action will be crucial in achieving science-based targets for nature at scale.

By assessing the initiative(s) with the four criteria above, the company might fall into three different scenarios, listed below. For each scenario, the company will have to provide a list of documents, called roadmap documents. The three scenarios are:

- **Scenario 1: the landscape initiative is present and it meets all four of the key criteria**
    - In this case, the landscape engagement roadmap information needs to be comprehensive in showing the structure and governance, but most importantly it needs to document how the company is planning to achieve the improvements in ecological and social conditions.

- The actual linkage of actions to results will be part of Step 4, but in this phase the company needs to build the baseline for the landscape initiative and still provide accurate information on its presence in the initiative.
- The information needs to include the list of selected metrics and indicators (part of the list below) for the whole area that the landscape initiative is working to influence, so that the company can then demonstrate the improvement of its investment to the overall landscape (e.g., restoration, regeneration, improvement of ecological conditions, etc.).

- **Scenario 2: the landscape initiative is present but the structure/governance does not meet all the key criteria**
  - In this case, the roadmap information needs to include:
    - How to improve the governance and structure of the initiative, in order to meet the key criteria.
    - How to achieve ecological and social conditions.
  - Some requirements of the roadmap information are less strict in this case, since initiatives might not have all the documentation ready and/or might still miss certain governance/transparency, which the company is working on.

- **Scenario 3: the landscape initiative is present but it does not meet any of the key criteria, or the landscape initiative is not present and the company starts a new initiative**
  - For a current initiative, the roadmap information needs to include all the steps the company will take to meet the key criteria.
  - For a new initiative, the roadmap information needs to include the steps the company is working on to set up a new initiative that will meet the key criteria.

Companies must complete a self-assessment of whether the landscape initiative they have selected fulfils the four key criteria listed below. This is a binary assessment conducted for each criterion individually:

- Criterion 1. Does the landscape initiative fulfil this criterion? *Yes or No*
- Criterion 2. Does the landscape initiative fulfil this criterion? *Yes or No*
- Criterion 3. Does the landscape initiative fulfil this criterion? *Yes or No*
- Criterion 4. Does the landscape initiative fulfil this criterion? *Yes or No*

If the answer to all four criteria is Yes, then the company can determine that the landscape initiative falls under scenario 1.

If the answer to at least one but not all of the criteria is No, then the company can determine that the landscape initiative falls under scenario 2.

If the answer to all of the criteria is No, then the company can determine that the landscape initiative falls under scenario 3.
Validators will ask for evidence that the self-assessment has been completed.

3.2.4. Landscape engagement roadmap—what is required based on each landscape scenario

In Annex 3, companies will find all information and documentation to complete the landscape engagement roadmap.
Companies will find a table with each requirement matched with the key criteria listed above. Please note that some information and documentation is covering more than one key criterion.
The landscape engagement roadmap has been built by integrating the most up-to-date information and principles from experts and organizations active in landscape initiatives globally.

3.2.5. Establishing and improving landscape initiatives

In situations where the landscape initiatives prioritized do not meet the criteria for validation or when landscape initiatives are not present in the prioritized locations, companies can either present an action plan and work toward changing the initiatives for compliance against the Maturity Matrix, or they can develop new landscape initiatives by following the list of key criteria and working toward an improvement plan along the Maturity Matrix. In general, companies should seek to improve conditions in the landscape as a whole and in alignment with landscape objectives, rather than work only for a specific set of producers or enterprises. Landscape investments and actions should complement supply chain investments by creating a more resilient environment and better conditions for the long-term wellbeing of local communities.

To make sure landscape initiatives achieve their objectives, companies can initiate or contribute to a varied range of activities and actions in collaboration and alignment with a landscape initiative. Companies' actions can range from avoidance and reduction of pressures on biodiversity and nature loss, to restoration and regeneration of the state of nature (e.g., the extent and integrity of ecosystems and species extinction risk), and the transformation of underlying socio-economic systems at multiple levels to address the drivers of degradation and nature loss. All of these approaches will be instrumental in successfully achieving landscape-scale objectives.

3.2.6. Relationship with other land, climate, and freshwater targets

All of the SBTN Land targets are designed to work together to incentivize the action and engagement that companies will implement to contribute to regional and global nature goals. These actions span all categories of the SBTN AR3T Framework. Companies that engage in material landscapes will avoid the conversion of natural ecosystems in line with the first Land target and Approach 2 for their Landscape Engagement target. Large agricultural companies that are required to set a Land Footprint Reduction target will link the land taken out of production with the broader landscape goals as defined by landscape initiatives in which they engage. Companies that are required to set all three of the Land targets should be able to demonstrate how these targets work together within a landscape scale, even if additional actions on No Conversion of Natural Ecosystems and Land Footprint Reduction take place across their entire value chains.

LANDSCAPE ENGAGEMENT AND TARGET 1: NO CONVERSION OF NATURAL ECOSYSTEMS

Engaging in landscape initiatives through collective actions will help companies in their efforts to achieve Target 1: No Conversion of Natural Ecosystems.

Landscape engagement is widely considered to be a key success factor for tackling deforestation and conversion of natural ecosystems[54][55] by addressing local drivers of conversion, driving collective action, ensuring that efforts to halt the conversion of natural ecosystems also deliver outcomes for local communities and biodiversity, and reducing the risk of leakage, for example by:

- bringing together companies from different sectors
- expanding action beyond the scale of individual operational sites
- building partnerships with local communities and with local administration
- considering local needs
- protecting livelihoods and human rights
- planning collectively for land use
- providing choices that protect or restore species, genetic diversity, and remaining natural ecosystems
- remediating conversion since the cutoff date.

54 https://www.theconsumergoodsforum.com/news_updates/landscape-engagement-is-key-to-tackling-deforestation-says-cgf-sustainability-director/

55 http://forestsolutions.panda.org/solutions/landscape-approaches

LANDSCAPE ENGAGEMENT AND TARGET 2: LAND FOOTPRINT REDUCTION

Companies that set a Land Footprint Reduction target must appropriately balance the need to use land more efficiently with avoiding unsustainable forms of agricultural intensification (e.g., overuse of fertilizers and chemical inputs) that would reduce the ecological integrity of the landscape and would therefore conflict with outcomes of the Landscape Engagement target.
Landscape engagement offers a framework in which the land freed up to achieve a Land Footprint Reduction target is used for achieving broader nature and climate goals. For instance, it may be possible to ecologically restore land removed from agricultural production, which can have positive impacts on ecological integrity, biodiversity, soil quality, and freshwater quality, and can increase carbon sequestration if well balanced with local needs.

It follows that, in the context of landscape engagement, a company's efforts to reduce its land footprint and/or increase agricultural productivity can support the achievement of other environmental goals for which it can gain recognition. For instance, where data are available and where there is a clear link to a landscape-level initiative, companies can report how many hectares are liberated for nature, for the establishment of ecological corridors, the increase of ecosystem connectivity, the support of human rights to cultural heritage, restoration or historical tenure, in support of human health, or many other possibilities. The company can also show how its actions are contributing to food security while simultaneously contributing to ecosystem protection and restoration in important landscapes.

LANDSCAPE ENGAGEMENT AND CLIMATE TARGETS

The Land targets can support the achievement of climate targets (see Annex 3 for a preliminary overview of action that can positively contribute to the achievement of multiple targets) and limit trade-offs and unintended consequences that could emerge from the implementation of climate action without the consideration of impacts that this may have on nature. The integration of climate and nature at the target-setting level incentivizes approaches that can assess trade-offs and find optimal solutions to corporate investments in nature and climate targets. For example, a climate-only lens might lead to fast-growing, monoculture, non-native tree planting for rapid carbon sequestration where land is relatively cheap (i.e., the biodiversity-rich tropical belt). This may have disastrous impacts on water availability, biodiversity loss, and resilience.

The Landscape Engagement target can help ensure that activities such as restoration, even if undertaken primarily for climate objectives, are linked with what both nature and people need in a specific landscape.

RELATIONSHIP WITH FRESHWATER TARGETS

The Landscape Engagement target can also form an integral part of the target-setting process of the SBTN Freshwater targets. If a company is planning to set a Landscape Engagement target in the same basin where it is using a local model to set Freshwater Quantity/Quality targets, then it should first follow the necessary steps for setting a Freshwater target, by following sections 3.1.2 and 3.1.3 of the SBTN Freshwater Guidance. When using a local model for Freshwater targets, in fact, a company is setting freshwater targets that are based on hydrological and/or freshwater quality models specific to a given basin (i.e., developed for that basin). These are paired with locally based thresholds, emphasizing those which are recognized by the local basin management authority or water resources management agency. Stakeholder engagement is a critical part of ensuring that the model and threshold chosen are appropriate and compatible with corporate data, and it therefore strongly aligns with and complements several requirements of the Landscape Engagement target in this guidance.

Companies should make sure they provide the necessary Freshwater documentation as part of their validation submission, before continuing with the Landscape Engagement target.

3.3. Target validation and disclosure

To begin the target validation process, companies must submit to SBTN:

1. ISIC sector classification(s) describing their direct operations and upstream activities.
2. Data required in section ii, "Data requirements to set Land targets".
3. Demonstrated engagement with one landscape initiative that covers 10% of land use impact (as defined in Step 2) OR demonstrated engagement in two landscape initiatives.
4. Descriptive rationale of the process chosen for the selection of priority landscapes.
5. Results of the screening of readiness status of landscape initiatives selected using the Maturity Matrix (see section 3.2.2). Landscape initiatives must satisfy the following key requirements:
    i. Operate at the scale of a recognized ecological area (such as a watershed or land ecosystem) or administrative area (such as states, provinces, municipalities, districts).
    ii. Include the needs of relevant stakeholder groups in the design, implementation, and monitoring of an initiative.
    iii. Have clear collective goals that go beyond a company's objectives and are determined through a multi-stakeholder process.
    iv. Have transparent reporting and presentation/information systems sharing the actions/investments made in the initiative.
6. Demonstrated engagement within an iterative process of stakeholder consultation that includes relevant parties as needed.
7. Evidence that an adequate and impartial assessment of the needs of local communities has taken place within this stakeholder consultation.
8. Alignment of corporate actions with community needs and objectives resulting from the stakeholder consultation process.

3.3.1. List of potential metrics—baselining for ecological and social conditions

SBTN acknowledges the variety of indicators, metrics, and indexes that can be used to assess ecological and social conditions in landscapes. While further scientific development and ground testing are needed to identify a specific set of indicators to inform the next version of Land targets based on spatially explicit thresholds, companies setting a Landscape Engagement target will assess the use of an appropriate set of metrics to be selected according to the needs of specific locations and in collaboration with other stakeholder groups involved in the initiative. Companies should therefore be able to define and select local metrics to report on key issues for the local context.

Below in Table 15, a non-exhaustive list of potential metrics is presented.

The list has been compiled based on availability and usability, and it is the outcome of a selection from SBTN methods and several commonly used landscape assessment frameworks, such as LandScale Assessment Framework,[56] Restoration Opportunities Assessment Methodology (ROAM),[57] and Landscape Reporting Framework from GCF.[58] The list also includes metrics from the CBD's Global Biodiversity Framework monitoring guidance.

56 https://www.landscale.org/assessment-framework/

57 https://www.wri.org/research/restoration-opportunities-assessment-methodology-roam

58 https://www.proforest.net/fileadmin/uploads/proforest/Documents/Landscape_Action_Progress_Reporting_Framework_2022.pdf

Table 15: List of potential metrics for ecological and social conditions.

Indicator	Topic	Metric
1.1	Ecosystems	Proportion of target boundary A land area under productive and sustainable land management.
1.2	Ecosystems	Total area (ha) within the engaged landscape(s) of natural lands converted since 2020 (SBTN Natural Lands Map).
1.3	Ecosystems	Total area (ha) "under restoration" in the landscape.
1.4	Ecosystems	Coverage (in % out of total area in the landscape) of protected areas and other effective conservation measures (OECMs).
1.5	Ecosystems	Total area (ha) and percentage (%) of natural ecosystems in the landscape that are currently degraded.
1.6	Ecosystems	Biodiversity risk assessment including dependencies and impacts using WWF's Biodiversity Risk Filter.
1.7	Ecosystems	Water risk assessment using the WWF Water Risk Filter or WRI Aqueduct.
1.8	Ecosystems	Species threat abatement and restoration (STAR) score at the landscape scale (using freely available 5 km2 resolution data).
1.9	Ecosystems	Species threat abatement and restoration (STAR) score at the landscape scale (using finer resolution data through data purchased through an Integrated Biodiversity Assessment Tool subscription).
1.10	Ecosystems	Services provided by ecosystems or an assessment of critical natural assets.
1.11	Ecosystems	Total climate regulation services provided by ecosystems by ecosystem type (System of Environmental Economic Accounts).
1.12	Ecosystems	Carbon stocks and annual net GHG emissions, by land use category, split by natural and non-natural land cover.
2.1	Governance	Number of stakeholder groups involved, (e.g., representatives of local communities; representatives of producers; representatives of government; representatives of Indigenous Peoples (if applicable); others).
2.2	Governance	Type of governance implemented in the landscape initiative—full, equitable, inclusive, effective, and gender-responsive representation and participation in decision-making, including a gender-action plan.
2.3	Governance	Number of unresolved land and resource conflicts or grievances,[61] and the area of land (ha) subject to such conflicts.
2.4	Governance	User-defined metric(s) on access and use rights for key natural resources in the landscape.
2.5	Governance	Number of stakeholder organizations with full, equitable, inclusive, effective, and gender-responsive representation and participation in decision-making, including a gender-action plan.
2.6	Governance	Proportion of total adult population with secure tenure rights to land, (a) with legally recognized documentation, and (b) who perceive their rights to land as secure, by gender and type of tenure.
3.1	Health and Wellbeing	Percentage (%) of female and male population living below the local poverty line (or, if this is not specified, earning <$1.90/day).
3.2	Health and Wellbeing	Percentage (%) of girls and boys who are undernourished.
3.3	Health and Wellbeing	Percentage (%) of households without electricity.
3.4	Health and Wellbeing	Number of farmers realizing additional benefits and income streams.
3.5	Health and Wellbeing	Percentage (%) of households without access to safe drinking water within a 15-minute walk from home.

59 For good practice of grievance mechanism, please also see: https://www.isealalliance.org/get-involved/resources/grievance-mechanisms-briefing-note-twentyfifty-bonsucro-rjc

In addition to the potential metrics listed above, companies may also consider the use of composite indexes to measure the ecological condition in landscapes, such as the Ecosystem Integrity Index (EII) and SEED Biocomplexity Index, among others.

The EII is being developed by UNEP-WCMC[60] and provides an index of the structure, composition, and function of ecosystems within a defined boundary.

SEED is a multi-composite index that monitors and measures biodiversity at scale, and it attempts to put together the variation that exists within species (genetic diversity), between species (species diversity), and across ecosystems (ecosystem diversity). Both indexes are currently under development and further guidance will be given in future versions of the guidance.

Crucial to the selection of an appropriate indicator is the ability and capacity of a company to measure progress in the landscape using the same indicator over the life of the target. The ability to track and measure progress against the metrics listed here will likely differ among landscapes. Therefore, it is essential that companies clearly evaluate and understand the long-term capacity of any of these metrics to change and be measured within the landscape and the target period.

60 Hill, S. L., Harrison, M. L. K., Maney, C., Fajardo, J., Harris, M., Ash, N., ... & Burgess, N. (2022). The Ecosystem Integrity Index: a novel measure of terrestrial ecosystem integrity. Biorxiv, 2022-08.

3.4. Template statement for Landscape Engagement targets

Landscape Engagement targets will be stated in the following form:

Box 11: Formulation of Landscape Engagement target.

> *[Company name]* is engaged in *[initiative name]* and committed to a substantial improvement in ecological and social conditions by 2030.

Annexes

Annex 1: No Conversion of Natural Ecosystems

a. Conversion-driving commodities list

Table 16: List of conversion-driving commodities with earlier target dates.

Soft commodities (with target dates aligned with EUDR and other standards)	Source
Cattle	Multiple sources
Cocoa	Multiple sources
Coffee	Hoang, 2021[61]
Oil palm	Multiple sources
Rubber	Multiple sources
Soybeans	Multiple sources
Timber/wood fiber	Multiple sources

Table 17: Additional conversion-driving commodities.

Soft commodities	Source
Avocados	Dryad, 2020[62]
Banana	Meyfroidt, 2014[63]; Jayathilake, 2021[64]
Beans	Phalan, 2013[65]
Buckwheat	Plowprint, 2022[66]
Camelina	Plowprint, 2022[67]
Canola	Plowprint, 2022[68]
Cassava	Phalan, 2013[69]; Jayathilake, 2021[70]; Pendrill, 2022[71]
Charcoal, commercial	Jayathilake, 2021[72]
Coconut	Dryad, 2020[73]; Jayathilake, 2021[74]
Cotton	Dryad, 2020[75]

61 Hoang, N. T., & K. Kanemoto. (2021). Mapping the deforestation footprint of nations reveals growing threat to tropical forests. Nature Ecology & Evolution, 5, 845–853.

62 Quantis, Dryad model for deforestation based on FAO production and crop expansion data. Accessed 2020 as part of project for WWF contract identifying the deforestation-driving commodities for Project Gigaton.

63 Meyfroidt, P. et al. (2014). Multiple pathways of commodity crop expansion in tropical forest landscapes. Environmental Research Letters, 9, 074012.

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66 WWF. (2022). PlowPrint Report.

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69 Phalan, B. et al. (2013). Crop expansion and conservation priorities in tropical countries. PLoS ONE, 8(1), e51759. doi:10.1371/journal.pone.0051759.

70 Jayathilake, H. Manjari, et al. (2021). Drivers of deforestation and degradation for 28 tropical conservation landscapes. Ambio, 50, 215–228.

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75 Quantis, Dryad model for deforestation based on FAO production and crop expansion data. Accessed 2020 as part of project for WWF contract identifying the deforestation-driving commodities for Project Gigaton.

Soft commodities	Source
Cowpeas	Phalan, 2013[76]
Grapes	Plowprint, 2022[77]
Groundnut	Phalan, 2013[78]
Maize	Multiple source
Millet	Phalan, 2013[79]
Mustard	Plowprint, 2022[80]
Onions	Plowprint, 2022[81]
Pineapple	Meyfroidt, 2014[82]
Potato	Plowprint, 2022[83]
Radishes	Plowprint, 2022[84]
Rice	Multiple source
Rye	Plowprint, 2022[85]
Safflower	Plowprint, 2022[86]
Sorghum	Phalan, 2013[87]
Speltz	Plowprint, 2022[88]
Sugarcane	Phalan, 2013[89]; Dryad, 2020[90]
Sugar beets	Plowprint, 2022[91]; Dryad, 2020[92]
Tobacco	SBTN HICL 2022[93]
Triticale	Plowprint, 2022[94]
Vetch	Plowprint, 2022[95]
Wheat	Multiple sources

76 Phalan, B. et al. (2013). Crop expansion and conservation priorities in tropical countries. PLoS ONE, 8(1), e51759. doi:10.1371/journal.pone.0051759.

77 WWF. (2022). PlowPrint Report.

78 Phalan, B. et al. (2013). Crop expansion and conservation priorities in tropical countries. PLoS ONE, 8(1), e51759. doi:10.1371/journal.pone.0051759.

79 Phalan, B. et al. (2013). Crop expansion and conservation priorities in tropical countries. PLoS ONE, 8(1), e51759. doi:10.1371/journal.pone.0051759.

80 WWF. (2022). PlowPrint Report.

81 WWF. (2022). PlowPrint Report.

82 Meyfroidt, P. et al. (2014). Multiple pathways of commodity crop expansion in tropical forest landscapes. Environmental Research Letters, 9, 074012.

83 WWF. (2022). PlowPrint Report.

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87 Phalan, B. et al. (2013). Crop expansion and conservation priorities in tropical countries. PLoS ONE, 8(1), e51759. doi:10.1371/journal.pone.0051759.

88 WWF. (2022). PlowPrint Report.

89 Phalan, B. et al. (2013). Crop expansion and conservation priorities in tropical countries. PLoS ONE, 8(1), e51759. doi:10.1371/journal.pone.0051759.

90 Quantis, Dryad model for deforestation based on FAO production and crop expansion data. Accessed 2020 as part of project for WWF contract identifying the deforestation-driving commodities for Project Gigaton.

91 WWF. (2022). PlowPrint Report.

92 Quantis, Dryad model for deforestation based on FAO production and crop expansion data. Accessed 2020 as part of project for WWF contract identifying the deforestation-driving commodities for Project Gigaton.

93 McCraine, S. et al. (2022). SBTN High Impact Commodity List, draft form. Excel file shared via email.

94 WWF. (2022). PlowPrint Report.

95 WWF. (2022). PlowPrint Report.

Hard commodities	Source
Bauxite	Luckeneder, 2021[96]
Coal, surface mining	Yu, 2018[97]
Copper	Luckeneder, 2021[98]
Gold	Luckeneder, 2021[99]
Iron	Luckeneder, 2021[100]
Lead	Luckeneder, 2021[101]
Manganese	Luckeneder, 2021[102]
Nickel	Luckeneder, 2021[103]
Palladium	SBTN HICL, 2022[104]
Platinum	SBTN HICL, 2022[105]
Silver	Luckeneder, 2021[106]
Zinc	Luckeneder, 2021[107]
Activities/applications	**Source**
Biofuels (ethanol, solid biomass, etc.)	Multiple sources
Feed for animal protein—cattle, pork, chicken, aquaculture, etc.	Multiple sources
Urban/settlement and infrastructure development	Jayathilake, 2021[108]
Hydroelectric dam development	WWF, Deforestation Fronts, 2021[109]
Oil and gas exploration	Jayathilake, 2021[110]

96 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

97 Yu, L. et al. (2018). Monitoring surface mining belts using multiple remote sensing datasets: A global perspective. Ore Geology Reviews, 101, 675–687.

98 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

99 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

100 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

101 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

102 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

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106 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

107 Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.

108 Jayathilake, H. Manjari, et al. (2021). Drivers of deforestation and degradation for 28 tropical conservation landscapes. Ambio, 50, 215–228.

109 WWF. Pacheco, P. et al. (2021). Deforestation fronts: Drivers and responses in a changing world. WWF, Gland, Switzerland.

110 Jayathilake, H. Manjari, et al. (2021). Drivers of deforestation and degradation for 28 tropical conservation landscapes. Ambio, 50, 215–228.

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- Luckeneder, S. et al. (2021). Surge in global metal mining threatens vulnerable ecosystems. Global Environmental Change, 69, 102303.
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b. First point of aggregation

The data requirements within the No Conversion of Natural Ecosystems target differ based on a company's value chain position(s) and proximity to the site of soft commodity harvest/production or hard commodity extraction (e.g., "the cradle" in life cycle assessment terminology).

While "producers and site owners/operators" are clearly defined, as they own and/or operate the land where production/harvest and extraction occur, companies sourcing from producers and from the "first point of aggregation" are less defined. These actors are key for spatially explicit target setting, as they should theoretically have traceability to the production or extraction site (where targets will be implemented). We understand that not all companies at the first point of aggregation have traceability for all supply chains at this time—the intention is for this to be a stretch goal for companies to implement over time. Increased transparency at the front end of supply chains will benefit companies further down the supply chain (closer to retail, consumers, and asset management) who can assess risk and take actions to align their supply chain with their stated goals.

Table 18 defines SBTN's first point of aggregation for many conversion-driving commodities.

Table 18: SBTN's suggestion for first point of aggregation.

Global conversion-driving commodities	First Point of Aggregation
Cattle	Meat packing and processing facilities, milk and dairy processing facilities
Cocoa	Refineries and grinders
Coffee	Processing (drying to grinding beans)
Maize	Wet and dry milling
Oil palm	Oil palm mill and collection port
Rice	Rice mill (cleaning and husking)
Rubber	Rubber dealer/first processing
Sorghum	Milling
Soybeans	Crushing facilities
Sugarcane	Sugar mills
Timber/wood fiber	Timber mill/pulp production facility
Wheat	Milling facilities
Biofuels (ethanol, solid biomass, etc.)	Depending on feedstock, align with first point of aggregation above by commodity
Feed for animal protein—cattle, pork, chicken, aquaculture, etc.	Feed mixing and pellet processing facility

c. Accounting for land use change

Accounting for land use change at the level of the production unit

Monitoring land use change (LUC) at the level of production units (e.g., farms, plantations, and forest management units) or project sites (e.g., mining sites, construction sites) provides the greatest amount of precision about the impact of company operations and supply chains and is the best way to determine whether products or sites are linked to recent deforestation or conversion. Accounting for LUC at this level requires known and mapped locations of the given production units, demarcated by georeferenced boundaries. The role of any given company in monitoring and accounting for LUC at the site level may differ depending on its position(s) in the supply chain. Upstream supply chain actors (i.e., producers, primary processors, and traders with visibility to the production unit) are in a position to monitor on-the-ground conditions. They should directly monitor and document LUC and furnish downstream buyers with information about LUC associated with the products being sold. Downstream companies that purchase commodities or derived products may assess recent deforestation and conversion at the site level by gathering data collected by their suppliers, monitoring known production sites directly using spatially explicit remote sensing data, or using third-party certification schemes with chain of custody models that provide traceability to origin.

Companies should apply the following steps to account for LUC and associated emissions at the scale of the production unit:

1. Identify the spatial boundaries of production units owned or managed by the company or known to produce materials in a company's supply chain.

2. Identify LUC events that have occurred within the spatial boundary since the cutoff date and during the emissions assessment period. Deforestation and conversion identified since the cutoff date should be reported through appropriate indicators. If there has been no deforestation or conversion on a production unit since the cutoff date, then product volumes from that production unit may be considered deforestation/conversion-free.

ACCOUNTING FOR LAND USE CHANGE AT AN AREA LEVEL

It is sometimes not possible or appropriate to assess conversion of natural ecosystems at the scale of specific production units in a company's supply chain. In these cases, both supply chain deforestation/conversion and scope 3 LUC emissions may be accounted for at the scale of a sourcing area in which production units are located.

Depending on the location, production context, and commodity, a sourcing area may be the supply-shed of a processing facility (such as a radius surrounding a palm oil mill), a production landscape (such as the area encompassing a smallholder cooperative), or a subnational jurisdiction.

Assessments at an area level serve as a proxy for direct LUC, and emissions accounting uses statistical LUC (sLUC) methods. By providing an estimate of LUC potentially allocated to a given product, sLUC inherently also considers some amount of indirect LUC—that is, pressure by expansion of one commodity that may lead to LUC for another commodity (see section 4.5 of AFi's guidance: Deforestation- and conversion-free supply chains and land use change emissions: A guide to aligning corporate targets, accounting, and disclosure).

WHEN LAND USE CHANGE MAY BE ASSESSED AT THE LEVEL OF A SOURCING AREA

Accounting for deforestation and conversion associated with agricultural and forest commodities at the scale of a sourcing area may be appropriate in a range of circumstances, including when:

- Downstream companies do not have physical traceability to the production unit level and may therefore need to monitor LUC at the sourcing area level as the best available option. In this case, the sourcing area should be the smallest geographic area from which commodity volume is known to originate, and companies should also take steps to increase traceability of these volumes.

- A sourcing area is the most relevant scale for managing deforestation and conversion risk, for example where:
  - Upstream companies such as primary processors source commodity volumes from a specified radius or source-shed around their facilities without maintaining long-term buying relationships with specific producers.
  - Companies source from smallholder producers whose materials are aggregated at the level of a co-op or collection point and where further traceability is not possible.
- Companies source from jurisdictions or landscapes where it can be shown that there has been no or negligible recent conversion. In these cases, companies may find it cost-effective to monitor deforestation/conversion at the level of such areas. Doing so requires regular monitoring to assess or confirm the risk status of these jurisdictions and identify any changes in risk status.

METHODS TO ALLOCATE LAND USE CHANGE IN A SOURCING AREA TO COMMODITY VOLUMES (AFI GUIDANCE)

There are many approaches to allocating area-level data on LUC to commodity volumes sourced from that area, and improved data and methodologies are rapidly being developed.

All such methods utilize remote sensing data repeated over the relevant time frames as well as statistics about agricultural production and land use in the area.

Land use change included in the allocation process: It is recommended that, when allocating LUC at an area level to specific commodity volumes, all LUC that may be related to agriculture (for crop or livestock products) or forestry (for forest products) is included in the analysis. Consideration of all agriculture- or forestry-related LUC allows companies and others to best account for varied LUC trajectories or indirect LUC pressures, providing an appropriately conservative approach to allocation.

Time frame of land use change included in the allocation process: When accounting for LUC emissions, the 20-year or longer assessment period should be used to calculate the LUC to be allocated. When accounting for deforestation and conversion, the cutoff date should be used to calculate the LUC to be allocated. When a sectoral or commitment cutoff date does not exist, a fixed reference date should be specified that is not later than 2020 and is recommended to be at least five years prior to the reporting year.

Table 19: Greenhouse Gas Protocol's approaches to allocation of land use change at the level of a sourcing area.

Basis for allocation	Method	Data needs specific to allocation approach	Data needs common to both allocation approaches
Relative land occupation Called "shared responsibility approach" by GHGP	Allocate recent land use change across products based on the relative land area occupied by each product.	Total land area in agriculture and/or forestry in sourcing area. Amount of land area in production for commodity of interest in sourcing area.	Area of LUC in sourcing area • Deforestation/conversion associated with agriculture and/or forestry since cutoff date. • Associated LUC emissions for each year of assessment period. Quantity of commodity of interest produced in the area. Quantity of commodity of interest sourced by the company from the area.
Relative product expansion Called "product expansion approach" by GHGP	Allocate recent land use change across products based on the relative area of expansion for each product.	Total area of expansion of agriculture and/or forestry production since cutoff date and in each year of the assessment period. Expansion of production area of commodity of interest since cutoff date and in each year of the assessment period.	

Allocation approaches

The GHGP provides two recommended approaches for allocating LUC in each area:

1. Allocation based on land occupation.
2. Allocation based on commodity expansion.

Table 19 provides descriptions of these two approaches, and Chapters 7 and 17 of the draft GHGP Land Sector and Removals Guidance provides additional detail on applying allocation methods to LUC emissions.

Other allocation methods may be used if they meet the above criterion of considering all agricultural (or forestry) related LUC in the sourcing area. In particular, when commodities are a relatively small component of land use in an area, other more context-specific approaches may be warranted. Allocation approaches based on product-specific conversion—those which only consider LUC on land currently used for the production of a given commodity—may not effectively account for LUC trajectories in a sourcing area and therefore may not be credible. Such methods may be assessed through the piloting process of the GHGP Land Sector and Removals Guidance, and determination of whether this approach (called "spatially explicit sLUC approaches" by the GHGP) will be acceptable for LUC emissions accounting will be made following that period. In all cases, the method and data sources used to allocate LUC and associated emissions to products within a sourcing area should be clearly disclosed.

Box 12: Comparison of cutoff dates for land use change (LUC) emissions accounting.

LUC emissions accounting and target setting (guided by the GHGP and SBTi FLAG, respectively) requires companies to measure LUC and corresponding emissions based on a retrospective assessment period of 20 years or longer, starting from the reporting year and looking back in time.

If products have a crop cycle or rotation period greater than 20 years, then the assessment period should be at least as long as the crop rotation period. The length of the assessment period reflects the average time that it takes for soil carbon stocks to reach a new equilibrium following land use or conversion, and takes into consideration diverse LUC trajectories.

The GHGP and SBTi FLAG guidance allows for flexibility in the approach used to allocate the total LUC emissions over the assessment period. Specifically, companies may choose to apply either linear discounting or equal discounting over time. See Chapter 7 of the GHGP Land Sector and Removals Guidance for more detail.

The longer time frame included in LUC emissions for GHG accounting is based on how long emissions from ecosystem conversion remain in the global emissions budget. However, this calculation does not provide guidance on when that land conversion should stop, only the length of time that emissions must be reflected in the GHG inventory. The 2020 cutoff for SBTN Land's No Conversion target acts independently of this GHG accounting guidance and provides a cutoff date for conversion of natural ecosystems aligned with the Kunming-Montreal Global Biodiversity Framework.

STEPS FOR ACCOUNTING FOR LAND USE CHANGE AT THE LEVEL OF A SOURCING AREA

Companies should apply the following steps to account for LUC and associated emissions at the level of a sourcing area:

1. Select an appropriate spatial boundary based on physical traceability of the product to a given area, **for example a sourcing region or subnational jurisdiction. The maximum spatial resolution allowable under the SBTN Land targets is the first administrative division below national scale**.

2. Use suitable data products to identify all areas within the spatial boundary where land use has **changed from a forest or other natural ecosystem to cultivated land, agriculture, or plantation forestry since the cutoff date (for deforestation/conversion accounting) and within the assessment period (for LUC emissions accounting)**.

3. Allocate deforestation and conversion **identified since the cutoff date to product volumes, using one of the approaches identified in Table 19 or a similar credible method**.

    - Deforestation/conversion footprint should be reported through appropriate indicators (see sections 1.3 and 1.4), along with information on allocation methods and data sources.
    - If no LUC is identified within a given sourcing area, then volumes sourced from that area may be considered deforestation/conversion-free (see section 4.6 of AFi's guidance: Deforestation- and conversion-free supply chains and land use change emissions: A guide to aligning corporate targets, accounting, and disclosure).

d. How to consult the SBTN Natural Lands Map

HOW TO USE THE MAP TO CALCULATE CONVERSION OF NATURAL ECOSYSTEMS AFTER 2020

This section provides guidance on how a company can consult the SBTN Natural Lands Map to calculate conversion of natural ecosystems based on direct measurements or statistical calculation of conversion. There are different prerequisites and associated pathways for companies at different stages of supply chains.

PRODUCERS AND PROJECT SITE OWNERS AND OPERATORS

Producers and project site owners/operators are required to collect data (as per section ii, "Data requirements to set Land targets") on their production units and recent conversion occurring after the 2020 baseline year.

With the data collected, companies can overlap the spatial data displaying recent conversion with the map. The map will allow a company to identify whether the conversion that occurred is of natural ecosystems or other non-natural land.

The conversion of natural ecosystems that has occurred must be disclosed to SBTN and transparently reported via CDP Forests (as best practice) or following Global Reporting Initiative requirements.

All conversion of natural ecosystems that has happened after 2020 must be remediated based on forthcoming remediation guidance.

SOURCING FROM PRODUCERS OR FROM FIRST POINT OF AGGREGATION

Companies who are sourcing commodities and products driving conversion (Annex 1a) from producers or from the first point of aggregation (Annex 1b) are required to collect data (as per section ii, "Data requirements to set Land targets") on production units or sourcing areas. When accounting directly for conversion through a production unit's spatial data, companies can consult the map following the same procedure used by producers.

Companies using data on sourcing areas must follow the accounting guidance for estimating the area converted using statistical LUC methods.

For a given sourcing area, data on conversion must be retrieved. All conversion attributable to a production unit must be assessed through the SBTN Natural Lands Map to understand the hectares of natural ecosystems converted. Allocation methods presented in the accounting guidance must be used to allocate responsibility of conversion to a given company. Companies that have sourcing information only to subnational jurisdiction will use statistical LUC to estimate conversion.

SOURCING FROM DOWNSTREAM THE FIRST POINT OF AGGREGATION

Companies who are sourcing commodities or products driving conversion downstream from the first point of aggregation are required to collect data (as per section ii, "Data requirements to set Land targets"). For volumes traceable to production units, companies can consult the map using the same procedure defined for producers, site owners and operators. For volumes traceable to sourcing areas, companies can consult the map following the same procedure used by sourcing from producers or the first point of aggregation. For volumes that are not yet traceable and/or highly transformed, companies cannot use the map to assess and quantify conversion of natural ecosystems. In this case, companies are asked to collect data on the volumes purchased of all commodities and products containing them and disclose them following best practices in disclosure (sections 1.3 and 1.4) and to assess conversion using statistical LUC.

Annex 2: Land Footprint Reduction

a. The relative merit of absolute versus intensity approaches and justification for SBTN Land's approach for Version 1.0

This section provides information on the scientific basis of the absolute and intensity Land Footprint Reduction target options and explores the benefits and challenges of each approach.

THE SCIENCE BASED TARGETS INITIATIVE'S (SBTI) APPROACH

SBTi allocates responsibility for climate mitigation based on convergence or contraction approaches (see Figure 9). For the convergence approach, all companies in a given sector reduce their emissions intensity to a common value by a given year as dictated by a global temperature pathway. For example, power sector companies reduce their emissions intensity per kWh produced to the same value. For the contraction approach, all companies reduce their absolute or economic intensity emissions at the same rate, regardless of baseline performance. For example, the power companies may each reduce their emissions intensity by a common percentage but arrive at different absolute values.[111]

ABSOLUTE CONTRACTION APPROACH FOR LAND FOOTPRINT REDUCTION

Applying this concept to Land Footprint Reduction, all companies reduce their agricultural land footprint at the same rate (determined by the global IPCC target for agricultural footprint reduction), regardless of sector baseline performance (see Figure 10).

Companies setting absolute Land Footprint Reduction targets would reduce their absolute land footprint at a linear rate of 0.35% per year, or by 3.5% by 2030, from a 2020 base year, and by 10.6% by 2050 from a 2020 base year. This method is a simple, straightforward approach to set and track progress toward targets that is applicable to the agriculture sector. Table 20 summarizes the inputs and outputs of the method.

111 https://sciencebasedtargets.org/resources/files/foundations-of-SBT-setting.pdf

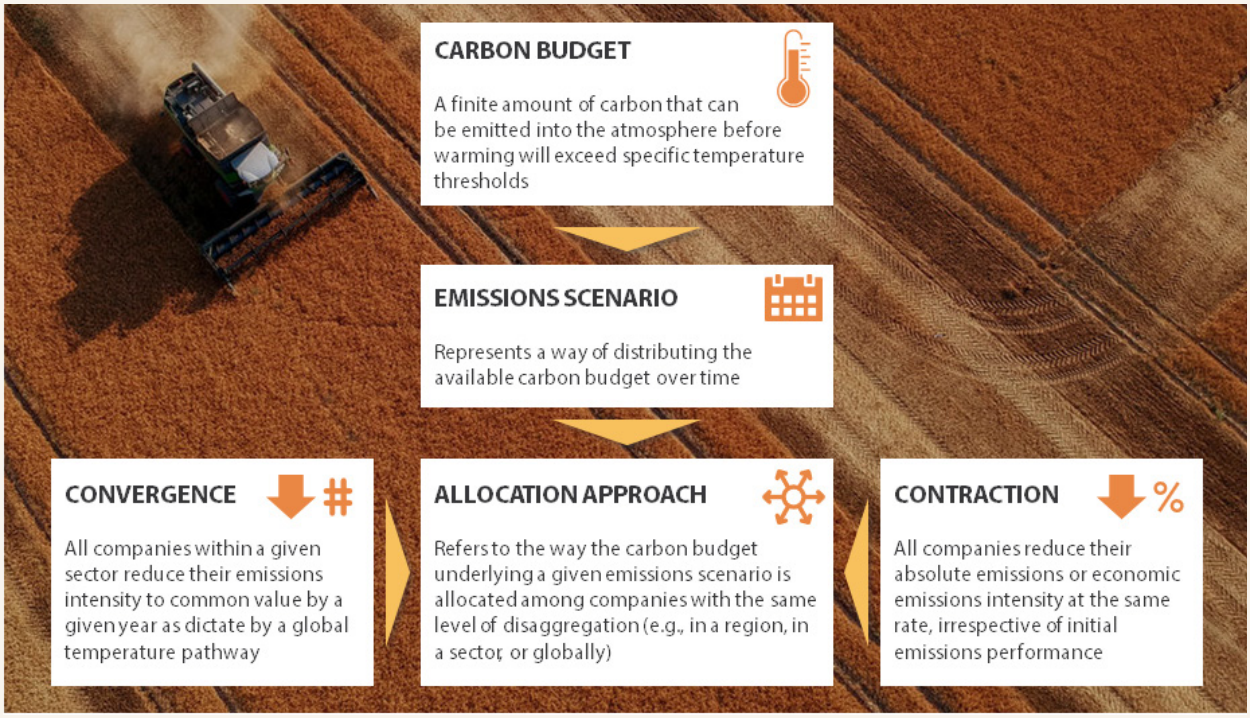

Figure 9: SBTi's allocation approaches (adapted from SBTi). Source for the figure: https://sciencebasedtargets.org/resources/files/foundations-of-SBT-setting.pdf

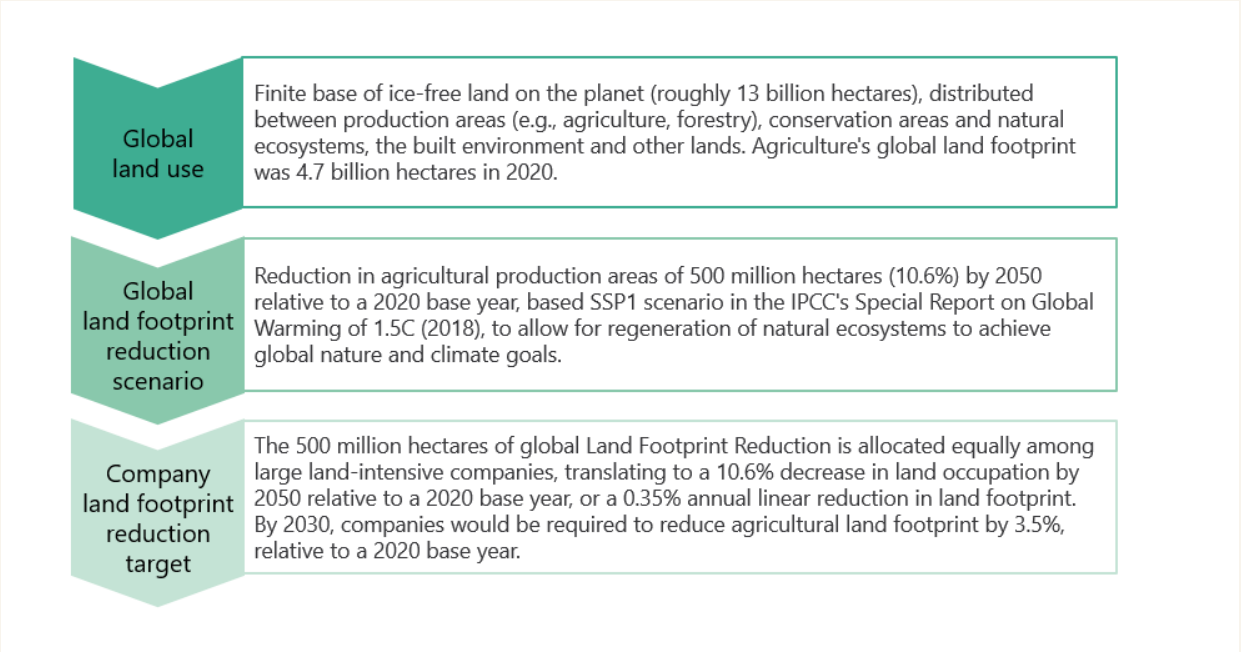

Figure 10: SBTN Method for absolute Land Footprint Reduction.

INTENSITY CONTRACTION APPROACH FOR LAND FOOTPRINT REDUCTION

SBTi also includes an intensity contraction approach where companies in a given sector reduce their emissions intensity by a common percentage by a given year.[112]

With global food demand projected to grow by 45% between 2017 and 2050 (Searchinger et al., 2021), it follows that if productivity in terms of food produced per hectare were also to grow at this rate (a 1.4% annual linear rate), no further agricultural land expansion would be needed to meet projected demand. When these productivity increases are coupled with changes to consumption (e.g., reduced food loss and waste, shifts to healthy and sustainable diets), it would free up an amount of land greater than the 500 Mha goal of global agricultural land footprint reduction in the SSP1 scenario in the IPCC's Special Report on Global Warming of 1.5°C.[113]

In a similar vein, the Food and Land Use Coalition's "Better Futures" scenario (2019) also exceeds this global 500 Mha agricultural land footprint reduction goal, and includes annual linear productivity growth of 1.1%, along with demand-side measures.[114]

112 https://sciencebasedtargets.org/resources/files/foundations-of-SBT-setting.pdf

113 https://www.ipcc.ch/sr15/

114 https://www.foodandlandusecoalition.org/wp-content/uploads/2019/09/FOLU-GrowingBetter-GlobalReport.pdf

Table 20: Characteristics of the absolute reduction approach.

Method	Company Input	Method Output
Absolute Reduction	• Base year. • Target year. • Base year agricultural land occupation ("land footprint" or "terrestrial ecosystem use"), disaggregated by direct operations versus upstream impacts (SBTN Step 1 output).	Overall reduction in the agricultural land footprint of the company by the target year, relative to the base year, using a rate of 0.35% annual linear reduction.

Table 21: Characteristics of the intensity reduction approach.

Method	Company Input	Method Output
Intensity Reduction	• Base year. • Target year. • Base year agricultural land footprint, disaggregated by direct operations versus upstream impacts (Step 1 output). • Activity level in the base year (e.g., amount of agricultural products produced or purchased). • Projected change in activity by target year.	A reduction in the agricultural land footprint of the company by the target year per kg of agricultural products, relative to the base year, using a rate of 1% annual linear reduction, and its translation to absolute change in land footprint.

To be precautionary and ambitious, SBTN Land proposes that the land footprint intensity reduction method is based on the higher productivity growth (1.4% annual linear rate; 45% growth between 2017 and 2050). This level of productivity growth also corresponds to roughly a 1% reduction in land occupation per kg of agricultural products produced per year.[115] Table 21 summarizes the inputs and outputs of this intensity reduction (contraction) method.[116]

For this version of Land targets, SBTN has chosen weight (tons or kilograms) of agricultural products produced as the denominator (i.e., how the "unit" of food or agricultural product is expressed) for intensity targets. However, there are other potential denominators that could be considered for future target-setting methods, drawn from food and agriculture life cycle assessment studies. The benefits and challenges of different denominator options are articulated in Table 22. SBTN recognizes that a nutritional quality denominator would be preferable to the weight of agricultural products produced; however, there is no universally accepted metric that captures overall nutritional quality.[117] This is an area for further research.

PROS AND CONS OF ABSOLUTE VERSUS INTENSITY LAND FOOTPRINT REDUCTION TARGETS

Absolute and intensity targets each have advantages and disadvantages, which are shown in Table 23. For both sets of targets, there is a risk that they incentivize unsustainable agricultural intensification or incentivize consumer companies to shift away from lower-yielding smallholder farmers if not appropriately balanced with social and environmental safeguards (see Annex 2b below).

Given the benefits and challenges with both approaches, for this version of Land targets, SBTN has left open the option for companies to set either type of target. In general, absolute targets are recommended for large consumer companies such as retailers given that they have greater ability to reduce land footprint through demand-side measures such as shifting their portfolios to less-land-intensive products.

115 This is because a 45% growth in productivity per hectare corresponds to a 31% reduction in land occupation per unit of food (1/1.45=0.69), which over a period of 33 years is roughly a 1% reduction in land occupation per unit of food per year.

116 Because yields of different foods vary so widely (both between food types and across countries and regions), a "convergence" land occupation intensity reduction approach would be very complex to design.

117 McLaren, S., Berardy, A., Henderson, A., Holden, N., Huppertz, T., Jolliet, O., De Camillis, C., Renouf, M., Rugani, B., Saarinen, M., van der Pols, J., Vázquez-Rowe, I., Antón Vallejo, A., Bianchi, M., Chaudhary, A., Chen, C., CooremanAlgoed, M., Dong, H., Grant, T., Green, A., Hallström, E., Hoang, H., Leip, A., Lynch, J., McAuliffe, G., Ridoutt, B., Saget, S., Scherer, L., Tuomisto, H., Tyedmers, P. & van Zanten, H. 2021. Integration of environment and nutrition in life cycle assessment of food items: opportunities and challenges. Rome, FAO.

Table 22: Considerations for choosing denominator for intensity target.

Denominator	Benefits	Challenges
Weight (e.g., kg or t)	Relatively easy to measure and communicate.	Does not capture food functionality or nutrition; incentivizes commodities high in water content, including land-intensive ones (e.g., milk).
Spend or sales (e.g., US$)	Most businesses already measure this, easy to communicate.	Commodity prices fluctuate, which can hide true trends in land footprint intensity; it is therefore less accurate as a land footprint indicator.
Kilocalories	Moderately easy to measure with conversion ratios from weight; covers all foods.	Does not describe nutrition more broadly than energy content; incentivizes energy-dense commodities, including nutrient-poor ones (e.g., sugar, vegetable oils).
Protein	Moderately easy to measure with conversion ratios from weight; covers all land-intensive foods.	Does not describe nutrition more broadly than protein content; is not meaningful for protein-poor foods and can disincentivize some healthy ones (e.g., vegetables).
Combined nutrient quality metric or index	Potentially most meaningful in terms of balancing resource use with health and nutrition.	Most complex to measure and communicate; lack of consensus about which metric or index is most appropriate to use.

Table 23: Considerations regarding absolute vs. intensity targets for Land Footprint Reduction.

Aspect	Absolute target	Intensity target
Simplicity	Simpler to calculate and communicate.	Can be more complex to calculate and communicate. If targets are differentiated by geography or commodity in future versions, it would increase complexity, but could also introduce clarity about where there are yield gaps and sustainable intensification opportunities.
Link to global 500 Mha land footprint reduction goal	Clear link; company can say it is reducing land pressures in line with global goal.	Needs additional step to convert into absolute target and link to global goal.
Leakage risks	A company could hit an absolute target by reducing agricultural production; if not made up in efficiency elsewhere then other actors' agricultural land footprints could expand.	A company could hit an intensity target even while its absolute land footprint continues to increase.
Equity	Bias toward large producers and purchasers; unfair for small landowners; unfair for small companies producing less-land-intensive products (similar to SBTi for absolute GHG emissions).	Can accommodate both large and small producers and purchasers; could be more appropriate for companies based in Global South.
Link to business growth projections	No link; no guarantee that the company will be "doing its fair share" of contribution to global productivity growth; targets can be met for wrong reason (business failure).	Company "does its fair share" of contribution to global productivity growth, regardless of its size and projected business growth.
Risk of unintended consequences for nature (note: risk mitigated in Version 1.0 through the No Conversion of Natural Ecosystems and Landscape Engagement targets)	Could incentivize unsustainable agricultural intensification; safeguards needed (company must also set SBTi FLAG climate and SBTN water targets; future SBTN Land targets could include soil health); could disincentivize forms of agriculture that are lower yielding but have lower local environmental impacts.	Could incentivize unsustainable agricultural intensification; safeguards needed (company must also set SBTi FLAG climate and SBTN water targets; future SBTN Land targets could include soil health); could disincentivize forms of agriculture that are lower yielding but have lower local environmental impacts.

b. Managing trade-offs and unintended consequences through response option planning and social safeguards

Global models indicate that agricultural land footprint reduction of the scale required is possible through a combination of sustainable crop and livestock productivity gains where there are yield gaps, reduced food loss and waste across value chains, more circular use of natural resources, and—in high-income countries—shifts toward healthier, more sustainable, and less-land-intensive diets.

Critically, all these levers are needed to avoid unintended consequences and to manage potential trade-offs between nature, climate, and Sustainable Development Goals. There is the risk that efforts to take agricultural land out of production could put local (or even global) food security at risk if not balanced with productivity gains and demand-side measures such as dietary shifts and reducing food loss and waste across value chains.

Land footprint reduction could also lead to unsustainable forms of agricultural intensification (such as overuse of fertilizers and chemical inputs) that degrade soil and water resources, emit GHGs unnecessarily, and undermine long-term productivity and resilience (though these would inhibit company progress on their science-based targets).[118] On the other hand, shifting from higher-yielding to lower-yielding agricultural systems to reduce local environmental impacts could increase land use demands and pressures on natural ecosystems elsewhere—negatively impacting the biodiversity and carbon stocks of those off-farm ecosystems (Box 13). That said, there is evidence that both "technological" and "agroecological" approaches can increase agricultural productivity while reducing environmental impacts and building resilience, and companies should consider the range of options they have to sustainably boost productivity of the commodities they produce or source.[119, 120]

118 Masson-Delmotte, V., Pörtner, H. O., Skea, J., Buendía, E. C., Zhai, P., & Roberts, D. (2019). Climate change and land. IPCC Report.

119 Phalan, B. T. (2018). What have we learned from the land sparing-sharing model?. Sustainability, 10(6), 1760.

120 Newman-Beckett, E. (2023). Aligning regenerative agricultural practices with outcomes to deliver for people, nature and climate.

There are also potential unintended social and/or ethical consequences, for example if companies purchasing agricultural products switch their purchasing from lower-yielding farmers—including smallholders who may be highly dependent on revenue from a single company to support their livelihoods—toward higher-yielding farmers. Intensification of animal agriculture systems can also lead to worsening of animal health and welfare, high antibiotic use, and increased risk of zoonotic disease.[121] Similarly, certain agricultural systems such as extensive ruminant livestock systems in arid lands are not well suited to land footprint reduction measures given their importance for food security and local livelihoods.

Given the potential for unintended consequences, SBTN provides additional guidance on the types of response options that companies *can* focus on in their delivery of the Land Footprint Reduction target; it also highlights some social and environmental safeguards that *should* be considered in their implementation.

121 Hayek, M. N. (2022). The infectious disease trap of animal agriculture. Science Advances, 8(44), eadd6681.

Box 13: Land sparing and land sharing.

The Land Footprint Reduction target seeks to help companies sustainably boost productivity on working lands, so as to reduce the global agricultural land footprint and allow some areas to be restored into natural ecosystems. As it encourages increased efficiency of land use, it is associated with a "land sparing" approach.

An alternative or complementary perspective, "land sharing" seeks to maximize biodiversity, natural processes, and carbon stocks on farms and other working lands (Phalan, 2018).[122] In some scenarios, ambitious changes to food consumption patterns (e.g., reduced food waste, dietary changes), pursued with "land sharing" measures, can lead to a reduction in agricultural land use.

A balance between the two perspectives is necessary. On the one hand, high-yield farming can be unsustainable and degrade soil and water resources, undermining long-term productivity and resilience (IPCC, 2019)[123]. On the other hand, if boosting on-farm biodiversity and carbon stocks lowers agricultural productivity, overall land requirements for food production can increase, increasing pressure to convert natural ecosystems elsewhere. This latter point is likely why the Global Biodiversity Framework acknowledges the need for sustainable forms of agricultural intensification.

While setting a Land Footprint Reduction target acknowledges the need to spare land for nature while meeting humanity's need for food, the three SBTN Land targets work together to help companies find the appropriate balance of "land sparing" and "land sharing" approaches—along with changes to food consumption patterns—that collectively avoid further ecosystem conversion, reduce agricultural land use while feeding more people, and improve ecological integrity on working lands and across broader landscapes.

122 Phalan, B. T. (2018). What have we learned from the land sparing-sharing model?. Sustainability, 10(6), 1760.

123 Masson-Delmotte, V., Pörtner, H. O., Skea, J., Buendía, E. C., Zhai, P., & Roberts, D. (2019). Climate change and land. IPCC Report.

RESPONSE OPTIONS FOR MANAGING TRADE-OFFS AND UNINTENDED CONSEQUENCES

There is no one correct approach to agricultural production across the nearly 5 billion hectares of global agricultural land: companies should plan response options thoughtfully. Sustainable agricultural intensification—in a changing climate—involves a combination of efficiencies in agricultural inputs, including not only land but also freshwater and nutrients. Changes to production practices often involve changes to costs, profitability, and/or labor requirements.

Setting multiple SBTN targets (e.g., land, water, climate) for nature should also help companies think through potential trade-offs across response options, and how such trade-offs can be managed.

The SBTN Landscape Engagement target (Target 3) also works to ensure that companies avoid unsustainable forms of agricultural intensification and instead improve the ecological integrity of working lands and surrounding landscapes.

A table of potential response options is provided in Table 24 below (as well as a more comprehensive mapping across the three Land targets in Annex 3), but they are summarized at a high level here:

- **Increasing yields and production efficiency.** Crop and livestock yields vary widely across the globe. Increasing yields and achieving higher crop and livestock productivity—especially where yields are low and yield gaps are high—is necessary to reduce agriculture's land footprint even as global food demand continues to grow, and even as the climate changes. Indeed, increased agricultural productivity is a common assumption across all of the scenarios of reduced agricultural land occupation listed in the modeling studies in Table 1 of the supplementary materials provided for this target. However, these productivity gains need to occur with a broader view toward optimizing use of inputs, managing runoff, safeguarding freshwater and soil resources, improving animal health and welfare, and building resilience. If increased yields are achieved by overuse of fertilizer and agricultural chemicals, or by large-scale irrigation expansion, GHG emissions and water scarcity and/or pollution are likely to increase. Improved soil and water management practices such as agroforestry, especially in low-yielding areas, can increase yields while reducing reliance on chemical inputs. In addition, pairing agricultural improvements with ecosystem protection and/or restoration in the same landscape (via combination with the No Conversion of Natural Ecosystems and Landscape Engagement targets) will be essential to counteract the "rebound effect" that can occur when increased productivity leads to higher profitability and pressure to clear more land.[124, 125]

  This category of response options is clearly well aligned with the Global Biodiversity Target 10: "Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services."[126]

- **Reducing loss and waste.** Approximately one third of global food production is lost or wasted between the farm and the plate, with the latest estimates being about 13% of food production lost between the farm gate and the processing stage of the supply chain[127] and 17% of food at the retail level is wasted in households, retail, and food service.[128] Rates of loss and waste vary by commodity, region, and supply chain position, with losses "near the farm" generally being higher in lower-income countries, and waste "near the fork" generally being higher in higher-income countries. Reduction of food loss and waste is a popular and necessary response to reduce land requirements of agricultural supply chains.

124 Leclère, D. et al. (2020). Bending the curve of terrestrial biodiversity needs an integrated strategy. Nature, 585, 551–556, https://doi.org/10.1038/s41586-020-2705-y.

125 Phalan, B. T. (2018). What have we learned from the land sparing-sharing model? Sustainability, 10(6), 1760, https://doi.org/10.3390/su10061760.

126 https://www.cbd.int/gbf/targets/

127 FAOSTAT. (2023).

128 United Nations Environment Programme (2021). Food Waste Index Report 2021. Nairobi.

- **Producing or sourcing foods that are less land intensive.** More than three quarters of agricultural land globally is used to produce meat, dairy, and other animal-based foods, including both pastureland for grazing and cropland for animal feeds. While the majority of global pasture lands cannot grow crops or trees, and while grazing lands can be an important buffer to natural habitats, nearly a billion hectares of pastureland was formerly forest[129] and cattle pastures represent a leading driver of recent tropical deforestation.[130] In higher-income countries, shifting meat-rich diets toward plant-rich diets can be an effective path to reducing agricultural land footprint. Companies should take a holistic approach when considering these options based on the commodities and places where they operate or source. In addition, if a company sourcing meat or dairy shifts its sourcing to more extensive livestock production systems—for animal welfare or other reasons—they would need to balance this with a reduction in the amount sourced to avoid increasing the associated land footprint.
- **Establishing riparian buffer zones, scaling up agroforestry/silvopasture, and restoring lands into natural ecosystems.** Taking lands out of direct production and increasing on-farm, set-aside areas can contribute to climate mitigation, water filtration, and soil stabilization on working lands. That said, if yields fall, this response option can lead to leakage of agricultural land occupation elsewhere (and, potentially, other companies' land occupation increasing) given the ongoing growth in global food demand.

129 Searchinger, T. D., Wirsenius, S., Beringer, T., & Dumas, P. (2018). Assessing the efficiency of changes in land use for mitigating climate change. Nature, 564(7735), 249-253.

130 Goldman, E., Weisse, M., Harris, N., & Schneider, M. (2020). Estimating the role of seven commodities in agriculture-linked deforestation: Oil palm, soy, cattle, wood fiber, cocoa, coffee, and rubber. Technical Note, World Resources Institute.

Table 24: Response options incentivized by Land Footprint Reduction targets.

Response option category	Comment
Avoiding deforestation and conversion of natural habitat and ecosystems	At the global scale, deforestation and conversion of natural habitat and ecosystems cannot be avoided until the area under productive use (e.g., agriculture, forestry, infrastructure, mining) ceases to expand.
Certifying deforestation- and conversion-free sector, supply chains, places, and commodities	Without freezing and reducing agriculture's land footprint, the likelihood of leakage (of deforestation and conversion occurring elsewhere) remains high, even when companies have obtained certifications for their own value chains.
Providing financial, material, or in-kind support to landscape restoration	At the global scale, landscape restoration cannot happen at scale until the area under productive use is reduced.
Improving land management and other practices	Many practices to increase land use efficiency can be net land management improvements, although productivity and efficiency must be enhanced in ways that safeguard soil, water resources, local and global biodiversity, and natural ecosystems—and in ways that increase rather than undermine resilience.
Increasing material or procedural efficiencies in sourcing and supply chains	Reducing losses and waste across supply chains, improving efficiency of wood harvests and use, and sourcing products that are less-land-intensive (e.g., plant-based foods), can reduce the amount of land needed to meet human demands for land-based products.
Increasing participation in jurisdictional land use planning	Linking efforts to use working lands more productively and efficiently with efforts to protect and restore nearby lands in landscapes can be a powerful way to incentivize progress against both a No Conversion of Natural Ecosystems target and a Land Footprint Reduction target (for example, public support for agricultural improvement can increase political support for ecosystem protection in high-priority jurisdictions).

Table 25: Potential trade-offs with other response options.

Response option category	Comment
Improving land management and other practices	If done poorly, efforts to increase land use efficiency can create trade-offs with other aspects of land management and environmental protection. For example, overuse of fertilizer leads to water and air pollution and excessive GHG emissions. Large-scale irrigation expansion can deplete scarce freshwater resources and damage aquatic ecosystems. In addition, productivity gains can make farming and forestry more economical and spur new land-clearing. Mitigation strategy: Setting not only Land Footprint Reduction targets, but also other Land targets (No Conversion of Natural Ecosystems, Landscape Engagement), as well as climate and water targets, can help companies strike the correct balance. SBTN's Version 1.0 of Land targets will also help ensure that productivity gains that reduce the intensity of agriculture's land footprint do not undermine other land management goals.
Response options linked to SBTN Freshwater methods	See above.
Mitigating sources of environmental pollution	See above.

Depending on how the response options to reduce a company's agricultural land footprint (and/or land footprint intensity) are implemented, there are potential trade-offs with other response options that must be managed and avoided wherever possible. Setting the full range of SBTN targets for land and water, in addition to climate targets through SBTi FLAG, will help companies strike the correct balance. SBTN Land recognizes that a location in which a company takes efforts to reduce agricultural footprint may not yet be a priority location for freshwater science-based targets and/or landscape engagement targets – as such, it is important to ensure that trade-offs are managed in specific locations.

SAFEGUARDS FOR MANAGING TRADE-OFFS AND UNINTENDED CONSEQUENCES

The following social and environmental safeguards *should* be considered in companies' implementation of Land Footprint Reduction targets:

1. Purchasing companies *should* seek to work with their current suppliers to improve performance over time, rather than just shifting to more-efficient (higher-yielding) suppliers. A strategy of shifting to higher-yielding suppliers carries social risks (potentially harming livelihoods of current suppliers), and/or potentially will not affect global agricultural land demand if other buyers just switch to purchasing from the company's current suppliers.
2. Companies *should* make all efforts to reduce land footprint while ensuring free, prior, and informed consent (FPIC) and respecting the land and human rights of local communities.
3. Companies *should* assess the potential adverse impacts of conversion on the human and land rights of affected stakeholders when implementing response options for land footprint reduction and follow SBTN guidance on stakeholder

engagement. Additional guidance is available through the United Nations General comment No. 26 (2022) on Land and Economic, Social and Cultural Rights and the United Nations Guiding Principles on Business and Human Rights.

With regard to reporting on safeguards, SBTN Land requires that companies submitting Land Footprint Reduction targets for validation provide the following information:

1. A narrative description of their strategy and potential response options for achieving their Land Footprint Reduction target, including the proposed approach to addressing potential risks associated with unsustainable intensification (e.g., focusing on areas with opportunities to sustainably improve agricultural productivity, reducing food loss and waste, shifting toward less-land-intensive agricultural products) and unintended social consequences (e.g., prioritizing work with existing suppliers—including smallholders—to improve yields and productivity rather than shifting away to higher-yielding suppliers).

2. Companies submitting both Land Footprint Reduction targets and Landscape Engagement targets are required to submit information to the SBTN Target Validation Team that specifies whether and how locations and/or commodities prioritized for Land Footprint Reduction overlap with landscapes selected for the Landscape Engagement target. As noted above, given the fact that companies will not always have ownership rights over any land freed up through the Land Footprint Reduction target, SBTN has not established requirements for companies to restore that land. Instead, the mechanism for driving restoration is through the Landscape Engagement target.

Annex 3: Landscape engagement roadmap

Table 26: Describes the information and guidance for companies to generate a landscape engagement roadmap.

Information	Scenario	Details	Desired outcome
Actions and timelines (across key criteria)	1, 2	Documentation with list and description of actions and/or investments the company has made and is making, together with: • Expected outcome for each action/ investment. • Timeline to measure progress.	Collective action plan showing how the company intends to improve ecological and social conditions in the landscape.
	3	Documentation with list and description of actions and/or investments the company has made and is making, together with: • Expected outcome for each action/ investment. • Timeline to measure progress.	Documentation showing how the company is planning to establish the initiative, create the structure, and improve to meet the key criteria.
Funding for actions (across key criteria)	1, 2	Explanation and quantification of investments and funding supporting the implementation of any investments the company is making in improving the landscape initiative overall.	Financial plan for the landscape.
	3	Explanation and quantification of investments and funding supporting the implementation of any investments the company is making in improving the landscape initiative overall.	Financial plan for the landscape, within 6 to 12 months.
Landscape selection (Key criteria 1)	1, 2	Clear description of how material landscapes have been selected, based on Approach 1 or Approach 2 from the Land guidance.	Company engages in a landscape or jurisdiction where it is well placed to have positive impacts.
	3	Clear description of how the company has selected the location where the initiative will be established.	Company selects a landscape or jurisdiction where it is well placed to have positive impacts.
Landscape selection—additional (Key criteria 1)	1, 2, 3	Additional description of selection of landscapes based on: • Current or future sourcing risks. • Priority issues or regions for the company's broader strategy. • Existence of other collective action initiatives. • The company's potential to drive positive outcomes beyond its supply chain. • Regulatory environment.	Company engages in a landscape or jurisdiction where it is well placed to have positive impacts.
Stakeholder engagement (Key criteria 2)	1, 2	Documentation showing: • Evidence that an adequate assessment of needs of local communities has taken place with stakeholder consultation. • Stakeholder map, with key stakeholders. • Documentation of formal support of stakeholders for the company's involvement in the landscape collective action plan.	Key stakeholders in the jurisdiction, including local government and producing enterprises, are actively engaged and committed to any action plans and their stated outcomes.
	3	Documentation showing: • Plan for assessment of needs of local communities. • Plan for stakeholder mapping.	Plan on how the company intends to engage key stakeholders in the landscape/jurisdiction.
Stakeholder engagement (Key criteria 2)	1, 2, 3	Evidence that corporate actions are aligned with community needs and objectives.	

Information	Scenario	Details	Desired outcome
Governance (Key criteria 2)	1	Documentation showing: • Formal collaboration agreements (e.g., memorandums of understanding). • Governance structure	Clear and transparent operating procedures define the legal standing of the initiative and the governance roles, responsibilities, and decision-making for different stakeholders in that initiative.
	2	Documentation showing how the company plans to support the governance structure to meet the key criteria: • Formal collaboration agreements (e.g., memorandums of understanding). • Governance structure.	Clear and transparent operating procedures define the legal standing of the initiative and the governance roles, responsibilities, and decision-making for different stakeholders in that initiative.
	3	Documentation showing how the company plans to create the governance structure to meet the key criteria: • Formal collaboration agreements (e.g., memorandums of understanding). • Governance structure.	Clear and transparent operating procedures define the legal standing of the initiative and the governance roles, responsibilities, and decision-making for different stakeholders in that initiative.
Governance (Key criteria 2)	1, 2, 3	• Terms of reference and membership of governance bodies. • Operating procedures/codes of conduct. • Dispute resolution and grievance processes.	
Goals and linkages (Key criteria 3)	1, 2, 3	• Documentation showing details of the theory of change, with intended outputs of the actions and steps by which those outputs will lead to positive landscape outcomes. • A context assessment that determines: • 1. Who is doing what. • 2. Critical risks and their root causes. • 3. Levers of change. • 4. Priority actions.	Company communicates how it is supporting the achievement of landscape objectives and how it monitors its investments and impacts.
Unintended consequences and safeguards (Key criteria 3)	1, 2	• Assessment of unintended negative consequences of proposed actions. • Implementation plan for environmental and social safeguards.	An effective landscape initiative should act on multiple objectives, addressing sustainable production, human wellbeing, and landscape conservation.
	3	• Assessment of unintended negative consequences of proposed actions. • Implementation plan for environmental and social safeguards.	An effective landscape initiative should act on multiple objectives, addressing sustainable production, human wellbeing, and landscape conservation.

Information	Scenario	Details	Desired outcome
Metrics and indicators (Key criteria 3)	1, 2	• Selection of a set of metrics that are suitable to measure both progress and impact of planned actions, and improvement in ecological and social conditions at landscape scale. • Calculation of the baseline corresponding to each indicator. • The list of metrics can be selected from the proposed list of metrics in the guidance (ecological and social conditions), Table 15, or from other sources. • Justification for the use of each metric has to be provided.	A framework is in place to monitor performance improvements in the landscape, in conjunction with the capacity to manage and analyze the data and accurately communicate the results.
	3	• Selection of a set of metrics that are suitable to measure both progress and impact of planned actions at the landscape level. • Calculation of the baseline corresponding to each indicator. • The list of metrics can be selected from the proposed list of metrics in the guidance (ecological and social conditions), Table 15, or from other sources. • Justification for the use of each metric has to be provided.	A framework is in place to monitor performance improvements in the landscape, in conjunction with the capacity to manage and analyze the data and accurately communicate the results.
Data sources (Key criteria 3)	1, 2	Developing a list of data sources used to derive the baseline values of each of the selected metric and indicator. This can include primary and secondary sources.	
	3	Developing a list of data sources used to derive the baseline values of each of the selected metric and indicator. This can include primary and secondary sources.	
Transparency (Key criteria 4)	1, 2, 3	Information on the structure, agreements, financing, and actions of the initiative are publicly and easily accessible.	
Data management system (Key criteria 4)	1, 2	Documentation showing how the company, in the landscape initiative, has in place data governance systems and protocols to credibly gather, store, analyze, and use the data collected in the landscape initiative.	
	3	Documentation showing how the company is creating data governance systems and protocols to credibly gather, store, analyze, and use the data collected in the landscape initiative.	
Reporting progress (Criteria 4)	1, 2	Clear reporting framework and strategy for communicating accessible information about results, partners, and future actions on a regular and recurring basis.	
	3	Clear reporting framework and strategy for communicating accessible information about results, partners, and future actions on a regular and recurring basis.	

IMPLEMENTATION AND VALIDATION GUIDANCE

Companies must prepare the Landscape Initiative Roadmap as a formal document to facilitate implementation and in the future enable audits. Therefore, it should be presented as such during validation.

SBTN validators will check the completeness for all items.

At this stage validators will not be able to provide a standardized judgment on the integrity or quality of the information submitted by the company. However, validators may require additional information or clarification for the purpose of validation for the pilot. This will help the SBTN Land Hub develop more precise evaluation criteria in future iterations of the SBTN Land method.

Annex 4: Mapping of incentivized response options

In addition to the target-setting process, this guidance will also explore some examples of corporate response options. This is a preliminary effort that anticipates more comprehensive "Step 4: Act" guidance. In this context, response options describe the actions that a company could take to improve the state of nature on land that would likely be reflected in the indicator used to measure progress on its targets.

This section provides a suite of response options that shows actions that companies can implement to make progress toward Land targets. Consulting the table below, companies can explore the response options that may have positive contributions toward multiple targets. This framing can be useful to inform target implementation strategies for the achievement of Land and Freshwater targets under SBTN and emissions reductions under SBTi FLAG.

These response options are derived from an original list including publications, projects, and initiatives such as:

- IPBES Global Outlook
- IPCC Special Report on Climate Change and Land
- Forest Landscape Restoration assessments using the Restoration Opportunities Assessment Methodology
- The Fashion PACT
- Nature-Based Solutions Benefits Explorer
- World Business Council for Sustainable Development (Forest Production, Processing & Manufacturing, Downstream)
- SBTN Water Hub
- FLAG SBTi.

The response options have been categorized into a Land response typology of corporate response options and finer resolution options. These include land specific interventions and example actions for companies to take. Table 26 contains consolidated response options classified to SBTN's AR3T Framework.

The Land response options have been assigned direct, indirect, or unknown designations for science-based targets that span the Land targets (No Conversion of Natural Ecosystems, Land Footprint Reduction, and Landscape Engagement), SBTi FLAG, and the SBTN Freshwater targets.

Information from SBTi FLAG guidance was used in assigning these benefits. Synergies across the different targets resulting from individual response options can support robust company strategies with multiple benefits. This analysis demonstrates the potential trade-offs for the nature of certain actions. With this matrix of response options, companies will be able to better evaluate decisions for nature and their business.

These interventions provide a foundation for companies to prioritize actions and places to make a difference for nature on the ground. These projects should include comprehensive actions to meet established targets. The Land Hub seeks to expand on this response option matrix based on future targets and to measure progress on them in Version 2.0 of SBTN's Land target-setting guidance.

Below is a non-exhaustive list of possible response options companies may consider in their efforts to meet the Land science-based targets they have set. Many response options have benefits across land, freshwater, and climate targets. These actions are organized according to the AR3T framework and should be implemented in that order to achieve progress on company targets in the most efficient way according to what nature needs.

These response options should be put together and packaged into an action plan that directly addresses impacts on nature and how best to reach company-specific targets. This list will be expanded over time to align with the latest targets, science, tools, and data.

Table 27: Mapping of incentivized response options.

Direct Indirect Unknown

Target benefits							
No Conversion of Natural Ecosystems	**Land Footprint Reduction**	**Landscape Engagement**	**Freshwater Quantity**	**Freshwater Quality**	**SBTi Climate FLAG**	**Response Option**	**AR3T classification** Avoid, Reduce, Regenerate, Restore, Transform
						Avoid pollution, effluents, and runoff, including acidification.	Avoid
						Avoid illegal logging through monitoring/patrolling and regulating forest use of all timber and non-timber products.	Avoid
						Manage invasive alien species/species encroachment through practice and multiple policy instruments (e.g., monitor silvicultural interventions, remove aggressive indigenous species, remove invasives).	Avoid
						Achieve zero conversion of natural lands in direct operations and supply chains.	Avoid
						Protect critical natural habitat and areas of high conservation value.	Avoid
						Commodity production is not implemented on newly converted natural ecosystems or core natural lands (especially avoid conversion-driving commodities in Annex 1a).	Avoid
						New operations, landfills, or recycling facilities are not implemented in or adjacent to newly converted natural ecosystems or core natural lands.	Avoid
						Avoid persistent organic pollutants and chemicals with demonstrated negative impacts on biodiversity, including harmful chemicals and hazardous substances.	Avoid
						Support reduced impact logging with different techniques.	Reduce
						Reduce impact through conservation-agriculture practices.	Reduce
						Increase food productivity and close the gap between actual and potential yield (e.g., shade-cover system, forage improvement, improve technology and tools).	Reduce
						Use land, fertilizers, and pesticides more efficiently in agriculture (e.g., minimize use of chemical-based pesticides and fertilizers).	Reduce
						Reduce agricultural land footprint in direct operations and supply chains.	Reduce
						Improve sustainable forest management (e.g., enrichment planting, acahuales, diversified vertical forest structure and age composition, seasonal planning, continuous cover forestry, high-stumps, retention trees, maintenance of decaying wood, silviculture, social forestry, sustainable woodlands, mature forest, natural forest, secondary forest, improved woodlots).	Reduce
						Improve cropland management (e.g., brush control, crop residue management, contouring, cover crops, ground cover management, improved fallow, re-vegetation).	Reduce
						Improve grazing land management (e.g., tree range plantings, prescribed grazing).	Reduce
						Improve livestock management (e.g., agropastoral, agro-silvopastoral, silvopasture, natural pasture, perennial pastures and grains, silvopasture intensification, alternative feed).	Reduce
						Reduce disturbances (e.g., light, noise, vibration) from operations on surrounding environment (e.g., installation of silencers).	Reduce

Direct Indirect Unknown

Target benefits							
No Conversion of Natural Ecosystems	**Land Footprint Reduction**	**Landscape Engagement**	**Freshwater Quantity**	**Freshwater Quality**	**SBTi Climate FLAG**	**Response Option**	**AR3T classification** Avoid, Reduce, Regenerate, Restore, Transform
						Monitor risks in regions of resource extraction and minimize resource exploitation of over-extracted, threatened, or CITES listed species.	Reduce
						Reduce off-site impacts of food and nonfood production (e.g., consolidate shipments and suppliers, ensure proper waste disposal, safe disposal of hazardous waste, food storage transformation).	Reduce
						Improve distribution and transport (e.g., localizing food systems, optimizing road network to avoid pressures on core natural lands).	Reduce
						Reduce food waste (post-harvest, along production and supply chains, customer, and retailer levels).	Reduce
						Implement water-efficient agricultural practices (e.g., minimize use of water-intensive species in water-stressed areas, reduce water use in nurseries, upgrade irrigation system, rainwater harvesting, contour farming, terracing, managed drainage, protect groundwater and surface water, reestablish hydrologic connection).	Reduce
						Implement fire management practices (e.g., prescribed burns).	Reduce
						Reduce soil erosion through sustainable practices (e.g., plant vegetation buffers, conservation tillage, no-till, strip tillage, progressive or radical terraces).	Reduce
						Implement agroforestry (e.g., rainfed, cereal-dominated, hinterland, shade-grown coffee, flood plain, improved Milpa, irrigation, perennial crops with trees, Quesungual system, staple grains alley farming).	Reduce
						Prevent/reduce soil compaction and/or salinization.	Reduce
						Avoid establishing new water-intensive operations in water-stressed areas. Protect, create, restore, and reduce conversion of watersheds and coastal wetlands for habitat conservation, clean water supply, and stormwater control (e.g., coastal green belt).	Avoid & Restore
						Avoid conversion and implement restoration of peatlands.	Avoid & Restore
						Promote, implement, and improve agricultural certification schemes including organic agriculture (e.g., RTRS, RSPO, organic cotton standards).	Reduce & Transform
						Promote and improve forest certification schemes (e.g., FSC, deforestation and conversion free; sector, supply chains, places, and commodities).	Reduce & Transform
						Encourage and invest in a circular economy (e.g., paper sludge for bioenergy and fertilizer producers, paper fibers and fillers for the brick industry).	Reduce & Transform
						Increase soil organic carbon content (e.g., organic matter input through harvesting residues, biochar).	Regenerate
						Expand and enhance sustainable intensification on agricultural lands (e.g., mixed crop-livestock production models).	Regenerate
						Improve soil health (e.g., stabilize substrates, soil conservation, rice straw management, fertility management, mulching).	Regenerate

Direct Indirect Unknown

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						Regenerate existing plantations with sustainable practices (e.g., annual crops, agroforests, commercial trees, bamboo, enrichment strips, open field, renewal coffee, perennial crops and trees, extended rotation system, and timber outside of livestock areas).	Regenerate
						Improve ecological productivity in working lands in line with landscape-scale objectives and stakeholder needs (e.g., ecological agriculture, silvopasture, agroforestry, border plantings, ecological corridors).	Regenerate
						Switch emphasis of food production toward enhancing working lands (e.g., organic agriculture, sustainable production, sustainable rate of harvest, regenerative agriculture).	Regenerate
						Ecosystem and/or landscape restoration (e.g., natural regeneration, habitat fragmentation, native vegetation, pollinator habitat).	Restore
						Restoration of biodiversity and ecosystem conservation (e.g., protective forests, trees along roads, buffer zones, wildlife corridors).	Restore
						Engage in forest landscape restoration.	Restore
						Restore and establish riparian buffers (e.g., streamside management, buffer zones, floodplain habitats).	Restore
						Restore wetlands (rivers, lakes, floodplains, coastal areas, and others).	Restore
						Support the ecological restoration of deforested and degraded land.	Restore
						Stewardship for the provision of multiple benefits.	Transform
						Reward sustainable land management practices.	Transform
						Leverage supply chains to transform productive systems in line with science-based targets for nature.	Transform
						Champion nature-positive policies.	Transform
						Implement practices using a place-based project as part of a jurisdictional approach.	Transform
						Reform subsidy systems.	Transform
						Advocate for integrated production systems, inter-sectoral coordination, and cooperation.	Transform
						Establish land use zoning, community mapping, spatial and environmental integrated landscape planning, decentralization, and co-management of land resources.	Transform
						Establish community forests and gardens.	Transform
						Implement actions aimed at improving access to markets for inputs, outputs, and financial services.	Transform
						Participate in agricultural conservation easement programs.	Transform
						Advocate for and implement risk sharing and transfer mechanisms.	Transform

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						Support local community rights and social safeguards (e.g., collective action pathways, respect of customary land tenure, access, and ownership, and/or social protection and adaptive safety nets).	Transform
						Adopt weather and health insurance.	Transform
						Improve policies relating to payments for ecosystem services and reducing emissions from deforestation and degradation, especially to encourage multifunctional land management (e.g., payment for enrichment plantings).	Transform
						Introduce environmental incentive structures (e.g., provide financial material or in-kind support for landscape restoration).	Transform
						Develop and apply methods that measure farm output in terms that are more than just yield per area, but include nutritional value and wider values in terms of both costs to the environment and society and benefits of a healthy landscape.	Transform
						Encourage dietary transformations (toward plant-based, whole-food diets).	Transform

This is a non-exhaustive list of possible response options companies may consider in their efforts to meet the Land science-based targets they have set. Many response options have benefits across land, freshwater, and climate targets. These actions are organized according to the AR3T framework and should be implemented in that order to achieve progress on company targets in the most efficient way according to what nature needs. These response options should be put together and packaged into an action plan that directly addresses impacts on nature and how best to reach company-specific targets. This list will be expanded over time to align with the latest targets, science, tools, and data.

SCIENCE BASED TARGETS NETWORK

GLOBAL COMMONS ALLIANCE