



Domini Forest Project

Forest-related Definitions and Goals

December 2023

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Introduction

In 2018, Domini launched a system-level approach to investing centered on forests and related lands. We selected forests because 1) they constitute a relatively discreet and definable system; 2) through their connections to climate change, biodiversity loss, and degradation of arable land they impact virtually all industries to a greater or lesser degree and hence impact our portfolios; 3) our investment policies and practices impacted them; and 4) investors were paying less attention to them than this global asset warranted given its investment implications across industries.

As our knowledge of forests and their investment-related systemic risks and opportunities evolved, we distinguished different types of forests and other related “green lands” such as agricultural systems. In 2022, we expanded the coverage of types of green lands included in our Forests Project.

As an investor managing for both the short and long term, we believe this interrelated network of forests and related lands offers opportunities and presents risks that can and should be integrated into our investment decision making. As other investors came to share this view, Domini Impact Investments joined the Finance for Biodiversity Pledge in 2020 and, in 2021, was among 30 institutional investors who signed the Financial Sector Letter on Eliminating Commodity Driven Deforestation.

Our initial efforts related to slowing global deforestation focused on the need to preserve today’s intact forests. As we progressed, we adopted specific definitions of deforestation, views on effective reforestation, the need to keep certain green lands intact, the management of commercial forest and agricultural lands, and similar matters. This document is the result of that effort.

The dates associated with the various goals in this document are our current estimates of when our efforts and external circumstances may lead to their achievement. They are subject to change as we learn more, as the environmental and political climate changes, and as actions taken today succeed in the short and long term.

Definitions – How We Define Forests

The types of green lands included in our Forests Project abound, from massive intact or protected forests to pocket parks, from biodiversity “hotspots” to community gardens, and from savannahs and grasslands to corporate headquarters’ landscapes. Drawing clear distinctions among these can be a challenge and existing definitions for these types of lands are many and varied. For our purposes as investors, we have settled on six broad-brush definitions that work as we consider risks and opportunities in our daily practice. These six categories are:

- Intact Forests
- Planted Forests—Mixed Species
- Planted Forests—Monoculture Plantations
- Agricultural Lands
- Green Spaces—Primary
- Green Spaces—Secondary

This “spectrum of green” is broad with one shade merging into another. We recognize that other definitions differently delineated exist. The definitions here, however, are the most helpful for us as investors at the current time.

Intact Forests

Generally speaking, we characterize “intact forests” as those large, contiguous primarily forested lands that are self-regenerating, undisturbed by commercial activities, and free of roads. They may be accessed by Indigenous Peoples deriving traditional low-impact livelihoods from these lands. They may include waterways, open fields, and other untimbered land such as savannahs or peat lands. These lands may or may not be legally protected as conservation areas, have status as national or regional parks, be the recognized homes to Indigenous Peoples, or be in federal, state, or private hands.

Domini’s definition is in line with that of the Food and Agriculture Organization of the United Nations, which defines “naturally regenerating primary forests as those consisting of “native tree species, where there are no clearly visible indications of human activities, and the ecological processes are not significantly disturbed.”¹

Ideally, forests of this type would fit the rigorous definition developed by the Intact Forest Mapping Project which defines “Intact Forest Landscapes” (IFLs) as requiring unbroken, contiguous lands of at least 500 square kilometers (approximately 190 square miles or 121,600 acres).

Planted Forests—Mixed Species

Generally speaking, we characterize “mixed-species planted forests” as lands primarily devoted to mixed-species management and open to the harvesting of trees for lumber, building products, or pulp and paper products. Mixed species forests can be either natural forests that are selectively harvested or planted forests that include a mixture of deciduous trees and conifers. Commercially managed forests may consist of a patchwork of mixed-species forests interspersed with monoculture tree plantations.

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We also include in this definition “agroforestry”—the hybrid practice which consists of the mixed-use combination of trees and food crops. Five types of agroforestry can be distinguished: alley cropping (crop alleys separated by tree rows); windbreaks; riparian forest buffers (trees along rivers and other waterways); multistory cropping (tree crops combined with understory crops); and silvopasture (livestock pastured among trees). These practices are also said to improve yields, enhance resilience, and sequester carbon, but do not necessarily make claims of “regenerative” practices.² Agroforestry can be include regenerative and permaculture agricultural practices.³

We include forest restoration and “tree planting” projects in this category if they intentionally consist of mixed species. Whether their ultimate goal is to create forests as intact and long-term preservation sanctuaries or as commercial mixed-use or plantation-based enterprises, these can encounter numerous sustainability challenges and their success is far from guaranteed.⁴

Ideally, all commercial mixed-species planted forests would be third-party certified to meet broadly agreed-upon, rigorous standards for sustainable management. The Forest Stewardship Council provides one such certification process. In practice, distinguishing consistently among various degrees of sustainability in forest management depends upon the rigor of third-party standard-setting and certification processes and implementation, as well as the transparency of the forest landowners.

Planted Forests—Monoculture Plantations

Generally speaking, we characterize “*monoculture plantations*” as lands devoted to the cultivation of a single species of exotic or indigenous tree, all of the same age, for use as timber, building products, pulp and paper, rubber, or similar non-food-related products. We do not include single-species plantations of food- and beverage-related trees (fruits, nuts, coffee, tea, etc.) in this definition, but rather include them in our category of Agricultural Lands.

Ideally, timber and lumber industries will abandon the classic plantation model of maximally efficient wood-product sources and address plantations’ limited ability to promote biodiversity, healthy soil, water conservation, and other nature-related services. Ultimately, the plantation concept will become more “mixed-use” or transition to such practices as agroforestry that rely less on monocultures and clear cutting.

Agricultural Lands

Generally speaking, we characterize as “*agricultural lands*” a wide variety of lands primarily used to produce foods. These can be tree and shrub plantations devoted to food (fruits and nuts) and beverage products (coffee, tea, wine); pasturing lands for livestock (cows, cattle, pigs, sheep); or crop lands for growing grains, legumes, vegetables, and other crops.

Ideally, agricultural lands would be managed according to “regenerative” agricultural principles. As the term is currently used, regenerative agriculture has many different definitions relating to its processes and outcomes. Among the processes frequently included are the integration of diverse trees, crops, or livestock; organic certification; use of crop covers; no-tilling of land; and reduced use of pesticides and fossil-fuel based fertilizers. Among desired outcomes are increased health and productivity of soil; greater biodiversity; enhanced water stewardship; improved nutritional value for

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foods; increased crop resilience; and improvements in the livelihoods and economic resilience of farming communities.⁵

Green Spaces—Primary

Generally speaking, we characterize as “*primary green spaces*” a broad range of natural landscapes dominated by tree cover and not primarily used for commercial purposes. This large, catch-all category includes lands that fall between unmanaged private or government-owned forests and those that are purely commercially managed. They include everything from national parks used for a multiplicity of purposes to purely recreational urban parks, from large-scale conservation lands to specialized wildlife refuges, from unmanaged forested land in private hands to curated arboretums and botanical gardens open to the public.

Ideally, owners of primary green spaces would intentionally manage these lands so as to appropriately balance the amounts of value creation versus any value extraction that these lands might generate. The relative balance of these two goals will vary from one type of forest to another as well as from specific circumstances. For different sorts of Primary Green Spaces, this balance varies substantially from an emphasis on public benefit to an openness to use for commercial enterprise.

Green Spaces—Secondary

Generally speaking, we characterize as “*secondary green spaces*” land owned by not-for-profit or for-profit entities that is not part of their primary business model and not a profit center. Among for-profit entities, for example, this could include lands that are rights of ways for railroads or utilities, lands maintain around cell phone towers, or lands associated with real estate development firms. We also include in this category corporate headquarter campuses, and in the not-for-profit world, municipalities’ parks, private arboretums, botanical and private gardens.

Ideally, entities with for-profit entities that have properties that can be used for green spaces would intentionally manage some portion of these lands for the public’s benefit. Doing so would signal that they view these lands and nature generally as possessing intangible value worthy of preservation.

Our Sustainability Goals for Forests

Domini has established sustainability goals for our six categories of forests, compatible with our investment objectives of “providing shareholders with long-term total return” and identifying “investment opportunities . . . that create positive environmental and social outcomes for people and the planet while seeking competitive financial returns.” Through these goals, we seek to influence practices of individual enterprises, entire industries, and societal norms that will help generate positive environmental, social, and financial outcomes for the systems of which they are a part, in keeping with our goals for overall investment returns.

Due to the dynamic nature of the complex systems to which these sorts of forests belong, we expect that the goals outlined here will evolve as the systems themselves also do so. Our goals, in effect,

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constitute ideal “scenarios” of how investors might act with regard to forest-related systems. These scenarios are not predictions, but rather they embody ideal long-term outcomes that help us maintain a flexible mindset in the face of unpredictable conditions.

Three Overall Sustainability Goals for Domini’s Forests Project

Domini has three overarching social and environmental goals for its Forests Project. While continuing to generate competitive long-term returns, Domini’s sustainability goals for forest-related forest lands are as follows:

- 1) To increase and preserve the capacity of these lands to sequester carbon and hence help mitigate the impacts and uncertainties of climate change.
- 2) To increase and preserve the capacity of these lands to support a biodiversity of flora and fauna that increases investment opportunities by, among other things, the enhancement of soil quality and the resilience of these in the face of systemic shocks.
- 3) To support and learn from Indigenous Peoples’ knowledge and practical application of low-impact ecosystems management.

Domini will pursue these three goals in the coming years and measure progress toward their achievement through two lenses.

- *Portfolios*. At the portfolio level, we will monitor and work with firms among our holdings in relation to their abilities to support these goals.
- *Systems*. At the system level, we will work to enhance the ability of these forest-related lands to generate long-term investment opportunities.

We view these goals, which differ from one type of forest land to another, as forming part of an interconnected web of land usage. Economists have historically viewed land as a substantial, or even primary, source of wealth. How it is treated and used is crucial to the long-term performance of the economy and hence our investments and is increasingly important to the sustainability of our increasingly populous world.

Domini’s Use of The Terms “Value Creators” and “Value Extractors”

In setting goals for our role investors, we distinguish between land-use management practices based on “value creation” and those based on “value extraction.” Both are essential. We believe a combination of both can help companies and investors navigate the systemic social and environmental challenges of the 21st century. Value extraction is essential because financial efficiency in the management of capital, labor, and natural resources is needed to provide affordable forest and food products to satisfy the legitimate needs of the world’s population of eight billion. At the same time, value creation is needed to preserve and enhance the foundational social and environmental systems upon which all investments are built. Value extraction tends to be short term in its outlook, while value creation looks to the long term. In the financial world, a sole focus on either one can jeopardize the other. A balance must therefore be struck between the two, creating a “hybrid” model where both operate simultaneously to varying degrees depending upon particular circumstances.

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Value creators, be they corporations or investors, share basic characteristics. Among other things, they:

- Recognize that their impacts, along with those of others, contribute to systemic risks.
- Seek solutions proactively.
- Cooperate with nature.
- Collaborate vertically, horizontally, and across sectors to scale up.
- Center on the interests of impacted communities.

For each type of forest, we distinguish between how investors can best create system-level value as well as how best to extract value at the portfolio level. Investors can use tools designed for portfolio construction to create value at the portfolio level and tools designed to manage risks and rewards at a system level to enhance overall health and resilience of these lands. We seek a balance between value creation and extraction consistent with our stated financial investment goals. We provide this background here to help clarify which of our policies and practices are intended to enhance the value for our portfolios and which enhance value creation at the system level.

Intact Forests

We include in our definition of “intact forests” large, contiguous forested lands that are self-regenerating, undisturbed by commercial activities, and free of roads. They may be used by Indigenous People deriving traditional livelihoods from these lands. These intact forests are a substantial provider of value creation in the form of ecosystem services including biodiversity, carbon sequestration, the purification, preservation, and recirculation of fresh water, and climate amelioration. They provide limited opportunities for investors at a portfolio level but offer substantial system-level advantages. We view no further loss of intact forests as an important goal. Engagement with deforestation-risk companies is a primary Domini tactic for attaining that goal, along with recognition of the traditional rights of usage by Indigenous Peoples for these forests.

Background on Intact Forests

Value Creation. Intact forests are a major source of value creation in the form of biodiversity, carbon sequestration, fresh-water purification, and climate amelioration. They are one of the primary vehicles for the support of biodiversity on land. According to the UN Farm and Agriculture Organization, “Forests provide habitat for 80 percent of amphibian species, 75 percent of bird species and 68 percent of mammal species, and tropical forests contain about 60 percent of all vascular plant species.”⁶ Research has shown that the greater the contiguous area of unmanaged forest lands, the larger the number and volume of diverse species it can support.⁷ In addition, intact forests are a refuge for old growth trees. The larger and older the individual trees, the greater the volume of carbon they can sequester annually.⁸ Large tropical forests such as the Amazon, “make their own rain”—in effect, retaining and recycling water within local systems, creating rivers of moisture in the sky that circulate water far and wide.⁹

Intact forests help mitigate climate instability at relatively little out-of-pocket expense. In addition, their multiple benefits do not raise the prospects of unanticipated, unintended consequences that the yet-untested, expensive, high-tech proposals for carbon reduction often entail.¹⁰

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Value Extraction. Intact forests create substantial value when simply left alone. Value extraction activities tend to diminish that value. At the same time, Indigenous Peoples have a history of living in harmony with intact forests in ways that sustain and steward this natural capital. These lands are part of their cultures and livelihoods. They have long had traditional rights to live on these lands. According to the World Bank, Indigenous Peoples make up approximately six percent of the world's population (476 million persons). They "own, occupy, or use a quarter of the world's surface area" and "safeguard 80 percent of the world's remaining biodiversity."¹¹

Opportunities for Investors. Investors can help preserve intact forests and their natural capital by engaging with companies involved in high-deforestation-risk agricultural products (timber, soy, beef, palm oil). They can also support Indigenous Peoples' traditional rights to use these lands and their right to free, prior, informed consent with respect to others' use of the lands.

Goals for Intact Forests

Overarching Goals for Intact Forests. Domini's primary goal is no further development and deforestation of intact forest lands, including those formally designated as Intact Forest Landscapes and others closely approximating this definition. Specifically, we believe that a goal of no construction of roads in these landscapes is an effective step in this direction.¹² As a general directional goal, the current trend toward decreases in these lands should be stopped and reversed. In addition, efforts should be made to increase intact forest lands through reforestation on previously forested lands.

Our goals also include encouraging governments, corporations, and non-governmental organizations to recognize the rights of usage by Indigenous Peoples with respect to these lands, including free, prior, and informed consent, access to their traditional lands within these landscapes, and the freedom to practice their traditional low-impact cultural livelihoods there.¹³ Moreover, interference with or violence directed against those who defend the integrity of intact forests and promote the rights of Indigenous Peoples to exercise their traditional rights of usage to such lands must end.

Portfolio-level Goals. Domini's primary portfolio-level goal is no deforestation activities in or around intact forest by companies held in our portfolios or in their supply chains.

Domini signed the *Financial Sector Commitment Letter on Eliminating Commodity-Driven Deforestation* in November 2021. Consistent with that pledge we have assessed the exposure of companies in our equity portfolios to deforestation risk from agricultural products (e.g., soy, palm oil, beef, and timber). Our emphasis in 2023 has been on ensuring that those forest-product firms in our portfolios have clearly stated no-deforestation policies and commitments to their rigorous implementation in their supply chains. Our engagement with one such firm resulted in the strengthening of the language in its no-deforestation statement in 2023. We will report on our mitigation efforts for that risk, including due diligence and engagement with high-risk firms in our portfolios. By the end of 2025, we plan to report on progress in eliminating deforestation-related risks in our portfolios, including financing. Specifically, we look to those high-risk companies in our portfolios to have adopted business practices consistent with no-deforestation related agricultural activities.

System-level Goals. Domini's long-term system-level goals at a system level are 1) an end to deforestation in intact forest lands, 2) an increase in the lands categorized as Intact Forest Landscapes, and 3) consideration of the role that of Indigenous Peoples can play as stewards of intact forests. In

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addition, by 2030 forests be explicitly incorporated into international efforts to set aside 30 percent or more of land for “nature.”

Investors’ Best Practice for Intact Forests

Portfolio Level. Investors’ primary opportunities include:

- Engage with companies in food-related industries including the largest commodity trading firms to ensure that their supply chains have established and implemented rigorous no-deforestation policies and practices throughout their supply chains.
- Evaluate financial services firms—including insurance, commercial and retail banking, and asset managers and investment bankers—to identify best practice with regard to deforestation in their financial activities including project finance. Engage with these companies to advocate for adoption of no-deforestation policies and practices.
- Advocate that timber and forest-product companies set aside a portion of land they own for use as preservation and conservation, intact forests, or otherwise protected lands.

System Level. Investors’ primary opportunities include:

- Support partnerships with governmental and non-governmental organizations’ initiatives to preserve intact forests through regulation or voluntary efforts. Encourage adoption of no-deforestation preferential purchasing legislation by governments.
- Promote a policy of “no new roads in intact forest lands.”
- Support the rights of and opportunities for Indigenous Peoples to sustainably use intact forests.

Planted Forests—Mixed Species

We include in our definition of “mixed-species planted forests” commercial, mixed-species forest land managed by large corporate entities or small and family landholders. These forest lands provide substantial opportunities for investment value extraction in the form of timber, lumber and pulp and paper products. Managed to high sustainability standards, these forests can also provide opportunities for value creation in the form of lands set aside for high-value conservation, biodiversity preservation, watershed management, and carbon sequestration, although less so than intact forests. Domini’s portfolio- and system-level goal for these forests is that virtually all mixed-species, planted forests be managed so as to include these high sustainability standards. Collaboration with standard-setting organizations to ensure rigor in maintenance, implementation, and monitoring of their standards is Domini’s primary strategy for achieving these goals.

Background on Mixed-Species Planted Forests

Value Creation. Sustainable, mixed-species forests can provide natural capital through the provision of ecosystem services. Among these are: habitat protection; protection of threatened and endangered species; fishing protection; resistance to wildfires; harvesting of forest-related products such as mushrooms, berries, honey, or fur; and public enjoyment and education. If managed under rigorous sustainability standards, these forests can sequester reasonable, although not exceptional, amounts of carbon. Because trees in these forests are typically harvested at between 25 to 100 years of age, their ability to sequester carbon in substantial quantities is limited to the latter years of this

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lifespan. The seedlings that replace them will not be able to sequester substantial amounts of carbon for several decades. Similarly with respect to biodiversity, these forests are likely to be less diverse and cover smaller contiguous areas than intact forests and support moderate, but not exceptional, amounts of biodiversity.

Value Extraction. Investors can reap portfolio-level benefits from these lands through sale of trees for timber, lumber, and pulp and paper. Under favorable conditions, they may also be licensed for other commercial purposes such as wind power. Investors may invest in such lands either directly or through stock in sustainably managed forest-products companies.

In practice, many different sustainability standards with certification schemes for forestry management currently exist. Among the earliest, most broadly recognized is that of the Forest Stewardship Council (FSC). In recent years, various environmental organizations have criticized FSC for lax standards, conflicts of interest, and failure to keep up with technologies for monitoring and enforcement.¹⁴ Domini consequently pays close attention to the rigor of FSC's policies and practices.

Investors may also purchase carbon offsets related to mixed-species planted forests as well as intact forests. The market for these offsets is currently driven by companies' and governments' "net zero" CO₂ emission-reductions pledges. These offsets serve as an alternative to reductions in their actual use of fossil fuels. Carbon offsets face a host of challenges in implementation, including measurement of carbon reductions achieved, the additionality of the investments for which offsets are claimed, and the financial value of the offsets themselves.¹⁵ An additional uncertainty arises due to threats to the ability of forested lands to sequester carbon for the century-long lives over which these offsets are often calculated. The increasing destruction of forests by wildfires and pests accounts in part for this uncertainty.¹⁶

Reforestation on previously forested lands and afforestation (creating forests on previously unforested lands) are also viable investment opportunities. Each comes with its own challenges in creating healthy, environmentally sustainable forests. Simply "planting trees" without attention to local contexts jeopardizes their prospects for success.¹⁷

Opportunities for Investors. Investors' primary opportunities lie in ensuring that these lands are sustainably managed in ways that natural capital is preserved while still operating profitably.

Goals for Mixed-Species Planted Forests

Overarching Goals for Mixed-species Planted Forests. Domini's primary goal is to create a culture in which the highest level of sustainability management standards is the norm for mixed-species planted forests. These standards and norms should be in line with the principles of regenerative agriculture and the transition to a circular economy.

Portfolio-level Goals. Domini's goal for the management of our portfolios is that virtually all companies with business models focused on the ownership of mixed-species forest lands, as well as companies that depend upon their supply chains for products from these forest lands, require a high-quality policy of sustainable management by 2025, including labor practices, and be certified for implementation of these standards by independent third parties by 2027. Sustainability of this type includes cultivation of the potential for ecosystem services provided by these forests. Domini does not

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consider the production of wood chips and pellets as a primary source of fuel as aligned with those principles.

System-level Goals. Domini’s primary system-level goals are that by 2035 virtually all management of mixed-species planted forest lands globally be conducted in accordance with sustainability practices of the highest levels. The implication of this goal is that these “best practice” standards will by then have become “standard operating procedure.”

Investors’ Best Practice for Mixed-Species Planted Forests

Portfolio Level. Investors’ primary opportunities include:

- Engage with companies to adopt and comply with highest levels of sustainable forest management standards for lands they own and for firms in their supply chains including small landowners.
- Invest directly in forest lands and manage them to high levels of sustainability while maintaining competitive levels of productivity and financial returns.
- Promote business-to-business purchasing policies that encourage high standards in forest-management practices in forest-industry supply chains.

System Level. Investors’ primary opportunities include:

- Advocate and monitor the disclosure of ecosystem services’ data by owners of mixed-species forest lands.
- Support and monitor the work of sustainability certification bodies such as the Forest Stewardship Council as well as governments to ensure high-quality sustainable forestry standards and processes, including labor practices.
- Advocate that owners of mixed-species forests convert a portion of their holdings to conservation lands or provide charitable contributions to organizations seeking to do the same, while maintain competitive business models.

Planted Forests—Monoculture Plantations

We include in our definition of “planted monoculture plantations” commercial forest land uniformly planted with one species of the same age, treated with pesticides and fertilizers, clear cut, and otherwise grown and harvested as “agricultural” products. They may be owned by large corporate entities or small landholders.

These plantations are a much-used and often-preferred source of value extraction due to their efficiency in the production of timber, lumber, and pulp and paper products. By contrast, these lands’ ability to support biodiversity and sequester carbon is far from guaranteed. According to one study, plantations vary substantially in their ability to do so “depending upon the characteristics of both the plantations and of the previous land uses.”¹⁸ Plantations’ ability to promote biodiversity, sequester carbon, and provide other ecosystem services depends on past land usage and the types of trees planted.

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Domini’s portfolio- and system-level goal for plantations is a transition of these lands to mixed-species forests, agroforestry, or other management practices that increase their ability to promote biodiversity and sequester carbon.

Background on Monoculture Plantations

Value Extraction. Given their industrial farming practices, these single-species tree plantations are more productive per acre for the growing and harvesting trees than intact and sustainably managed mixed-species forests. Consequently, they are typically favored by large timber companies.

Plantations, however, support substantially less biodiversity or other ecosystem services (e.g., protection of wildlife habitats or endangered species) than intact forests or sustainably managed mixed-species forests. In addition, they tend to sequester less carbon due, among other things, to the practice of clear cutting them after life cycles that can be as short as 20-40 years.

To increase the natural-capital profile of these lands, several forest-industry-related organizations have established sustainability principles for the management of tree plantations. In order to receive FSC forest management certification, the Forest Stewardship Council sets environmental standards for its certification of plantations’ sustainable forest management practices. It does not allow, for example, “steady use of chemical herbicides,” “frequent fertilization,” or “excessive chemical or mechanical site treatment.”¹⁹ Voluntary standards-setting initiatives for plantations have also been established by the World Business Council on Sustainable Development and the Forests Solutions Group.²⁰ Key Performance Indicators include percentage of owned-lands certified to sustainability standards, percentage of restored or conserved, and total area of any other lands they may have restored or conserved.

Initiatives such as these tend not to address the need for plantations to modify key parts of their business model—notably the uniform planting of single tree species—that contribute to these lands’ relative inability to support biodiversity and sequester carbon.

Value Creation. The sustainability challenges with plantations fundamentally stem from a conflict between their basic model—the uniform planting of single species trees of the same age—and their relative inability to provide long-term value creation. A potential solution to this dilemma lies in their transition to mixed-species forests, agroforestry, or other more rigorous, less environmentally questionable business models. Making such a transition without impacting productivity is a major challenge.

Several models for moving forward suggest themselves. One would accept the necessity to set aside a portion of plantation lands to be less “efficiently” but more sustainably managed while still satisfying overall demands for forest products. A second approach would be to require that single-species plantations be created only on already degraded lands—thereby enhancing the carbon sequestration and biodiversity of these lands—while simultaneously transitioning existing plantations to environmentally preferable models. Neither of these approaches, however, would mean substantive changes to the basic business model of single-species plantations.

A third approach would involve business model transformation. It would mean transitioning plantations to mixed-species forests or agroforestry. Agroforestry is already making inroads in cocoa, coffee, and rubber cultivation. Since these trees do not need to be felled to extract their value, they can

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be left standing while integrated with other species—be they shade trees or agricultural crops, thereby increasing the biodiversity, resilience, and carbon sequestration of these lands.

Opportunities for Investors. Given their efficiency, tree plantations can offer substantial opportunities for investors on the value extraction side of the equation. Because tree plantations also come with a cost to biodiversity, soil quality, carbon sequestration, and other natural capitals, investors have an opportunity to steer the operations of tree plantations toward more sustainable and regenerative practices that can enhance, instead of undercutting, these capitals.

Goals for Monoculture Plantations

Overarching Goals for Monoculture Plantations. Domini’s overall goal is that monoculture plantations begin to transition to high value-creation models such as mixed species forests and agroforestry by 2025, and a gradual reduction of the percentage of planted forests as plantations begins in 2028. The goal is a transition to management models that approach those of mixed-species forests or regenerative agriculture while still preserving a competitive degree of efficiency.

Portfolio-level Goals. Domini’s goal for our portfolios is that by 2025 companies using tree plantations adopt policies including sustainability and human rights standards that are generally regarded as best practice. In addition, by 2028, a preponderance of plantations will be exploring the transition to models that increase the sequestration of carbon and support biodiversity.

Moreover, at the same time, our goal is that a substantial number of companies in our portfolios that source wood and pulp and paper products from companies in their supply chains owning tree plantations will adopt preferential business-to-business purchasing policies favoring those forest product companies with policies to transition to non-plantation management models.

System-level Goals. Domini’s goal is that by 2028 best practice in the transition of plantations to sustainable management becomes standard operating procedure for forest-product companies and their supply chains. By that date, sustainability certification schemes will better reflect the environmental shortcomings of the monoculture plantation model.

Investors’ Best Practice for Planted Forests as Monoculture Plantations

Portfolio Level. Investors’ primary opportunities include:

- Advocate the transition of plantation management to approaches incorporating mixed-species forest, agroforestry, or comparable management models.
- Support legislation for preferential purchasing by governments from plantations with highest sustainability standards and advocate for similar voluntary business-to-business preferential purchasing programs to sources transitioning to mixed-species and agroforestry models.

System Level. Investors’ primary opportunities include:

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- Monitor controversial emerging issues in the management of forest plantations that pose potential environmental challenges that counterbalance efficiency gains (e.g. introduction of non-native or genetically modified species).

Agricultural Lands

We include in our definition of “agricultural lands” lands for growing crops as well as grasslands and rangelands for pasturing livestock. We also include tree and shrub farms for fruits, nuts, coffee, tea and the like. These lands may be owned by large corporate entities or small landholders.

Industrial farming practices combined with deforestation for use of land for pasturing livestock and growing crops to feed them are substantial contributors to biodiversity loss and exacerbate climate change. Managed according to regenerative agriculture processes and outcomes, crop lands can be a substantial source of biodiversity and can store moderate quantities of carbon under the right conditions. The expansion of industrial agricultural lands at the expense of intact forests and primary green spaces is a substantial contributor to biodiversity loss and climate change.

Domini’s primary goals include greater use of agricultural practices that allow for the enhancement of biodiversity and carbon sequestration while still serving the world’s demands for adequate, affordable, healthy food and maintaining profitable operations. Engagement with companies and standard setting organizations to promote the adoption of regenerative agriculture processes and outcomes is among Domini’s primary strategies for achieving these goals.

Background on Agricultural Lands

Value Creation. Agricultural lands share with mixed-species and plantation forests a range of environmental and biodiversity challenges. For example, conversion of intact forests and primary green spaces in regions such as the Brazilian rain forests and “cerrado” shrub lands to industrial agricultural production is a substantial contributor to climate change.

If carefully managed through regenerative practices, agricultural lands can provide opportunities for the promotion of biodiversity, sequestration of carbon, and recreational and touristic activities. Currently, regenerative agriculture has many definitions that focus on a combination of processes and outcomes. According to one academic survey, among the processes most commonly associated with regenerative agriculture are the increased use of cover crops, crop rotations, integration of perennials and trees, integration of livestock, and composting and other “on-farm” inputs, along with reduced use of tilling of soil and “external” inputs such as non-natural pesticides and fertilizers. Among the outputs most desired from implementation of these process changes are increased biodiversity, water health, soil health, carbon sequestration, and the strengthening of local economies.²¹ Regenerative agriculture may also include planting a diversity of crops in a single plot to raise aggregate yields and increase biodiversity.

A large portion of the diets of the world’s population depend upon three cereal crops: wheat, rice, and corn. How lands for these crops are managed is consequently of substantial importance. To promote no-tilling in the growing of these crops, the Kansas-based Land Institute has developed perennial breeds of wheat and rice that do not require the annual replanting of seeds.²²

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According to Our World in Data, 77 percent of agricultural lands are devoted to pasturing livestock and the raising of crops to feed them, with 23 percent of farmland devoted to crops other than for animal feed.²³ Moderate consumption of meat can help reduce the amounts of land currently being devoted to livestock. Other means of providing needed protein include the development of plant-based meat alternatives and manufactured bacterial proteins.

Value Extraction. Agricultural lands provide numerous opportunities for investors. Owners of agricultural land as well as commodity traders and the processors and retailers of agricultural products are among those offering such opportunities. The efficient production of crops on agricultural lands has grown remarkably since 1900.²⁴ It has come, however, at a cost to soil health, biodiversity and carbon sequestration. A major challenge is how to achieve a balance between value extraction and value creation in the production of affordable, high quality, environmentally sustainable food for a world population of more than eight billion.

Opportunities for Investors. Given the importance of soil health to the long-term prospects for agriculture and consequently to the wide range of food-related investment opportunities, investors' primary opportunity is to ensure the long-term health of this foundational asset along with other aspects of regenerative agriculture.

Goals for Agricultural Lands.

Overarching Goals for Agricultural Lands. Domini's overarching goal is to promote the development and implementation of regenerative agriculture processes and outcomes. As part of that goal, it seeks to end land conversion from intact forests and primary green spaces to agricultural land. At the same time, adequate supplies of affordable food need to be maintained without abusing the environment or labor.

Three goals may help in addressing this challenge: 1) an increase in the amount of land incorporating regenerative agriculture; 2) a decrease in the amount of land devoted to the raising of cattle and other livestock and growing crops to feed them; and 3) fair labor standards and practices throughout the agricultural products value chain. We recognize that at the current time regenerative agriculture is not as productive in the aggregate as industrial agriculture due to the need to let lands lie fallow. Transitioning some substantial amounts of lands currently using industrial agriculture to regenerative practices is nevertheless possible, as well as the reclamation of degraded agricultural lands through regenerative techniques.

Portfolio-level Goals. Our goal for the management of our portfolios is that by 2026, a preponderance of companies in our portfolios will have begun the transition to regenerative agriculture for a portion of their agricultural lands. As part of this transition, companies will incorporate commitments to fair labor practices and related human rights issues.

System-level Goals. Domini's primary system-level goal is that by 2030 a preponderance of companies in our investment universe will have adopted policies and practices based on principles of regenerative agriculture.²⁵ Ultimately the goal is at a minimum to hold the area of the Earth's land used for agriculture at current levels or reduce it. By reducing moderately the portion of that land used for livestock pasturing or growing food-crops for livestock, freed-up land could be devoted to the production of non-meat food crops farmed according to regenerative agriculture practices. Doing so would mean that total non-meat food production could be maintained at current levels while increasing

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land being farmed regeneratively. (Regenerative agriculture requires more land because it allows lands to lie fallow every year or two.) Subsidies—whether from government or food producers—will be needed for those making the transition to regenerative agriculture practices producers. Philanthropic gifts could also be an important catalyst in the process.

Furthermore, with respect to agricultural lands and food production generally, our goals include encouraging corporations and investors to recognize basic, widely accepted labor standards such as those embodied in the United Nations Declaration of Human Rights and the United Nations Guiding Principles on Business and Human Rights with respect to labor on agricultural and other forest-related lands.

Investors' Best Practice for Agricultural Lands

Portfolio Level. Investors' primary opportunities include:

- Engage food product companies and retailers to make commitments to implement regenerative agriculture principles and policies.
- Invest in protein alternatives to meat that are plant based and the fermentation of protein-rich bacteria.
- Invest in high technology companies that facilitate environmentally friendly land management.
- Invest in greenhouses, hydroponics, and vertical farms that will reduce the amount of arable land set aside for crops.

System Level. Investors' primary opportunities include:

- Promote public policies, including subsidies, that support the transition of industrial agricultural lands to regenerative policies and practices.
- Encourage moderate consumption of meat in order to reallocate a portion of grazing and pasture lands to intact forests, primary green spaces, or crops for human consumption.
- Advocate research and development on the advancement of perennial grains and legume breeds.

Green Spaces—Primary

We include in our definition of “primary green spaces” a broad range of green lands that are primarily not commercially managed but at the same time not treated as intact. They encompass public lands such as state and national parks; conservation or otherwise protected natural lands; and large tracts of forest land held in private hands and not managed primarily for commercial purposes.

Value creation through the preservation and enhancement of natural capital is typically their primary benefit, but value extraction can also be a part of their management model. For example, national forests and park lands can be leased out for timber harvesting, livestock grazing, petroleum or minerals exploration and production, or other commercial purposes.

Further complicating the history of these lands is the role of Indigenous Peoples who have long had traditional rights of usage to these lands before the establishment of legal ownership by

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governments or others. In the case of national parks, Indigenous Peoples around the world historically have often been forced to leave these lands.²⁶

Depending on circumstances, these lands can serve as sources for value creation biodiversity preservation and carbon sequestration. Investors have only ancillary opportunities to interface with these lands except through leasing lands for commercial purposes, They can support their benefits for value creation through philanthropic activities or participation in partnerships with governmental or environmental organizations. Domini's primary goal is to encourage the enhancement of primary green spaces' abilities to generate value-creation through the creation of natural capitals, while still leaving open the possibility for limited, environmentally sustainable opportunities for value extraction.

Background on Primary Green Spaces

Value Creation. Properly managed and maintained, large parks, conservation land, and even private landholdings can generate moderate to substantial amounts of natural capital in the forms of biodiversity, wildlife protection, carbon sequestration, and recreation and tourism.

In practice, large national parks and protected areas often are wholly or partially designated as conservation or protected areas. Many even contain regions meeting the definition of Intact Forest Landscapes. In practice, however, their conservation status may be poorly protected by the governments or other organizations charged with maintaining their well-being and are open to commercial exploitation.²⁷ They may also be the traditional territories of Indigenous Peoples with an historical claim to their use and proven records of stewardship, including subsistence living practices that remain in harmony with the biodiversity and long-term sustainability of these territories.

These primary green spaces can also provide the public benefits of rest, relaxation, and spiritual sustenance that access to forests, parks, and other green spaces entails. Equitable access to and enjoyment of these spaces is an important goal for green spaces of these kinds.

Value Extraction. Because these primary green spaces are generally in public hands and not exploited for commercial purposes, their benefits are in theory predominantly those of value creation. They, however, often leased out commercial purposes such natural resource extraction and mining, lumbering, livestock pasturing, and tourism. These operations can involve the building of roads through previously inaccessible territories, thereby opening the door to further incursions on these lands. Moreover, these operations not only have detrimental environmental consequences but can also adversely impact use of lands with historical cultural and spiritual value to Indigenous Peoples of the region.

Opportunities for Investors. Investors' commercial investment opportunities, when it comes to primary green spaces, are generally problematic. Investors, however, do have an opportunity for investments in fixed-income products that support local, national, and regional, projects that create environmental and societal value. So-called "green" bonds and their cousins "sustainability," "social" and similar fixed income products offer opportunities to support value creating initiatives with respect to these lands. The carbon credit markets offer similar opportunities, although they have been particularly controversial in recent years.

In addition, corporations may undertake philanthropic activities or engage in partnerships with governmental or environmental organizations that preserve, create, or enhance these spaces. Support

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for reforestation and restoration of green spaces for investment credits or carbon offsets is another opportunity, although with challenges of its own.

Finally, recent years have seen an increasing number of partnerships between national governments and Indigenous Peoples, in which the latter have been included in a key role in the stewardship of primary green spaces of substantial size. Canada and Australia have taken notable recent steps in this direction.

Goals for Primary Green Spaces

Overarching Goals for Green Spaces. Domini’s overarching goal for primary green spaces is to enhance the ability of corporations—in particular, in partnership with governmental and non-profit organizations—to protect and nurture the creation of value creation within these spaces.

Portfolio-level Goals. Domini will seek to understand how it might productively use the green bond market to enhance the stability and resilience of primary green spaces. In the coming years, we also hope to identify occasions on which we can support partnerships that allow Indigenous Peoples to play a role of stewards these primary green spaces in whole or in part.

For companies in its equity portfolios, Domini will begin, in 2025, to raise awareness about opportunities for corporate partnerships and philanthropic activities to support value creation in primary green spaces.

System-level Goals. Domini’s system-level goals are 1) by 2030, fixed-income portfolios will typically include an allocation to green bonds or similar securities with a value-creation approach for forests and related lands; 2) the focus of corporate philanthropy will eventually come to include forest-positive initiatives as appropriate given the mission of the corporation; and 3) an awareness of the potential for these primary green spaces to serve as a source of value creation will permeate the world of corporate and private land owners.

Investors’ Best Practice for Primary Green Spaces

Portfolio Level. Investors’ primary opportunities include:

- Advocate company commitments to partnerships and philanthropic activities (e.g., cash, lands, pro bono staff time, or other resources) that support the creation or enhancement of primary green spaces.
- Invest in green bonds issued by NGOs (e.g., for creation of conservation lands); by state and local authorities (e.g., for use in climate change mitigation projects or for parks, landscapes, and urban forests); or by nations and development financial institutions (e.g., for maintenance of national parks and environmental protected areas, or for green spaces used as in climate-change mitigation projects).

System Level. Investors’ primary opportunities include:

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- Invest in bonds of nations, quasi-governmental bodies, and development financial institutions that promote economic development through forest-positive initiatives (e.g., ecotourism, regenerative agriculture).

Green Spaces—Secondary

We include in our definition of “secondary green spaces” land owned by not-for-profit or for-profit entities that is not part of their primary business model and not a profit center. Among for-profit entities, for example, lands that are rights of ways for railroads or utilities, lands maintained around cell phone towers, and lands associated with real estate development firms. We also include in this category corporate headquarter campuses, and in the not-for-profit world, municipalities’ parks, private arboretums, and botanical and private gardens.

With the exception of arboretums and botanical gardens, these parks and other secondary green spaces typically provide only limited abilities to promote biodiversity or carbon sequestration but do provide mental and physical health benefits and signal to employees and the general public a respect for nature and its intangible value-creation abilities.

Background on Secondary Green Spaces

Value Creation. For industries such as utilities, cell phone tower companies, and real estate development firms, land management is an ancillary necessity in their basic business model but is not a primary focus or a profit center. Developers of large office parks or residential communities, for example, can have extensive biodiversity plans. Farmers occasionally leave “biodiversity” borders on productive fields or leave land untouched along streams on their properties voluntarily or by mandate.

Corporations often have large campuses at their headquarters that can be landscaped with biodiversity or other natural capital benefits in mind. Biodiversity preservation is a primary concern for many arboretums and botanical gardens. In the aggregate, these lands can play a role in promoting biodiversity and preventing its loss. Moreover, they can “signal” to the general public that the firm sees value in preservation and enhancement of natural lands.

Value Extraction. The opportunities for corporations and investors to extract value directly from small green spaces is limited. Companies can cultivate green spaces near their facilities as a benefit for employees to enhance mental and physical health or enhance its public image.

Opportunities for Investors. Investors can invest in “green” municipal bonds that help cities and other localities fund parks and other “urban forests.” Their philanthropic programs can support arboretums or botanical gardens. They can also encourage companies to invest in the upkeep of their secondary green spaces as a tangible and intangible benefit for their employees and enhancement of their public image. In doing so, investors can use small green spaces as a signal that they themselves and the companies they invest in derive intangible value from nature in and of itself.

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Goals for Secondary Green Spaces

Overarching Goals. Domini has not currently set specific goals for secondary green spaces.

Portfolio-level and System-level Goals. Domini informally monitors environmental positives or negatives that arise for companies in the utility, cell tower, real estate development, and other industries where land ownership is built into their business models. We have not set specific standards for the management of these spaces.

System-level Goals. Ultimately, we would like to see corporations' management of small green spaces include such considerations as biodiversity, restoration of degraded lands, and promotion of native species. Moreover, these considerations could be integrated into companies' business models as part of their overall environmental management systems, as opposed to being viewed as an administrative "landscaping" expense. For example, cell-tower telecommunications firms can incorporate biodiversity planning in their management of their sites.

Investors' Best Practice for Secondary Green Spaces

Portfolio Level. Investors' primary opportunities include:

- Encourage companies to consider secondary green spaces as part of their business models and environmental management programs.

System Level. Investors' primary opportunities include:

- Advocate that companies intentionally invest in their secondary green spaces in order to signal their valuing of biodiversity specifically and nature in general.

Goal Setting and Land Use

As Domini delved into goal setting for the Forest Project, we eventually confronted the question of whether we should set specific goals for the amount of land globally allocated to the six types of forests we had defined.

We had found figures for current land usage globally for these types of land. Some took us aback. Approximately 46% of habitable land was devoted to agriculture, and 77% of that land was in turn set aside for the raising of—and the growing of crops to feed—livestock. Those both struck us as surprisingly large numbers. Urban space took up only one percent of habitable land: that seemed like a small figure. Seven percent was devoted to commercial forestry—again, a seemingly small number. And intact forests and primary green spaces occupied 36% of available land: not an insignificant amount of land still in largely undisturbed forests.

It also became clear that those numbers were interconnected. Global land is in fact a zero-sum game of competing claims. If the world needs more agricultural or forest products, that land would

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need to come from intact and primary green spaces. And vice versa: if the goal was to preserve natural forests or add to them, then that would mean no expansion of agricultural lands.

Of course, increased productivity on agricultural lands could solve the need for more food without additional land conversion. But does that imply that the current distribution of global land use just happens to be the optimal one?

When we began the Forest Project, we didn't anticipate this and similar questions. For example, is today's allocation of land-use globally "ideal?" Should some allocations be larger and others smaller? Has anyone declared what these numbers should be? Could anyone reasonably be expected to do so? Should investors and corporations play a role in these decisions? Do they already? Will these numbers change in the future? Should we as investors have a view as to what those changes should be? And so on.

It gradually dawned on us that we as humans now exercise direct control over how all habitable land on Earth is being used. Perhaps that should not have been a surprise. And yet, there it was. But for us as investors to be answering such questions appeared overly ambitious. Who were we, or who is anyone for that matter, to intentionally set such a goal? But . . . to advocate "no more deforestation," as we do, is doing precisely that.

In the end, we as investors need to contend with two hard facts. First, 21st century systemic social and environmental risks such as climate change, biodiversity loss, income inequality or poverty alleviation are now global in scale and involve decisions—intentional or unintentional—about global resource allocation. In the case of forests, they involve the allocation of use of the Earth's habitable lands. Decisionmaking with global implications also is implicit in other systemic social and environmental risks. Doesn't what we call "climate change" really involve a global decision about the chemical composition of the Earth's atmosphere that we view as optimal? Doesn't addressing income inequality involve a decision about how much of the wealth created by the global economy will be allocated to whom and in what amounts? Don't worldwide conservation campaigns involve human decisions about which other species are to be saved or lost? For better or worse, contending with global systemic risks and opportunities ultimately involves global allocations of resources.

In the end, these allocation decisions will be made by some combination of government, corporations including financial institutions, and civil society. What role exactly each will play will be contentious, but each has a role to play. What the optimal balance of these three great societal forces is at any given time will depend on the particularities of the specific challenges, historical and cultural precedents, societal norms, and current circumstances—and will change not only from time to time, but from place to place.

As to the role of investors and corporations, the huge financial assets that they have at their disposal impact directly or indirectly these 21st century challenges with their risks and opportunities and, as stewards of these assets, they therefore have a responsibility to acknowledge and understand their role in managing those risks and opportunities.

What are the implications of this line of thinking for Domini and the Forest Project? One is that to some extent we cannot avoid answering questions about the relative allocation of habitable lands, as tentative as those answers may be.

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There appear to us to be two ways of approaching this task. Neither yields entirely satisfactory, but together they suggest at least desirable directions.

The first is to ask: if the population of the world is headed toward 10.4 billion by 2100, how much land will it take to adequately feed them and provide them with forest products? Can the 46% of habitable land already allocated to agriculture contend with that growth? And the same for land needed to supply enough pulp and paper products and lumber. Are additional agricultural or commercial forest lands needed and, if so, where will they come from?

One possibility is that existing forest and shrub lands must be converted to industrial agriculture and monoculture plantations. Or, perhaps degraded lands no longer useful for agriculture or forests must be restored. Restoration tends to be expensive, at least if one wants lands restored expeditiously. So, deforestation is likely to be the preferred option.

For those of us who are concerned about climate change and biodiversity loss as long-term investment risks as well as short-term ecological ones, more deforestation is not a desirable outcome. Forest lands are not only desirable, but also necessary, as sinks for carbons and sites for biodiversity preservation for climate stability and ecological resilience.

As an alternative, we might look to increase the productivity of these lands. Historically, the productivity of the agricultural industry has found various ways to increase, including use of pesticides and fertilizers; genetic engineering and breeding of new, more productive variations on crops and livestock; and advances in the use of information technology. Many of these advances have also come with environmental costs that contribute to soil degradation, biodiversity loss and climate change. On the horizon are more radical solutions like enlisting bacteria to produce protein flour or growing meat in laboratories.

One alternative is to revert to one or another variation on regenerative agriculture that can directly enhance biodiversity and soil health and has positive implications for mitigating climate change. Aggregate productivity is a challenge as we go down that route because these practices involve letting lands lie fallow. As George Monbiot puts it. "Food, while produced within environmental limits, must be healthy and affordable. This is a massive challenge."²⁸

We know that famine and food shortages on a large scale are profoundly destabilizing. Over the course of history, we have seen the results of such crises, most recently in the civil disruptions in Sri Lanka when a planned nationwide transition to organic fertilizers was mishandled.²⁹

But the devastation that can be inflicted on agriculture by climate change and biodiversity loss is not going to go away. We are probably in for decades of the increased severity of droughts, floods, wildfires, and infestations of bark beetles and other pests. Granted, the extent and timing of these disruptions are unpredictable. Already, however, we can see the crises they are provoking in countries with greatest vulnerabilities. In Malawi, for example, climate change is forcing small landholders to give up industrial agriculture practices and return to more resilient traditional farming methods.³⁰

Between now and the end of this century, global agriculture and commercial forestry will not necessarily need more land but will need to become more resilient in the face of climate change. Deforestation and industrial agriculture in its current form will only accelerate the disruptive aspects of climate change and undermine the global resilience of fertile lands. We therefore believe that investors

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can usefully adopt policies promoting changes in basic agriculture and forestry practices, rather than policies that lead to conversion of intact and primary green lands to agriculture as currently practiced.

Our directional goals for land use therefore are as follows.

- Lands devoted to the preservation and enhancement of intact forest landscapes and primary green spaces should increase.
- Lands devoted to agriculture should decrease and be freed up for reforestation or afforestation programs.
- Lands devoted to monoculture tree plantations should decrease and be transitioned to multi-species forests and agroforestry lands.
- Secondary green spaces should be managed so as to signal a cultural change that reflects the intangible value of nature.

To achieve these goals, two things need to happen at a fundamental level.

The business models of agricultural- and forest-product companies need to transition from ones focused primarily on short-term value extraction to ones that incorporate long-term value creation as well: in short, hybrid business models that seek to balance the two. Investors have a direct and constructive role to play in promoting that transition.

Second, a broader cultural transition needs to occur from one where nature is seen primarily as a source of wealth extraction to one that honors the preservation of its intangible value. Investors and the corporations they invest in can play a constructive role in that transition by embodying that shift in their daily practice.

The specific portfolio level, and system level goals that we have envisioned for each type of forest above—and the corresponding actions that investors might take in the short and long term—are driven by these assumptions for the direction of land-use for which as a global society we now share responsibility.

Current Global Land Use by the Numbers

According to Our World in Data, 71 percent of the globe's surface is covered by oceans, leaving 29 percent for land. Of that land, 29 percent is uninhabitable (10 percent glaciers and 19 percent barren land). Of that habitable land, 38 percent is forest land; 14 percent shrub land; 46 percent is devoted to agricultural lands. Of those agricultural lands just over three-quarters is taken up by the production of livestock, dairy and crops for that livestock. That leaves 23% of agricultural lands for other crops.³¹ See Figure 1.

Figures cited by the UN Farm and Agriculture Organization using different categorizations of land show agricultural lands occupying approximately 38 percent of the world's dry lands, with one-third of that being devoted to crops and the remaining two-thirds to pasture and grazing lands for livestock.³² FAO's data also shows that of all forested land, 34 percent is covered by forests considered "primary" and corresponding approximately to the definition of "intact" forests used by Domini. An additional 59 percent is covered by "other naturally regenerating" forests, which fall generally into the category Domini calls "primary green spaces." Of the remaining seven percent of forest lands, three percent is

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devoted to “plantation” forests, which we call “planted forests—monoculture plantations” and four percent as “planted” forests, which we term “planted forests—multi species.”³³

The 2030 *Nature Compact* adopted by the G7 in 2021 set a goal of 30 percent of land set aside for “nature.” The G7 Compact states that “Nature, and the biodiversity that underpins it, ultimately sustains our economies, livelihoods and well-being . . .” and that “Tackling deforestation, including by supporting sustainable supply chains and demonstrating clear domestic actions” involves support for “sustainable supply chains that decouple agricultural production from deforestation and forest degradation, including from illegal land conversion.”³⁴

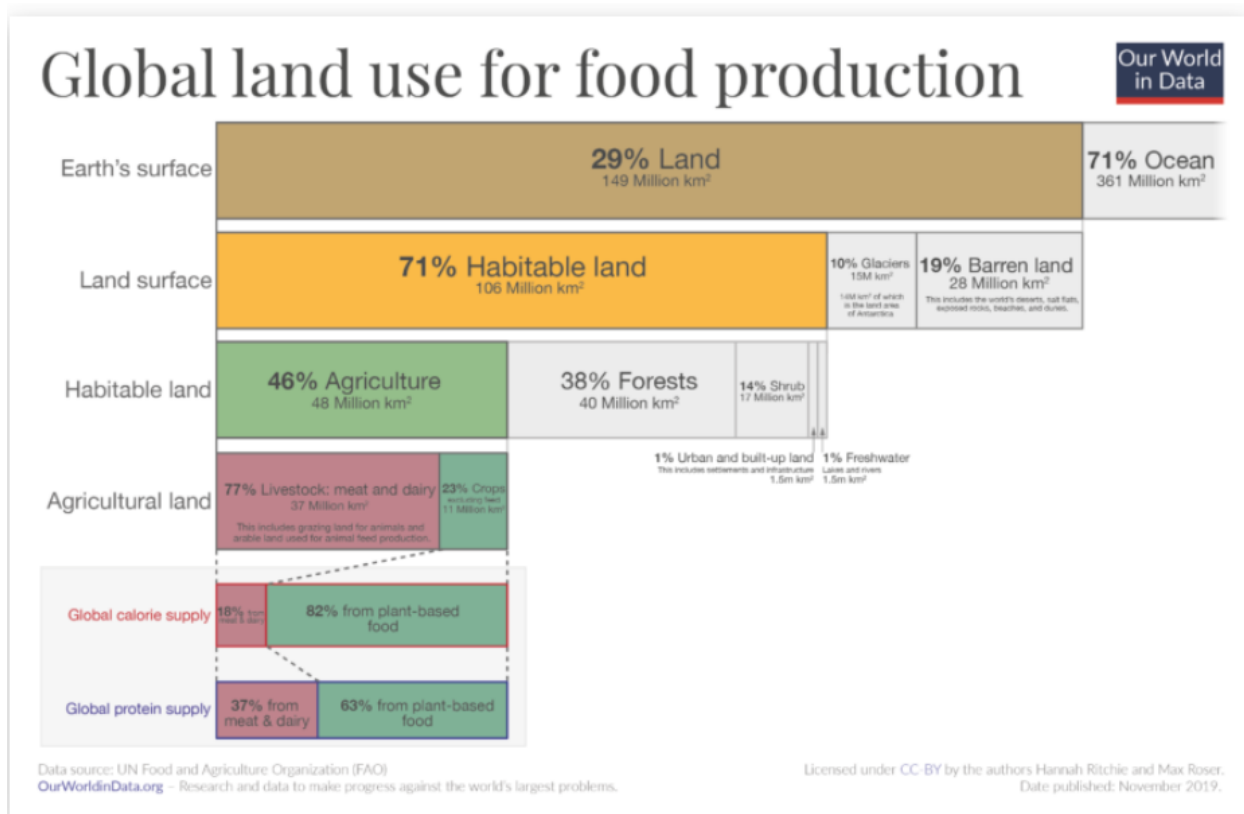


Figure 1. Land Use by Type
Source: Our World in Data

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² Michele M. Schoeneberger, Gary Bentrup, and Toral Patel-Weyand. *Agroforestry: Enhancing Resiliency in U.S. Agricultural Landscapes Under Changing Conditions* (U.S. Department of Agriculture: Washington D.C.) November 2017.

³ For the differences between agroforestry and permaculture see, for example, Chelsea Green Publishing "Agroforestry versus Permaculture: Which Approach to Use for a Community Food Forest".

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- ⁴ For one account of these challenges see Henry Paulson. “Planting Trees Is Not a Panacea—We have to Save Existing Forests” *Financial Times* (U.S. Edition) July 22, 2022:17.
- ⁵ Peter Newton et al. “What Is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes” *Frontiers in Sustainable Food Systems* October 2020, Vol. 4. .
- ⁶ Op. cit. Food and Agriculture Organization: xiii.
- ⁷ John W. Reid and Thomas E. Lovejoy. *Ever Green: Saving Big Forests to Save the Planet*. (New York: W.W. Norton & Company) 2022: 20-26.
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- ⁹ John McKenna. “These Trees in the Amazon Make Their Own Rain” (World Economic Forum: Future of the Environment) August 25, 2017..
- ¹⁰ See Elizabeth Kolbert. *Under a White Sky: The Nature of the Future* (New York: Crown Publishing Group) 2021 for background on a number of these techniques.
- ¹¹ World Bank. “Indigenous Peoples”
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- ¹³ Op. cit. Food and Agriculture Organization:84.
- ¹⁴ Earthsight. “FSC Is No Longer Fit for Purpose and Must Urgently Reform” Open letter from a coalition of multiple environmental organization. October 25, 2021.
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- ¹⁸ Leah L. Bremer and Kathleen A. Farley. “Does Plantation Forestry Restore Biodiversity or Create Green Deserts? A Synthesis of the Effects of Land-use Transitions on Plant Species Richness” *Biodiversity and Conservation* Vol. 19. 2010:3893-3915
- ¹⁹ Forest Stewardships Council. “Forest Plantations” FSC-US Questions and Answers for Family Forest Owners.
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- ²¹ Peter Newton, Nicole Civita, et al. “What Is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes” *Frontiers in Sustainable Food Systems* October 2020.
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- ²³ Our World in Data “Land Use”.
- ²⁴ Hannah Ritchie and Max Roser. Charts at the Our World in Data “Crop Yields” (2017, revised 2021).
- ²⁵ As of 2022, companies had set a 2030 goal for the regenerative management for 18% of U.S. agricultural lands. Source: Julie Creswell. “Reluctant Recruits to Climate Effort” *New York Times* July 9, 2022:B1.
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- ³³ Op. cit. Food and Agriculture Organization. 2020:15-16.
- ³⁴ G7 2030 *Nature Compact*.

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