

Roadmap to Nature Positive: Foundations for the agri-food system

→ *Deep dive: Coffee production in Sidama, Ethiopia*



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Executive Summary

The nature-related dependencies, impacts, risks and opportunities (DIROs) that global agri-food companies face today are highly local and require context-specific assessment, planning and action. Recognizing the inherent link between agriculture and landscapes, World Business Council for Sustainable Development (WBCSD) has undertaken an initial series of nature-positive deep dives into distinct production systems.

This deep dive demonstrates nature-related DIROs, leading practices, context-specific resources and unresolved challenges for the coffee production system in Sidama, Ethiopia. Our methodology aligns broadly with the locate, evaluate, assess and prepare (LEAP) risk and opportunity assessment approach recommended by the Taskforce on Nature-related Financial Disclosures (TNFD).

Table 1: Summary of guidance findings, using the “locate, evaluate, assess and prepare” (LEAP) risk and opportunity assessment approach recommended by the Taskforce on Nature-related Financial Disclosures (TNFD)

Locate <i>the interface with nature</i>	Evaluate <i>dependencies & impacts</i>	Assess <i>risks & opportunities</i>	Prepare <i>to respond & report</i>
<p>Relevant for any company that sources, supplies, or finances coffee from the Sidama region, Ethiopia.</p> <p>Focus of guidance is on agricultural production as the primary land-use stage, though upstream (inputs) and downstream (trading & distribution, processing & manufacturing, retail) activities were assessed with a lighter touch.</p> <p>Geolocation & biomes:</p> <ul style="list-style-type: none"> → 6,538 km² → Tropical/Subtropical montane rainforests → Tropical/Subtropical dry forests and thickets → Derived semi-natural pastures and old fields → Permanent upland streams <p>Biodiversity overall risk: Medium</p> <p>Biodiversity hotspot: Yes</p> <p>Includes key biodiversity areas (KBAs): Yes</p> <p>Water stress: Medium/high</p>	<p>Production dependencies:</p> <p>Very high:</p> <ul style="list-style-type: none"> → Genetic materials → Ground water → Surface water → Soil quality → Water flow maintenance → Climate regulation → Flood & storm protection <p>High:</p> <ul style="list-style-type: none"> → Pollination → Dilution by atmosphere & ecosystems → Buffering & attenuation of mass flows → Disease control → Pest control <p>Production impacts:</p> <p>Very high:</p> <ul style="list-style-type: none"> → Water pollutants <p>High:</p> <ul style="list-style-type: none"> → Terrestrial ecosystem use → Water use 	<p>Risks:</p> <ul style="list-style-type: none"> → Shift in suitable coffee growing areas. → Coffee species-specific threats exacerbated by increased global temperatures and diseases. → Challenges in demonstrating EUDR compliance <p>Opportunities:</p> <ul style="list-style-type: none"> → Increased yield through tree stumping → Roll-out of climate-resilient coffee varieties 	<p>Priority actions:</p> <ul style="list-style-type: none"> → Finance training and incentives for tree rejuvenation → Provide access to climate-resilient coffee varieties → Implement wastewater treatment facilities → Implement living income and improved contractual policies → Provide technical training and saplings, enabling the implementation of agroforestry practices

Introduction: *Landscape deep dives*



Introduction:

Landscape deep dives

To support the journey of agri-food companies to nature-positive system transformation, WBCSD has developed a [Roadmap to Nature Positive: Foundations for the agri-food system for the row crop commodities subsector](#) (row crops summary hereafter). This deep dive is one in a series of landscape studies that build upon the [Roadmaps to Nature Positive: Foundations for all Businesses](#) (foundations guidance hereafter).

The foundations Roadmap provides how-to guidance on applying [High-level Business Actions on Nature](#) in value chains, assessing and disclosing material risks and opportunities (aligned with the TNFD) and preparing to set science-based targets for nature (aligned with the [Science Based Targets Network \(SBTN\)](#)).

WBCSD has designed the foundations guidance for use along the complete agri-food value chain and across all stages of the corporate nature maturity journey. WBCSD addresses cross-sector framing, concepts and definitions in this guidance. These publications form a single package intended for joint use.

Nature-related dependencies, impacts, risks and opportunities (DIROs) are highly local and actions to address them are distinct from climate change mitigation, which generally includes more global considerations. Recognizing the inherent link between agriculture and the land, WBCSD has undertaken an initial [series of nature-positive deep dives](#) into distinct production landscapes.

WBCSD member companies consider these sub-national regions – characterized by growing agricultural production/intensification or containing biodiversity hotspots – as high priority

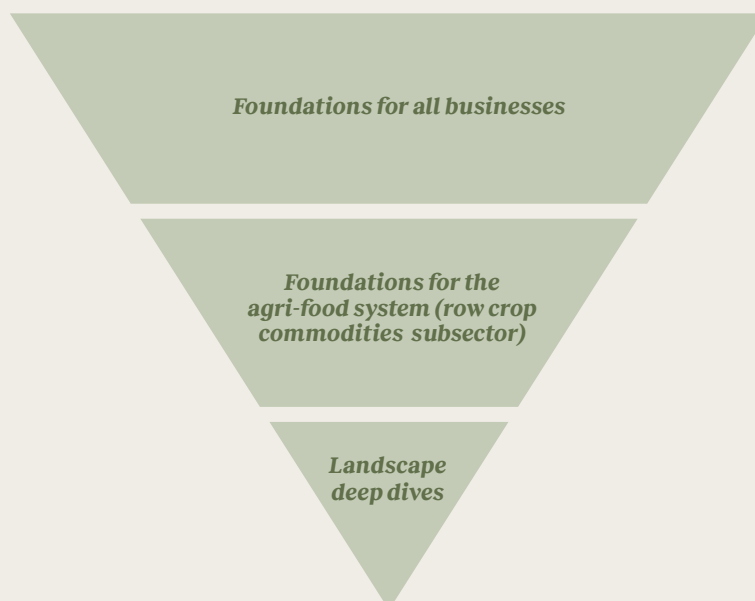
operating/sourcing regions. In other words, an agri-food company with global exposure would likely determine that these landscapes, if part of its value chain, require specific nature-related assessment, commitment and action.

Each deep dive explores key nature-positive questions for agri-food companies, aligned with the locate, evaluate, assess and prepare (LEAP) risk and opportunity assessment approach recommended by the TNFD:

- **Scope and locate:** Where should I focus, both in my value chain and geographically?
- **Evaluate materiality:** What should I focus on, considering both nature-related dependencies and impacts?
- **Assess risks and opportunities:** Why does this matter for my business and key stakeholders?
- **Prepare to respond and report:** What actions should my company be taking, individually and collectively with others? What barriers and trade-offs do I need to consider? How should I approach nature-related disclosures?

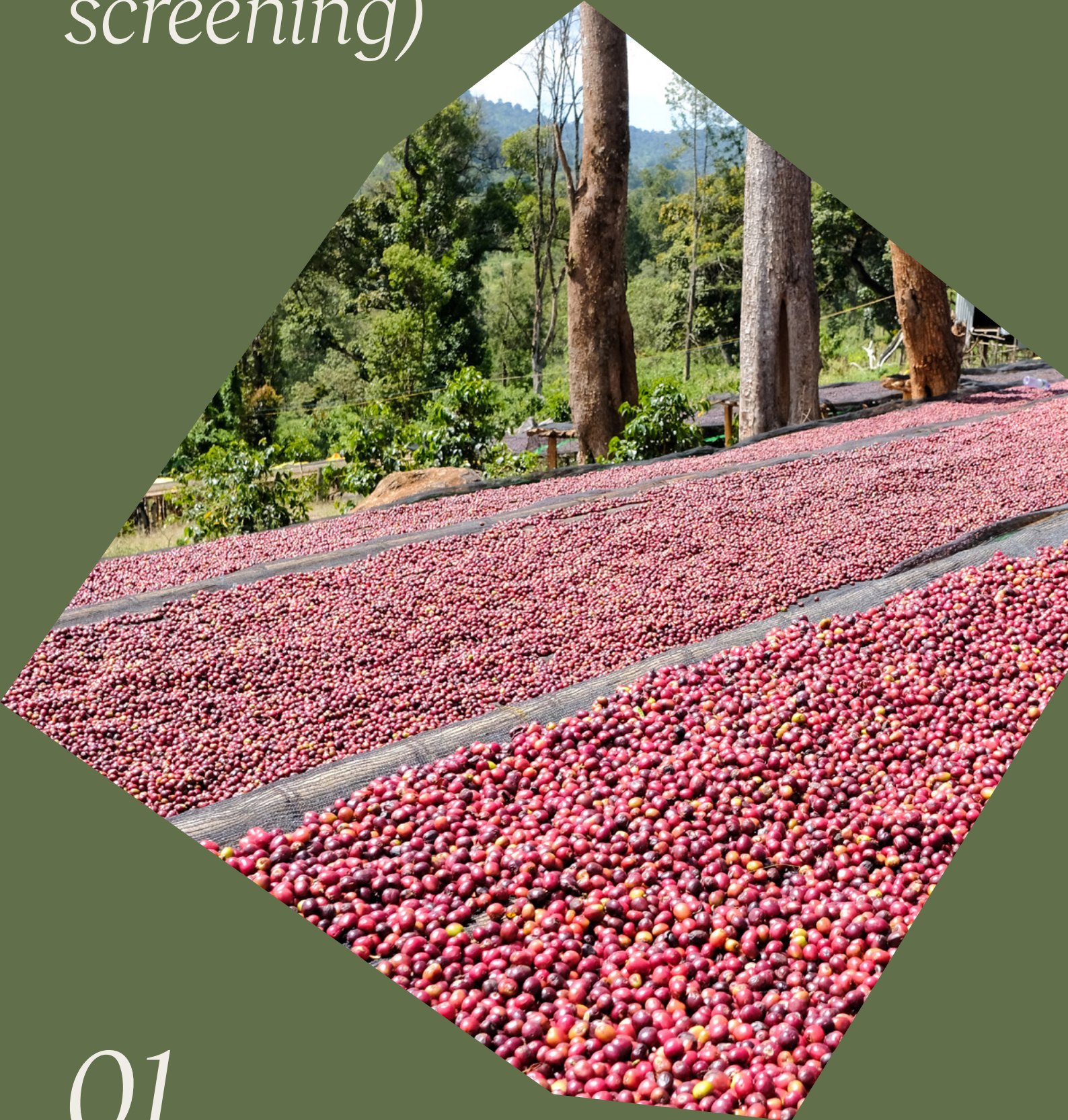
The deep dives explore nature-related DIROs, leading practices, context-specific resources and unresolved challenges for what SBTN considers high-impact commodities, meaning “raw and value-added materials used in economic activities with material links to the key drivers of biodiversity loss, resource depletion and ecosystem degradation.”¹ These commodities are among those with the largest land-use footprint in areas of high conservation value, posing the greatest nature-related risk.²

Figure 1: WBCSD’s initial nature-positive guidance for agri-food companies includes supporting deep dive assessments



→ **Note that this deep dive relies on concepts and methods explained in the [foundations guidance](#) and [row crops summary](#). Please refer to these resources for detailed supporting guidance.**

Stage 1: *Assess (materiality screening)*



01.

Stage 1: Assess (materiality screening)

Agri-food businesses (meaning any company engaged in this value chain) should first identify their main sectors, sub-sectors and parts of the value chain and their location. If a company sources, supplies or finances coffee from the Sidama region, this would be a priority location in its nature-positive strategy and this guidance will be relevant. Certain aspects of this guidance may also be relevant for coffee production in other landscapes but it is important to assess each location independently.

See [Annex 1](#) for further details on this location and tools supporting this stage.

Stage 1.1 Scope & locate

Sidama, Ethiopia

Experts widely consider Ethiopia as the birthplace of coffee and the home of wild Arabica coffee. It is the largest coffee producer in Africa and the world's fifth biggest producer. As the only species grown in Ethiopia, Arabica coffee plays an important role in the country's economy, generating about 30-35% of the country's total export earnings and providing an income for at least 15 million people in the country.³ It also has a significant cultural role: people in the country consume 50% of Ethiopian production. Around 2.5 million farming households produce coffee in Ethiopia, most of whom work on less than two hectares of land (only 5% of the total coffee grown in the country comes from large-scale plantations).^{4,5}

Sidama – the second smallest regional state in the country – is the name of both the Sidama people and Sidama territory. It is one of the major coffee-producing regions in Ethiopia (benefitting from the "Sidamo" trademark), supplying over 20% of washed coffee to the central market. The majority of the Sidama population are smallholder agriculturalists, while less than 10% live in urban areas.⁶

The agroecology of Sidama varies between highland (above 2600 meters above sea level) and lowland altitude, with the main coffee growing areas situated between 1,500 and 2,300 meters.⁷

The general categorization of coffee production systems in Ethiopia are of four types: forest coffee, semi-forest coffee, garden coffee and plantation coffee.⁸ In the southern/southeastern region, farmers predominantly produce it under a garden system, processed as washed coffee and designated as Sidamo and Yirgacheffe coffee for marketing purposes.⁹ Garden coffee is a production system commonly found on homesteads and consists of other crops (such as enset, banana, fruit trees, root crops, vegetables, spices, maize, khat, etc.) with no or few shade trees.¹⁰

Figure 2: Located in the south of Ethiopia, Sidama is one of Ethiopia's three trademarked coffee regions



There are four different ways to produce coffee in Ethiopia:

- **Forest coffee** – growing wild in natural forests and harvested by local communities.
- **Semi-forest coffee** – harvested from semi-wild plants in forest fragments where farmers thin the upper canopy and slash the undergrowth annually.
- **Garden coffee** – farmed on family plots, with traditional and improved varieties produced organically and often intercropped.
- **Plantation coffee** – commercial farms planted by the government or private investors for export purposes. This coffee plantation farming system usually uses fertilizers and herbicides.

Sidama farmers use indigenous knowledge passed down through generations to manage coffee farms. This includes techniques like intercropping coffee with other crops, which enhances soil fertility, conserves water, and reduces the need for chemical inputs. Many Sidama farmers rely on organic farming methods that align with their traditional practices. These methods include the use of compost and natural pest control, which contribute to the production of high-quality, chemical-free coffee. Indigenous knowledge also guides the harvesting and processing of coffee. For example, the Sidama people have perfected the timing of cherry picking to ensure only ripe cherries are harvested, which is critical for the flavor and quality of the coffee. Traditional processing methods, such as natural drying on raised beds, are also widely practiced and help preserve the coffee's unique characteristics.

The coffee value chain

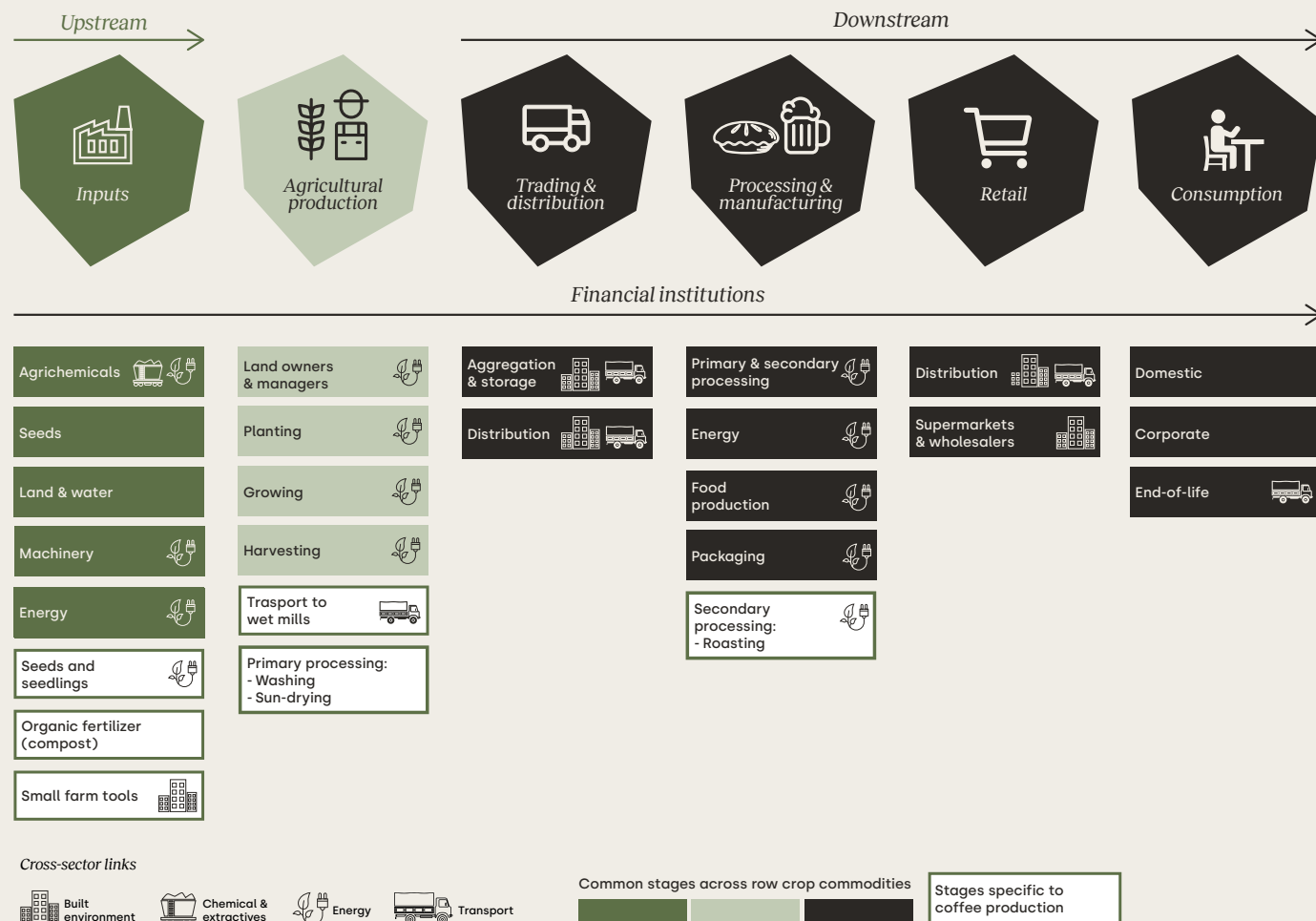
In alignment with TNFD and SBTN guidance, companies should assess their complete value chain, including direct operations and relevant upstream and downstream activities. This roadmap considers six value chain stages, grouped under three broad headings. The main focus is on agricultural production as the primary land-use stage, though we have assessed upstream and downstream activities with a lighter touch.

Typically in Sidama, smallholder farmers harvest coffee cherries and sell them to cooperatives or private traders who process the coffee at coffee washing stations (other actors in the value chain may also be involved).¹² The Sidama Coffee Farmers' Cooperative Union (SCFCU) sells a significant amount of the coffee from this region. It is the second largest cooperative union in Ethiopia, made up of 67 primary societies and representing over 80,000 farmers.

After processing, coffee exporters in Addis Ababa buy the beans and send them to roasting plants (mostly abroad). Domestic consumption accounts for half of total coffee production, with daily household rituals including home roasting.¹³



Figure 3: The generic coffee supply chain in the Sidama Zone, including key cross-sector links. Adapted from: Zana, T., & Abayneh, H. (2018)¹¹



Stage 1.2 Evaluate impacts & dependencies

Agri-food companies should next prioritize the potentially high impacts and dependencies on nature typical for the business and associated value chains for further assessment. This section summarizes the process and key findings of WBCSD's landscape assessment, based on desk research and interviews with key local stakeholders throughout the private, public and civil society sectors. The process outlined here – and in further detail in the row crops summary – applies to any agri-food company evaluating nature-related materiality in its operating or sourcing regions, while the specific findings below are relevant to those engaged directly or indirectly in Sidama. See the materiality matrixes ([Table 2](#) and [Table 3](#)) for the primary outputs of this materiality screening, aligned with the structure and methods of the leading nature-related assessment tools and frameworks.

Overview

Compared to other producing areas, Sidama coffee has relatively low environmental impact. However, the smallholder farmers who produce the coffee are increasingly exposed to climate-driven risks, impacting yield and revenue from coffee production. These risks may drive farmers to switch to less environmentally friendly practices and crops.

Farmers produce Sidama coffee in a garden system, mixed with other subsistence crops without many external inputs (fertilizers and pesticides). They do not produce it in monoculture or mechanized systems and there is minimal on-farm processing. The largest environmental impact is on water quality due to high organic matter concentration from the mix of coffee pulp and wastewater in wet mills.

Agri-production

Water pollution

Local communities need rivers to provide for their families and process coffee. Mills use the traditional wet method to process most Ethiopian coffees, including those from Sidama, using the traditional wet method: de-pulping the coffee cherries, fermenting the beans in water for two to three days and washing them to remove the leftover mucilage.

Wet mills use a large quantity of water (on average 15 liters per kg of beans¹⁴) for pulping, fermentation and washing of the coffee berry with no recirculation. This process creates large amounts of highly concentrated wastewater, which they typically hold in evaporation ponds that can overflow into rivers in peak season. Coffee processing generates two main solid by-products: coffee pulp and husk. These by-products cause environmental pollution when disposed of directly into arable land and surface water.

Recent studies have found that the raw wastewater of coffee processing plants in Sidama has a high concentration of organic matter, nitrate, phosphate and solids that is much higher than the national and international standard limits. The same is true for the river water quality, threatening local biodiversity.¹⁵ This wastewater may also infiltrate into ground water and become the main threat to both ground and surface water quality. Effluent discharges also impact community members, particularly those living downstream from coffee processing plants, with river water becoming polluted and unfit for drinking, recreation, irrigation and animal watering.¹⁶

Climate change and precipitation patterns

There is evidence that climate change is reducing the areas suitable for coffee growing, limiting yield and increasing the risks of pests and disease.¹⁷

Climate change has already started bringing changes in precipitation patterns in Ethiopia, putting pressure on the rainfed farms of Sidama. A study looking at 25 years of rainfall data through 2016 showed a mix of increasing and decreasing rainfall trends, during which farmers might have experienced difficulties with establishing plans for production. Climatic extremes and seasonal and year-on-year variability of rainy days are of concern in Ethiopia and will require robust adaptation strategies to guarantee future rural livelihoods.¹⁸

Rising temperatures will bring greater weather variability, increasing and decreasing rainfall trends and make severe droughts more likely, drying the soils faster, putting extra stress on the plants and reducing the quality of the beans. By the middle of this century, average temperatures will have increased by over 2 degrees Celsius across much of Ethiopia, with the end of the century seeing in excess of 4 degrees Celsius of warming.¹⁹



Land-use change

Ethiopian coffee farm yields are relatively low compared to other major coffee producing countries, with an average productivity of 0.64 metric tons per hectare for un-stumped trees in 2019, compared to 1.65 metric tons per hectare in Brazil and 2.79 metric tons per hectare in Vietnam.²⁰

This is because Sidama's coffee trees are considerably older: farmers established the systems decades ago, sometimes over 70 years, resulting in about 80% of the trees classified as old coffee.²¹

The aged coffee tree stock means there is a minimal link historically between coffee production and deforestation in Sidama, although other parts of Southern Ethiopia have recently seen coffee-driven deforestation. However, the low productivity of aged trees and low income due to small farm sizes has led some farmers to expand their farms as they seek to improve their livelihoods.

Population growth and land fragmentation pose challenges to the traditional land management systems. As land is divided among more people, there is a risk of overuse and degradation, which could affect coffee production.

GHG emissions

There is little climate-related life cycle assessment (LCA) data available for Ethiopian coffee and the majority of global studies focus on methods not used in Ethiopia. However, a study comparing sustainable farming methods with conventional farming for Arabica coffee in Brazil and Vietnam found greenhouse gas (GHG) emissions to be considerably lower under sustainable farming and that the contribution of agri-production itself is small compared to other stages of the value chain.²⁴ Exporting and processing (including packaging) connect to most GHG emissions from the coffee value chain.

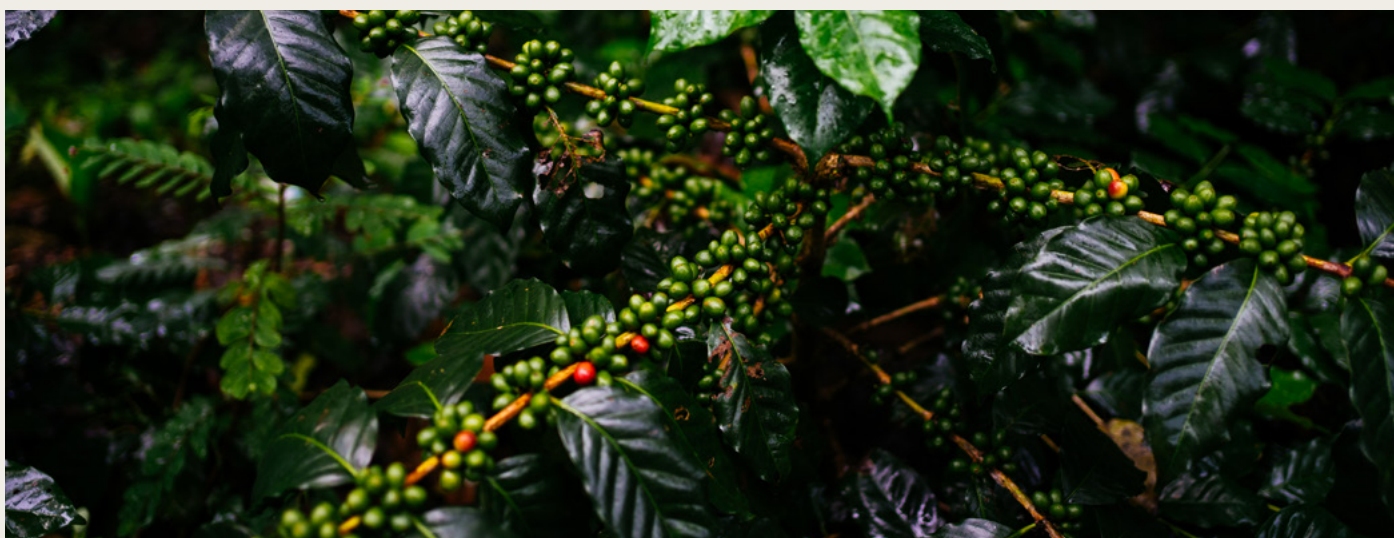
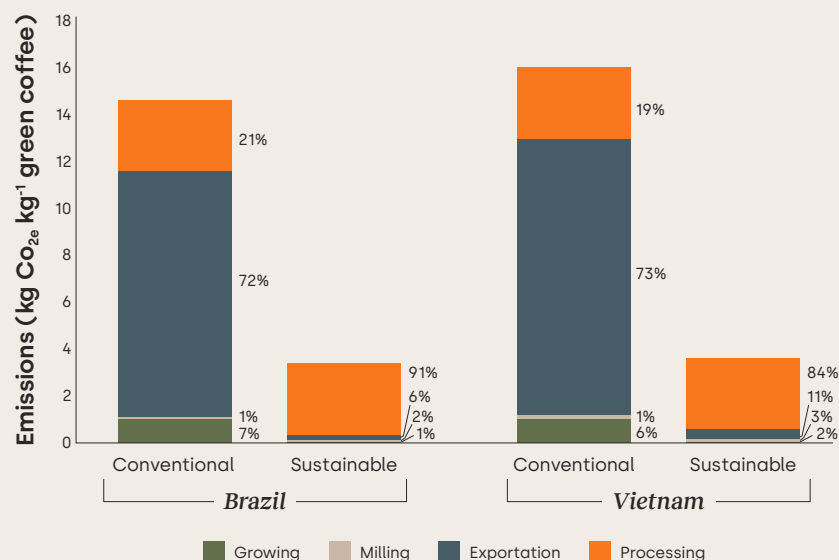
Coffee tree rejuvenation considerations

One reason for low productivity is the aging stock of coffee trees in the country, as the plants tend to produce less coffee over time. Farmers who invest in removing old coffee trees and replanting with new coffee tree seedlings or stump older coffee trees (meaning rejuvenation) could reach yields of three to five kilograms of cherries per tree instead.

Rejuvenating old coffee trees without removing them, with pruning and stumping (cutting main stems) along with good agronomic techniques such as composting, can double or even triple coffee tree yields.²²

This issue has also created a problem for Ethiopia's forests because this low productivity is pushing farmers to expand coffee plantations into forest land. Some farmers perceive the initial investment cost for coffee rejuvenation as too high considering coffee revenues. Even if smallholder farmers were able to cover the upfront cost, they would still need alternative sources of income to cover the loss of coffee revenues over three to four years until the yield gains from the coffee tree renovation or rehabilitation started to kick in.²³

Figure 4: LCA GHG emissions comparison for Brazil and Vietnam, per stage of coffee production²⁵



Soil health

Coffee trees grow on hilly terrain where soil erosion caused by severe wind and droughts threatens production volumes and quality. The growing of eucalyptus for use as firewood has reduced deforestation rates; however, the intensive production of eucalyptus absorbs much of the available soil nutrients, further increasing the pressure on soils and reducing yields from other crops.²⁶ In the medium to long term, intensive eucalyptus production also changes the structure of the soil, deteriorating the nutrient contents and soil moisture, potentially making the area inhospitable to coffee and other crops grown in the traditional garden coffee system.²⁷

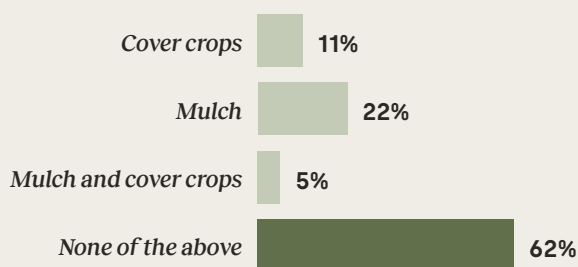
Soil health and adequate nutrient management are key elements of a productive system, with impacts on yields, quality and income. Ethiopia coffee growing areas have seen declining soil fertility due to nutrient leaching over time.²⁸ Nutrients are essential for plant growth and development and soil nutrient ratios play key roles in coffee quality, which in turn dictate the price of coffee.²⁹ The use of synthetic fertilizers does not correlate so far with the soil health situation in Sidama, as an average of 78% of farmers use organic fertilizers, compared to a national average of 27%.³⁰

Biodiversity

Ethiopia is one of the most biodiverse countries in Africa, with more than 6,000 plant species, of which 10% are endemic. Two of the world's biodiversity hotspots are in the country – the Eastern Afromontane and the Horn of Africa. Coffee forests connect to a high level of biodiversity (as biodiversity reservoirs).³² These forests are also key to the genetic diversity of coffee itself – which might become more important for climate-adapted coffee varieties in the near future.

The biodiversity impact of garden and semi-forest coffee production is lower in terms of forest clearing when compared to plantation coffee systems but higher than forest coffee production. For instance, fewer species of insects tend to visit arabica flowers in more intensively managed coffee farms than in natural or semi-natural coffee forests. Nevertheless, studies show that Ethiopian shade-grown coffee may be the most bird-friendly coffee in the world and that semi-forest systems and natural systems are best for large mammals.³³ The trend in the intensification of management practices and the increase in coffee plantations in Ethiopia is a risk for biodiversity.

Figure 5: Soil conservation methods in the Sidama region³¹



Coffee is a crop that grows well in association with other plants, particularly shading species. In Sidama, farmers grow nearly half of the coffee under medium shade levels, which contributes to important environmental services (water and carbon capture, buffer to climate change, high biodiversity carrying capacity).³⁴ Around 73% of Sidama's coffee farming households have diverse shade trees on coffee farms, compared to the national average of 43%.

Pollination is an important input in coffee production. However, climate change has shown to have an impact on pollinators, reducing their activity, along with drought, pests and disease and a shortage of bee forage.³⁵ This risk is likely to increase in the near future as the impact of climate change increases.

As the number of smallholder farmers engaged with garden and semi-forest coffee production is large, the cumulative effect may surpass the impact from plantation coffee production. Recent reports show that increasing both the area of coffee cultivated and production volume in forest landscapes resulted in visible erosion of biodiversity.³⁶

Biodiversity – the variability among living organisms – is a key feature of nature, cutting across all other dimensions. All nature-related impact drivers can contribute directly or indirectly to biodiversity outcomes and, in turn, biodiversity affects the quality of many critical ecosystem services upon which agricultural production relies (such as soil health, bioremediation, etc.). See Annex 1 for further biodiversity screening data on this landscape.

Social issues

Smallholder farmers in Sidama are the stewards of sustainable, nature-positive coffee production. However, without sufficient support, particularly in the face of growing climate challenges, their ability to maintain environmentally sound farming practices is at risk. This not only threatens the livelihoods of these farmers but also the ecological balance and long-term viability of coffee production in the region.

Some 200,000 smallholder farming families, most of whom continue to live in poverty due to small farm sizes and low productivity, produce Sidama coffee – considered among the highest quality in the world. A 2020 TechnoServe study found that coffee farmer income in Sidama was USD \$770 versus a living income benchmark of USD \$1,490.³⁷

Ethiopian coffee is of high intrinsic quality, so differences in export prices typically reflect supply chain issues, including inconsistent harvesting and primary processing methods. Producers receive roughly 60% of the export price, a lower share than in other countries. Although there is considerable potential to improve quality, export prices and supply chain efficiency, it will be difficult to close the living income gap without addressing farm productivity.³⁸ In Sidama, only 15% of coffee farmers have received any technical training, a low proportion but exceeding the smaller national average of 5%.³⁹

Women play a critical role in Ethiopian coffee production, harvesting, and processing, yet often face significant challenges that limit their potential and the overall productivity of the sector. They often handle planting, weeding, and maintaining coffee plants. Their knowledge and labor are crucial for the health and yield of coffee crops. Women are typically responsible for hand-picking coffee cherries during the harvest season. This task is labor-intensive and requires skill to ensure only ripe cherries are selected, which directly affects coffee quality. After harvesting, women frequently manage the initial processing stages, such as washing, sorting, and drying coffee beans. These processes are vital for determining the final quality of the coffee.⁴⁰

Despite being integral to every stage of Ethiopian coffee production, women often have less access to land ownership, credit, training, and agricultural inputs compared to men.⁴¹ This disparity limits their ability to improve farming practices or invest in better technologies. Women are underrepresented in cooperative leadership and decision-making bodies.⁴² As a result, their needs and perspectives are often overlooked in policies and programs related to coffee production. Much of the work women do is unpaid and undervalued, reinforcing gender inequality. Cultural norms may also restrict their ability to participate fully in economic activities.

Studies from Ethiopia have linked poverty with the use of child labor, with estimates indicating that some 8 million rural children aged 5-17 work in agriculture and nearly all of them as unpaid family workers.⁴³ Additionally, a study conducting child labor statistics among Fairtrade coffee households in rural Ethiopia found the systematic underreporting of the work of girls in agricultural settings by the head of household whereas the study found no reporting differences for boys.⁴⁴

In many rural areas in Africa, including Ethiopia, children commonly engage in household chores and family agriculture. Age-appropriate child work may be a valuable, informal and practice-based means of intergenerational knowledge transmission. However, it should not be at the cost of school attendance. Reducing poverty may reduce the problem of child labor and school absenteeism and promote development in the region.⁴⁵

Household and regional vulnerability and poverty have intensified due to land fragmentation and degradation, driven by multiple factors: a population density six times the national average, a warming climate and more extreme weather conditions such as frequent water stress, droughts, floods and unpredictable rains caused by climate variability and change.⁴⁶

Upstream

Upstream environmental impacts are relatively low. Sidama coffee farmers typically use close to no inputs, including pesticides and synthetic fertilizers. Ethiopian coffee is often organic by default and may indeed exceed the standards set for organic certification.⁴⁷ One area of growing interest for coffee production is the recovery of climate-tolerant varieties, a possible development for upstream businesses.

Downstream

There are numerous opportunities to reduce coffee's climate impact along its lengthy supply chains, from lower-emissions ships and trucks in transport, to the use of renewable energy in processing and roasting phases.⁴⁸ Some 40% of GHG emissions from the coffee value chain arise from the production stage, 20% in transport/roasting/packaging and 40% during the consumption and end-of-life stage. However, this can vary considerably according to packaging (instant coffee and capsule versions are more carbon-intensive), brewing method (filter coffee is the least impactful) and final use of product (disposable coffee cups have significant impact). Emissions at the consumption stage are also considerable, related to intensive energy consumption from coffee machines.

Beyond the impacts on climate change with GHG emissions, the other downstream impacts in the coffee value chain connect to packaging and transport, namely the use of resources and waste generated.

Looking ahead

Climate change

The effect of climate change on Ethiopian coffee production is already and will continue to be profound. Research shows that average rainfall across Ethiopia is likely to increase in the near future (2045-2065), with a greater risk of extreme rainfall events (causing soil erosion and flooding) and more unpredictable timing between wet and dry seasons.^{49,50} This change in weather patterns is likely to impact productivity and eventually impinge on the livelihoods that rely on coffee production.

By the end of this century, projections show that the current coffee growing areas of Ethiopia will decrease considerably without the right interventions. Ethiopia could lose from 39% to 59% of its current (although marginal) coffee-growing areas to climate change by the end of the century, according to a new study published in *Nature Plants*. The study concludes that the effects of climate change will be so severe in some of Ethiopia's marginal coffee-growing areas, such as the eastern part of the Sidama region, that they won't be suitable for growing coffee regardless of mitigation efforts.⁵¹

On the other hand, with active migration and intervention, there could be a substantial increase in the coffee farming area of Ethiopia, as areas that were previously unsuitable for coffee will become suitable as the century progresses. This is due to the upslope shift of coffee growing suitability (the niche) as higher altitude areas (for instance above 2,000 meters) improve and lower altitude areas worsen as the climate changes.⁵² The relocation of coffee areas in combination with forest conservation or re-establishment could see at least a four-fold increase in suitable coffee farming area.⁵³

Traceability

The new EU Regulation on Deforestation-free Products (EUDR) includes coffee in its scope, under which companies trading or marketing coffee in EU markets "must be able to prove that the products do not originate from recently deforested land or have contributed to forest degradation."⁵⁴ EUDR compliance would require coffee to be traceable to the farm-gate, which is a challenge for regions like Sidama where local traders don't have the know-how or technology to collect farm geolocation.⁵⁵

Materiality matrixes

Table 2 and Table 3 illustrate the results of the landscape materiality screening conducted, which we intend to be a starting point for refinement by any agri-food company engaged in this landscape and commodity. This generalized assessment only highlights those dependencies and impacts evaluated to have potentially high or very high materiality (according to the methods used in the ENCORE (Exploring Natural Capital Opportunities, Risks and Exposure) tool and the SBTN Sectoral Materiality Tool for Step 1a), with the rationale that these are the most likely to require further risk and opportunity evaluation and to inform the development of priority actions and targets.

Arrows indicate changes in ratings of nature-related dependencies and impacts relative to the ratings in the [TNFD Draft sector guidance – Food and agriculture](#), the ENCORE tool and the SBTN Sectoral Materiality Tool, meaning the major differences to consider at this landscape level compared with a more generalized global screening. The tables align with the classifications available in the ENCORE tool and the *Global Assessment Report on Biodiversity and Ecosystem Services* by the [Intergovernmental Platform on Biodiversity and Ecosystem Services \(IPBES\)](#).



Table 2: Coffee in Sidama – Key dependencies

Value chain stages	Dependencies																			
	Direct physical inputs					Enable production processes					Mitigate direct impacts				Protect from disruption					
	Animal-based energy	Fibers & other materials	Genetic materials	Groundwater	Surface water	Pollination	Soil quality	Ventilation	Water flow maintenance	Water quality	Bio-remediation	Dilution by atmosphere & ecosystems	Filtration	Mediation of sensory impacts	Buffering & attenuation of mass flows	Climate regulation	Disease control	Flood & Storm Protection	Mass stabilization & erosion control	Pest control
Inputs			Plant varieties ↑																	
Small-scale rainfed arable crops			Plant varieties ↑	Needed for washing operations ↑	Needed for washing operations ↑	Essential for crop yield	Essential for crop health & yield		Replenish surface & groundwater		Mitigate pollution from washing operations ↑			Replenish eroded soil & support soil health	Crop health & yield affected by temperatures	Natural crop protection	Natural barriers & root systems			Natural crop protection
Trading & distribution															Operations affected by temperatures					
Processing & manufacturing																				
Retail																				

High materiality

Very high materiality

↑ ↓
Rating difference vs. TNFD Draft Sector-Guidance Food & agriculture; SBTN Sectoral Materiality Tool; ENCORE

Table 3: Coffee & Sidama – Key impacts

Value chain stages	Impacts											
	Land-/water-/sea-use change			Resource exploitation		Climate change	Pollution				Invasive species & others	
	Terrestrial ecosystem use	Freshwater ecosystem use	Marine ecosystem use	Water use	Other resource use	GHG emissions	Non-GHG air pollutants	Water pollutants	Soil pollutants	Solid waste	Disturbance	Biological alterations/interferences
Inputs												
Small-scale rainfed arable crops	Land-use change & soil loss			Wet mills ↑				Organic waste runoff ↑				
Trading & distribution	Land clearing for transport infrastructure		Ocean transport			Fuel use in transport	Fuel use in transport					
Processing & manufacturing				Industrial processes & in products	Packaging ↑	Industrial processes	Industrial processes			Industrial processes		
Retail						Distribution & waste						

High materiality

Very high materiality

↑ ↓ Rating difference vs. TNFD Draft Sector-Guidance Food & agriculture; SBTN Sectoral Materiality Tool; ENCORE

→ **Note that the materiality assessment for this system shows relatively lower impacts compared to other landscapes assessed.** However, the greater potential for impact lies in growing pressures from climate change and market forces, meaning current issues that have the potential to increase impacts from this system in the future if not mitigated appropriately.

Stage 1.3 Assess risks & opportunities

Agri-food companies should next assess nature-related risks and opportunities for the business and for key stakeholders to prioritize further action. The process outlined in the [row crops summary](#) will be relevant for any agri-food company assessing its nature-related risks and opportunities; the summary also contains corresponding findings applicable across global agricultural commodities. The findings here will be relevant for those engaged directly or indirectly in coffee production in Sidama.

Given the material issues linked to water quality, farmer livelihoods and the impact of climate change, the main risks and opportunities for agrifood companies involved in this landscape also revolve around these primary drivers of nature pressure.

Physical risks

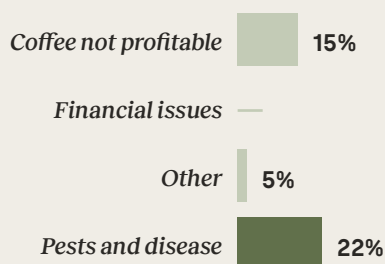
Out of 124 existing coffee species, production relies on just two for 99% of global coffee consumption: arabica and robusta (making up 56% and 43% of global production, respectively). Species-specific threats greatly expose coffee supply chains. Arabica, the only species grown in Ethiopia, is vulnerable to increasing global temperatures and diseases. A 2021 TechnoServe farm survey found that coffee berry disease (CBD) affects 12% of Sidama coffee plants and coffee leaf rust 3%. Both CBD and coffee leaf rust spreads from tree to tree and from farm to farm through coffee pickers, birds or infected seedlings. While they do not kill trees, both diseases can be responsible for considerable yield losses and their incidence increase correlates with escalating climatic variables. In Ethiopia, CBD has been responsible for average yield losses between 24% and 30%.⁵⁶

Transition risks

As for many agri-food value chains, transition risks may include lost revenue, profitability or financing if customers, consumers or lenders move away from producers or if the perception is that entire regions are unsustainable or unethical (meaning with regard to farmer incomes and supply chain labor issues). This can also put at risk a company's legal or community license to operate.

Physical and transition risks can cascade from agri-producers to both downstream and upstream actors, including supply disruption, increased supply chain costs, lost business and depreciated or stranded physical assets such as land holdings and processing facilities.

Figure 6: Reasons for abandoning some portion of the coffee plot in the surveyed year (percentage of coffee farming households)⁵⁷



The EUDR poses a potentially serious challenge to sustainable coffee production in Sidama and Ethiopia as a whole. There is a risk of downstream companies exiting the market due to the difficulty of proving EUDR compliance from this region – including traceability to origin. Most smallholders lack the expertise and resources to collect the data required for EUDR compliance. One single shipment of coffee can include beans from thousands of farmers,⁵⁸ making Ethiopian coffee “risky” in the eyes of buyers. Early indications are that European companies may shift their sourcing to countries with better traceability and compliance systems. This may mean Ethiopian farmers will lose access to markets, resulting in reduced incomes, greater socioeconomic instability and less incentive to maintain traditional sustainable coffee farming practices. Some public and private sector efforts are underway to address EUDR compliance gaps but these are not yet ready (see [public policy](#) section).

Water pollution from local coffee processing currently poses the most significant direct environmental impact within the system. If left unaddressed, it could escalate into a serious transition risk, especially as downstream stakeholders increasingly scrutinize both environmental and social practices.

Business opportunities include:

- avoiding these risks through careful planning and investment in the development of premium markets (meaning for high-quality forest coffee)
- increased revenue, profitability and financing options through improved practices and with the use of high-quality, climate-resilient varieties and
- supporting farmers in becoming compliant with regulatory requirements (such as custom traceability systems designed for smallholders).

Government programs can help catalyze public-private collaboration to accelerate and scale these opportunities.

Figure 7: Interconnections between key dependencies and impacts related to one key impact area – wastewater discharge – in conventional coffee production in Sidama and the resulting risks for farmers and agri-food companies

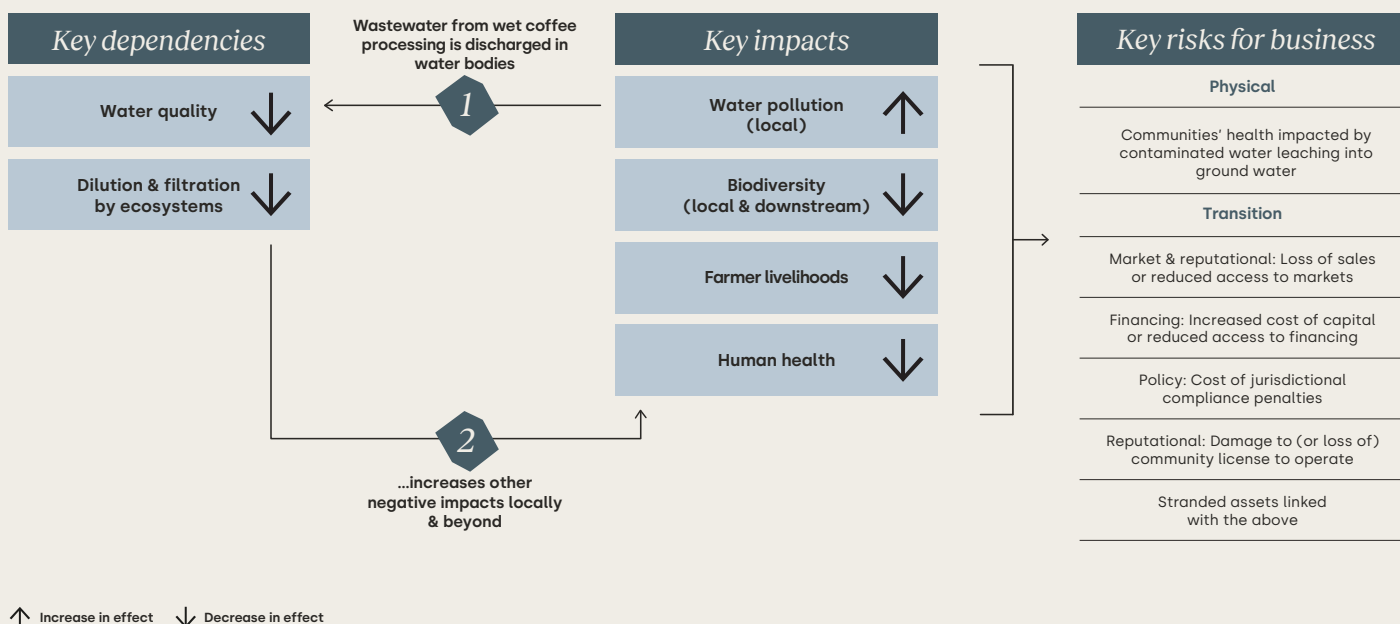
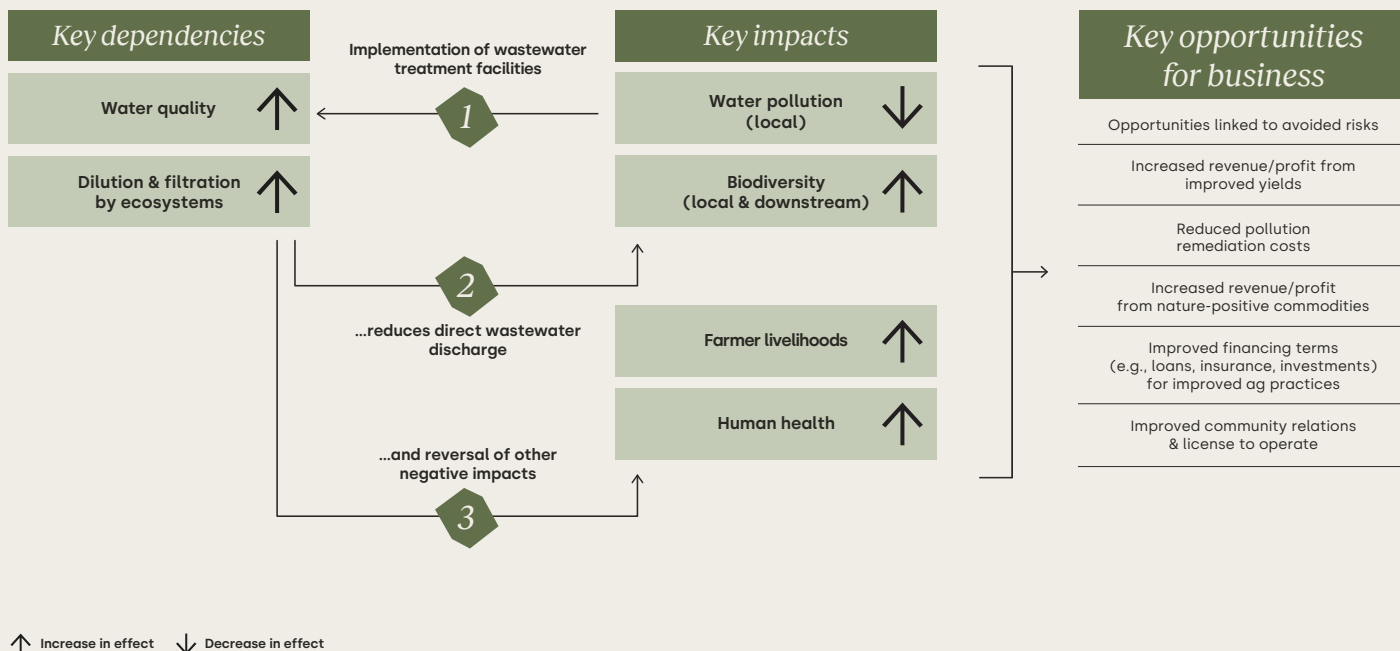


Figure 8: Interconnections between key dependencies and impacts in a more nature-positive coffee production system and the resulting opportunities for farmers and agri-food companies



Stage 2: *Commit and transform (targets for priority actions)*



02.

Stage 2: *Commit and transform (targets for priority actions)*

Stages 2.1 & 2.2 Set science-informed targets and take priority actions

Based on the materiality screening, agri-food companies should identify the existing and additional priority actions needed to avoid and reduce negative impacts and promote opportunities to restore and regenerate nature.

Companies should set time-bound, specific, science-informed corporate-level targets and linked indicators to track progress on reducing the priority impact drivers on nature.

Improve agricultural & processing practices

Agri-food companies linked to the Sidama landscape should partner with stakeholders in government and civil society to address the most critical impacts of coffee production and to help farmers adapt to changing conditions threatening the ecosystem services upon which they depend.

To reduce the main environmental impact of coffee production in Sidama – intensive water use and discharge of polluting wastewater from wet mill processing – will require improved equipment and training to reduce pollution and increase water-use efficiency. Solutions include eco-pulpers, which use less water than conventional pulpers, and closed-circuit systems that can recycle water used during the de-pulping process and reuse it for washing.

Other low-cost technologies – such as Nature-based Solutions (NbS) – include vetiver filtration technology. This innovation is a cost-effective, environmentally-sound alternative to more expensive conventional filtration options, such as percolator wells and sedimentation wells. This system uses vetiver grass planted downhill from coffee washing stations, forming wetlands that absorb most of the contaminated wastewater and ponds take any excess water that the vetiver cannot absorb, rather than flowing into rivers.⁵⁹

Mixing coffee pulp (the main solid waste by-product generated by the coffee processing station) in the composting pile with organic elements like farmyard manure and leguminous plants can generate nutritionally high-quality compost in around 45 days. Using decomposed coffee pulp compost is superior in terms of increasing coffee yield compared to the current compost mix used by Ethiopian farmers.⁶⁰ Farmers need training on the development and use of these by-products to both reduce environmental pollution and increase coffee yields.

Spotlight on TechnoServe and Mother Parkers Tea & Coffee

TechnoServe partnered with Mother Parkers Tea & Coffee to protect Sidama's rivers and improve the lives of its communities through the **Water Wise Coffee project**. The initiative works with over 100 wet mill owners to implement an innovative water management system that reduces the contamination of local rivers by separating the coffee pulp from the wastewater. The project composts the separated pulp and then distributes it to farmers as organic fertilizer. Meanwhile, Water Wise installed vetiver grass to absorb the remaining wastewater from wetlands.

Water sampling downriver from wet mill sites revealed that the Water Wise approach prevented pollution: all pollution indicators decreased by 50% or more, with pH increasing from acidic (pH 5.7) to neutral (pH 6.9) and dissolved oxygen increasing by 84%.

To improve the region's typically low coffee yields in the face of accelerating climate-driven risks, companies and partners should invest in:

- Training farmers on appropriate coffee renovation and rehabilitation/rejuvenation techniques
- Supporting access to the right tools, such as saws and secateurs, through direct financial assistance, the implementation of tool sharing schemes or other solutions
- Increasing local climate change adaptation and resilience by investing in the research and development of drought-tolerant coffee species and improving access to seedlings
- Providing farmers with financial and technical support to enable the switch to full agroforestry for multiple cash crops, thus increasing local biodiversity and protecting critical ecosystem services
- Supporting farmers as they integrate beekeeping (apiculture) into their production to increase pollination, enhance biodiversity and further diversify income

Landscapes & restoration

Taking a landscape approach reflects an understanding of farms as an active part of local ecosystems, communities and cultures, recognizing they both rely on critical ecosystem services and create impacts beyond the farm boundary. Agri-food companies should embed landscape approaches as a guiding theme in their nature-positive strategies – including investing in landscape protection and restoration projects in and beyond their value chains, with a particular focus on areas of high conservation value. Looking beyond the farm gate, local landscapes can benefit from reforestation initiatives to control soil erosion and enhance biodiversity (which can help maintain biological pest control for coffee production).

Stage 2.3 Transform the system

Agri-food companies should identify the additional actions needed to transform business models and business activities. These actions should address barriers and improve the enabling environment (policy, financing, technology, infrastructure).

Companies should consider both direct operations and their wider sphere of influence (such as priority upstream and downstream value chains and landscape-specific stakeholders and customers).

Business strategy, market development & financing

It is especially critical in smallholder systems for farmers to receive adequate compensation for sustainable practices, otherwise there can be no guarantee that these practices (and the associated maintenance of key ecosystem services) will continue. Although the financial and labor burden of aligning with certification standards such as FairTrade falls on farmers, studies show that coffee farmers typically receive only about one-sixth of the price premium paid by the consumer, if there is a price premium at all.⁶¹ Multiple existing mechanisms exist to do so, as outlined below.

Financing farmer training and incentives

Coffee companies can finance farmer training and incentives through several innovative and sustainable approaches. These methods ensure that both the companies and the farmers benefit from improved practices and better-quality coffee, leading to higher profits and a more sustainable coffee supply chain. When using direct funding, coffee companies allocate a portion of their profits or operational budgets directly to farmer training programs. This can include workshops, on-farm demonstrations and the development of training materials.

Another mechanism is pre-financing, where companies provide upfront payments or loans to cooperatives or farmers before the harvest season. This capital can be used for training programs or to adopt better farming practices. The loans are typically repaid after the harvest, often through the sale of coffee beans to the company.

TechnoServe's living income analysis has shown that the most impactful intervention companies can implement to increase farmer income is financing training and incentives to improve the productivity of coffee trees.⁶² Higher coffee tree productivity will increase farm income dramatically (up to three-fold). Companies can also offer training and technical assistance to farmers and cooperatives, helping them to improve farming practices, processing techniques and business management skills.



Women are integral to every stage of Ethiopian coffee production, from planting to processing. True progress in Ethiopia's coffee sector cannot be achieved without addressing gender disparities. Empowering women ensures that all members of the farming community contribute fully to the industry's growth. Empowering women through education, access to resources and leadership opportunities can lead to better farming practices, higher coffee quality and increased productivity.

Building capacity of Ethiopian farmer cooperatives

Cooperatives in Ethiopia have the potential to significantly enhance the country's coffee sector by improving quality management and engaging in local processing. Coffee companies can invest in cooperative-led processing facilities, providing the capital needed to build and maintain quality control labs, processing stations, and other essential infrastructure. Companies can offer training and technical assistance to cooperatives, helping them to improve farming practices, processing techniques and business management skills. This support ensures that cooperatives can consistently produce high-quality coffee. Coffee companies can help cooperatives access international markets by integrating them into their supply chains. This collaboration can also involve co-branding efforts that highlight the unique qualities of Ethiopian coffee, creating a win-win situation where both cooperatives and companies benefit from higher market prices.

Coffee companies can support this transformation by investing in infrastructure, providing training, facilitating market access, and forming long-term partnerships. This collaboration can lead to a more sustainable, profitable and equitable coffee industry in Ethiopia.

Establishing long-term partnerships with cooperatives can provide stability and security for smallholder farmers. These partnerships can include agreements on fair pricing, investment in sustainability initiatives and collaborative efforts to improve the overall quality of the coffee produced. Such collaboration can lead to a more sustainable, profitable and equitable coffee industry in Ethiopia.

Increase commitment to certified coffee

In the last decade, voluntary standards (such as [4C](#), [Rainforest Alliance](#), [FairTrade](#)) and second-party sourcing programs led by traders (such as [JDE Peets](#), [LDC](#), [Nespresso](#) and many others) have been successful in increasing the volume of certified coffee at the farm level. During the 2020-2022 period, global coffee production saw approximately 55% certification but this figure does not account for cases of multiple verifications or certifications.

However, the industry's ability to absorb the total volume of certified coffee constrains the direct benefits to farmers, such as price premiums and access to new markets. This is a critical issue, as in 2021, purchasers bought less than 26% of coffee as "standard-compliant" coffee, meaning that companies marketed the other 74% of the sustainable coffee available as conventional coffee. Consequently, certified producers, who have made upfront investments to comply with standards, face reduced profitability. This situation diminishes their financial capacity and undermines their motivation to invest in continuous improvement practices.⁶³

Develop premium markets for high-quality, sustainable coffees

Favorable coffee market opportunities incentivize smallholders to continue growing sustainable coffee instead of converting to ecologically harmful monocrops like khat. Research has found that, due to a coffee price increase from USD \$0.40/kg to USD \$0.93/kg in 2019-2020, replanting coffee and orchard fruits motivated smallholders.⁶⁴ Additionally, Sidama's indigenous knowledge and land management practices can be highlighted in the marketing and branding of Sidama coffee. This approach not only adds value to the coffee in global markets but also helps preserve the cultural heritage of the Sidama people.

Implement living income & improve contractual policies

Living income is gaining traction as part of the sector's sustainability agenda, with increasing support from many actors in the coffee industry. A network of organizations and initiatives has emerged: platforms such as the [Global Coffee Platform](#) (GCP), the [Sustainable Coffee Challenge](#) (SCC) and the International Coffee Organization's [Coffee Public Private Task Force](#) (CPPTF) have placed living income as a top priority.⁶⁵

Building longer-term buying relationships with producers, which can provide some stability and lower risks and offer long-term contracts that include price risk management tools, can benefit producers.

Traceability

Sourcing practices that can help close the gap in living incomes and wages and traceability in the supply chain are a critical prerequisite for most other sustainability interventions for a living income and living wages. Therefore, companies should ensure sufficient traceability in their entire coffee supply chains.⁶⁶ To support greater traceability over time, companies can invest in digital platforms that deliver training content via mobile phones, making it accessible to more farmers. These platforms can also be used to distribute incentives or track progress, making the process more efficient and transparent.

Financing

The lack of agricultural credit and rural financial services are a systemic constraint for rural transformation in Ethiopia. The government is under growing pressure to increase funding for agriculture and meet the needs of smallholders. However, public finance alone will not be sufficient to close funding shortfalls and strengthen the coffee sector. Likewise, it is not possible to close financing and investment gaps to advance coffee renovation and rehabilitation through a solely commercial approach in the short and medium term because financial institutions and smallholder farmers perceive them as too risky or costly.

Spotlight on the multistakeholder partnership between the Ethiopian Coffee & Tea Authority (ECTA), JDE Peet's and Enveritas

In February 2024, ECTA, JDE Peet's and Enveritas **announced** an agreement to implement a scheme enabling Enveritas to verify that the source of Ethiopian coffee is not land deforested after 2020, as mandated by the new European Union Deforestation Regulation (EUDR). This agreement will prompt Ethiopia to eliminate non-compliant coffee. Following this, JDE Peet's will assist farmers in reforesting the affected areas. This innovative, inclusive solution, developed by JDE Peet's and Enveritas and supported by the EU's declaration-in-excess concept, will enable large-scale assessments to ensure coffee-producing lands are deforestation-free, advancing climate goals while safeguarding smallholder farmers.

Using the Enveritas advanced territorial approach, which combines high-resolution satellite imagery, machine learning and on-the-ground teams, this nascent program has high potential to support ECTA in certifying its entire coffee production area as deforestation-free in accordance with the regulation's definitions.

Public policy

Public policy must underpin the agri-food system's nature-positive transformation at the global, national, regional and local levels. Domestic policy plays a critical role in transforming the coffee production system in Ethiopia, especially given the smallholder-dominated landscape where ecological sustainability closely intertwines with human wellbeing and livelihoods.

In January 2024, the Government of Ethiopia, in partnership with the United Nations Development Programme (UNDP) and with the support of the Global Environment Facility (GEF), jointly launched a major project to tackle deforestation, promote forest restoration and integrate sustainability into the country's coffee value chains and food systems.⁶⁷ The "Preventing Forest Loss, Promoting Restoration and Integrating Sustainability into Ethiopia's Coffee Value Chains & Food Systems" project will run from 2023-2031, with a total budget of over USD \$20 million. It aims to adopt the National Integrated Land Use Policy and the partners expect it to have a significant impact: avoiding 7,288,195 tons of CO₂-equivalent emissions, improving livelihoods for 440,000 people (50% women), restoring 10,500 hectares of unproductive coffee gardens, restoring and managing 60,000 hectares of dry and moist Afromontane Forest and bringing 2,031,502 hectares of land under improved land use practices.⁶⁸

Spotlight on the Food and Land Use Coalition (FOLU) in Ethiopia

FOLU Ethiopia is supporting the Ethiopian Coffee and Tea Authority (ECTA) to establish the Ethiopian Coffee Renovation Fund (ECRF). FOLU Ethiopia and ECTA have designed the fund to systematically direct resources to smallholder coffee farmers for the renewal and rejuvenation of their coffee trees. The ECRF will help pull resources from different sources in a market-based and sustainable manner to provide financing and incentivize farmers to boost productivity, improve livelihoods and enhance the ecological balance of the coffee sector. It will support farmers through technical assistance and it will build the capacity of Ethiopia's coffee sector and financial ecosystem for improved outcomes for nature and farmers.

Other innovative finance facilities have also started emerging to support aggregators, off-takers and buyers of specialty coffee to protect at-risk value chains and to safeguard the incomes of forest-dependent communities. One example of such a scheme is the **Rebuild Facility**, a finance facility of Regeneration that supports sustainable cocoa and coffee businesses in Ethiopia, Uganda and Kenya. The capital – offered as a returnable grant – facilitates the continued purchase of sustainable commodities from smallholder farmers, cooperatives and community-based enterprises. As they successfully sell the commodities to end-markets, the grant goes back to the Rebuild Facility, which redistributes it to strengthen sustainable and fair value chains. The grant eligibility criteria include evidence of regenerative or zero-deforestation practices embedded in the business model and the ability to show traceability in the value chain.



Maturity progression: nature-positive coffee production in Sidama

WBCSD's [foundations guidance](#) includes the core concept of a corporate nature maturity progression, from starting to developing, advancing and ultimately leading. The general progression, aligned with the [SBTN Action Framework](#), is from "do no harm" to "do more

good" to "transform the system". A set of criteria aligned with the [High-level Business Actions on Nature](#) defines each stage. The intent is to meet companies where they are today and support their advancement toward leading practices.

The following progression illustrates the highest priority issue in catalyzing nature-positive system transformation in this landscape: increasing the socioeconomic returns of nature-positive coffee production.

Table 3: Illustrative corporate maturity progression on socioeconomic returns for coffee in Sidama, Ethiopia

	Corporate nature maturity levels		
	Starting (Do no harm)	Developing/advancing (Do more good)	Leading (Transform the system)
Policy & stakeholder engagement	<p>Comply with all jurisdictional regulations</p> <p>Avoid using multiple certification schemes that can lead to complex and expensive pressure on producers (not always higher income)</p>	<p>Invest in local production systems to support farmers with value-added activities and better environmental and economic practices, as well as other finance mechanisms, such as grant schemes</p> <p>Develop the whole value chain locally, integrating higher value-added activities in the region, providing capacity building, opportunities and income</p>	<p>Lead pre-competitive coordination, civil society partnerships, trade associations & policy advocacy to catalyze food system transformation</p> <p>Develop multi-stakeholder funds to support the transition from old trees to crop rejuvenation without producers suffering financial losses</p> <p>Secure market access to the EU and other export regions for local communities to ensure they are not excluded due to cost of compliance with regulations and/or certification schemes</p> <p>Develop transparency on profit sharing and better revenue allocation to support living incomes and better life quality in producing regions</p>
Business strategy	<p>Support farmers in avoiding the use of unnecessary synthetic inputs</p> <p>Support farmers in avoiding the need to replace coffee with higher environmental impact crops (e.g., khat, eucalyptus, maize)</p>	<p>Pay certified farmers premium values so that sellers don't sell certified coffee as conventional coffee</p> <p>Offer technical and financial support to cooperatives to improve wet mill water treatment methods</p> <p>Offer high-quality technical and financial assistance to small-scale agroforestry/garden systems</p> <p>Employ precision agriculture methods for inputs, when required</p> <p>Incentivize crop rejuvenation (stumping) via financial compensation</p> <p>Develop climate change-resilient varieties</p> <p>Reintroduce forgotten wild coffee species (drought-tolerant) to incentivize climate-proof coffee</p> <p>Support shaded crop practices or agroforestry to support farming resilience and diversity</p> <p>Increase biodiversity on farms</p>	<p>Develop premium markets for high-quality sustainable coffees</p> <p>Improve smallholder producers' access to traceability technology access and adoption</p> <p>Deliver technical support to farmers for agroecological growing and the 4R principle</p> <p>Advance integrated landscape management systems that consider farmer livelihoods, food security and crop rejuvenation</p> <p>Implement living income policies for farmers and ensure annual data collection and assessment against commitments</p>
Illustrative commitments	<p>Implement replanting or renovation to ensure some presence young or middle age (≤ 8 years) trees in plot</p> <p>Select coffee variety based on quality, productivity and rust resistance; some use of rust resistant varieties</p>	<p>Implement replanting or renovation to ensure at least 40% of plot has young or middle age (≤ 8 years) trees</p> <p>Select coffee variety based on quality, productivity and rust resistance; use rust-resistant varieties on $>35\%$ of plot</p> <p>Maintain agroforestry cover, including a diversity of trees on the overall farm, with at least 4 species (ideally native).</p> <p>Commit to treating wastewater from coffee processing so that it meets Rainforest Alliance water-quality parameters and reduce total water use during irrigation</p> <p>Monitor the % of farming households with a living income</p>	<p>Implement replanting or renovation to ensure at least 50% of plot has young or middle age (≤ 8 years) trees</p> <p>Select coffee variety based on quality, productivity and rust resistance; use rust-resistant varieties on $>50\%$ of plot</p> <p>Maintain agroforestry cover, including a diversity of trees on the overall farm, with at least 6 species (ideally native) and including species with the potential for income diversification, nitrogen fixing, pollination, pest control or other ecosystem services.</p> <p>Commit to 50% of farmers receiving the Living Income Reference Price (cost of decent living + cost of sustainable production/viable land area \times sustainable yields) (FairTrade)</p> <p>Engage 50% of Sidama growers in technical training on climate adaptation by 2025 and 80% by 2027</p>
Key references	<p>Coffee and Farmer Equity (C.A.F.E.) Practices (Starbucks)</p> <p>The Coffee Guide, Fourth Edition (International Trade Centre - ITC)</p>	<p>Ethiopia Pilot Tools for Stumping Program (TechnoServe)</p> <p>Coffee Barometer (Ethos Agriculture)</p> <p>Regenerative Coffee Scorecard (Rainforest Alliance)</p>	<p>Preventing forest loss, promoting restoration, and integrating sustainability into coffee value chains and the food system (UNDP, GEF)</p> <p>Action Agenda for a New Food and Land Use Economy in Ethiopia (FOLU)</p> <p>Coffee Barometer (Ethos Agriculture)</p> <p>FairTrade Living Income Strategy (FairTrade International)</p>

Key trade-offs & remaining barriers

EUDR

While acknowledging the efforts to formulate the National Action Plan for EUDR compliance measures, the EU has shown a willingness to assist Ethiopia in overcoming potential implementation challenges. This support will be critical to reducing the unintended negative consequences of the EUDR in the region, though the details as to how the EU will bridge the gap in data availability, comparability, traceability, measuring, reporting and verification are still unclear.

Efficacy of certifications in protecting ecosystems

In the case of Ethiopian forest coffee, studies have found that higher prices paid to producers for certified coffee may provide an unintended incentive for farmers to intensify their coffee production by slashing undergrowth and cutting down larger trees, in a version of the so-called “rebound effect”.⁶⁹ Certifying landscapes rather than just the coffee or coffee cooperatives may be more effective as farmers using sustainable forest management and related environmental services can receive a price premium as their reward.⁷⁰

Cost of renewing stock of aged coffee trees

Despite the huge yield difference and other benefits of renovating or rehabilitating coffee farms, smallholder farmers have been reluctant to make these investments. This is due to high upfront costs and the need to bridge the loss of coffee revenue until the yield gains from the coffee tree renovation or rehabilitation start to kick in. Although work is in progress (both at a national level and through multi-stakeholder partnerships) to tackle this barrier, the rejuvenation will take several years to have a positive effect on yield and, by extension, rural livelihoods.

Climate-driven changes in regional growing patterns

Climate change will negatively impact much of the current coffee farming landscape of Ethiopia. However, substantial areas that were previously unsuitable for coffee will become suitable as the century progresses. Assisted migration to “new” areas will be a key component in ensuring resilience in the Ethiopian coffee economy due to the replacement of areas lost at lower altitudes as the climate there becomes unsuitable for coffee growing.⁷¹ The relocation of coffee farms to higher altitudes will require critical attention to socioeconomic and environmental impacts and financial support to smallholder farmers for establishment costs.

Spotlight on PUR x Nespresso’s Agroforestry Program

Ethiopia has become severely deforested due to the need for fuelwood for a growing population, the lack of expertise in managing regional forests and the rapid expansion of planted eucalyptus trees — leading to water depletion, soil fertility loss and significant erosion accentuated by more frequent drought episodes.

In 2015, PUR (a nature-based solutions implementation company) launched the **Nespresso Agroforestry Program** in the Sidama region to increase the resilience of coffee parcels to climate change, providing technical assistance and diversifying income with fruit trees to support self-sufficiency.

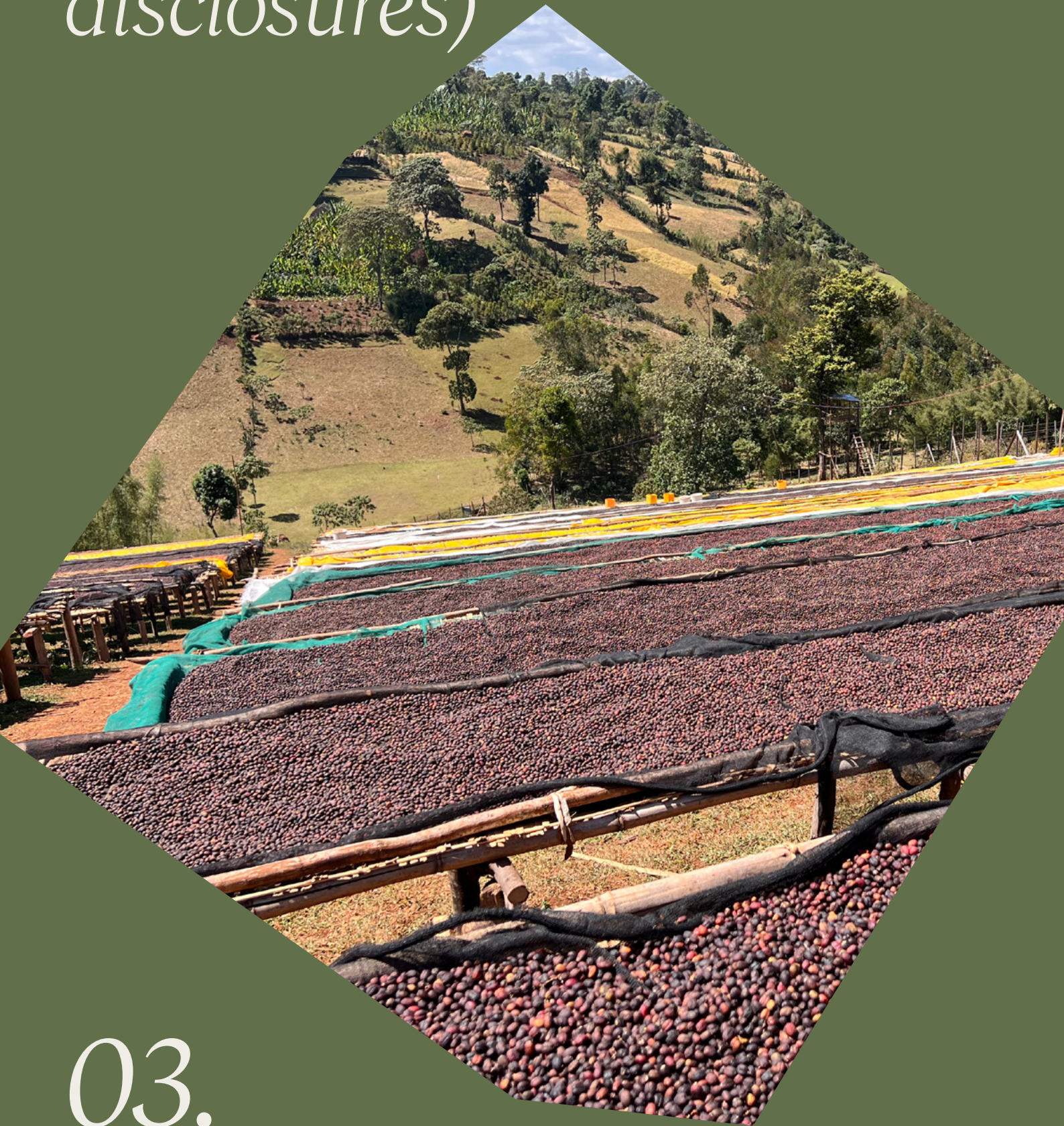
The project did not stop at the farmer’s gate, as it also worked to reforest the emblematic local Rako mountain. Once covered with lush forest, the slopes of the local Rako Mountain face exposure to successive deforestation for timber, agriculture and animal husbandry. Bare lands are seriously degraded, with impoverished soils threatened by erosion. Local farmers suffered from landslides during the rainy season, destroying coffee plots and even farmers’ homes. This beyond-farm gate initiative supports small-scale coffee farmers in their fight against land erosion and extreme climatic events such as droughts, heavy rains and higher temperatures.

In 2020, Nespresso reported significant impacts from the project:

- 3,367 farmers benefitting
- 568 hectares restored
- 496,818 individual trees planted from 12 species
- 95,900 metric tons CO2e it expects to sequester



Stage 3: *Disclose (initial disclosures)*



03.

Stage 3: *Disclose (initial disclosures)*

Initial disclosures can build on existing nature-related reporting practices and may include the methodologies and outputs of a company's materiality assessment, value chain mapping, interim target-setting and progress on actions.

As a company's nature journey matures, disclosure ambitions and granularity should increase.

For companies linked to Sidama coffee production, nature-related disclosures may be necessary to meet legal standards such as the EUDR through annual corporate sustainability reporting and as part of voluntary certification schemes such as [4C](#), [Rainforest Alliance](#) or [FairTrade](#).

The [TNFD's sector-specific guidance](#) for the food and agriculture sector (which covers the SASB industry standards for non-alcoholic beverages industry) provides a framework, process and recommended metrics for corporate disclosure that are relevant for this landscape and align with other leading voluntary frameworks, such as [CDP](#), the European [Corporate Sustainability Reporting Directive](#) (CSRD), the [Global Reporting Initiative](#) (GRI) and the IFRS [International Sustainability Standards Board](#) (ISSB). The [SBTN High Impact Commodity List](#) is also instructive in this process.

In general, corporate reporting should include the value chain and landscape-specific assessments demonstrated in this deep dive, including acknowledgement of existing gaps and barriers as we outline in the previous section. The aim should not be perfection or full value chain data coverage but rather a materiality-led approach with transparency about the process, findings and progress. The key questions to consider may include:

- What are stakeholders (financial and other) actually looking for?
- What is in the company's control to manage and measure?
- What falls in its broader spheres of influence?

Sticking closely to leading consensus-driven disclosure frameworks will help ensure a transparent and credible approach.



Annexes

Annex 1: Landscape profile

Key considerations for the **Scoping** and **Locate** steps of corporate value chain nature assessment, as recommended in the locate, evaluate, assess and prepare (LEAP) approach from the Taskforce on Nature-related Financial Disclosures (TNFD) – including sector and subsector identification according to the Sustainability Accounting Standards Board (SASB) **Sustainable Industry**

Classification System (SICS), commodity presence on the Science Based Targets Network (SBTN) **High Impact Commodity List**, relevant biomes, the identification of biodiversity risks, water stress and other considerations. See the **Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) glossary** for definitions of key terms.

Location		Sources
Sidama, Ethiopia		
Geolocation	6,538 km²	
Biomes	Tropical/Subtropical montane rainforests (T1.3) Tropical/Subtropical dry forests and thickets (T1.2) Derived semi-natural pastures and old fields (T7.5) Permanent upland streams (F1.1)	<i>TNFD guidance</i> <i>Global Ecosystems Typology tool</i>
Biodiversity overall risk	Medium	<i>WWF Risk Filter</i>
Biodiversity hotspot?	Yes	<i>Critical Ecosystem Partnership Fund (CEPF)</i>
Includes key biodiversity areas (KBAs)?	Yes	<i>WWF Risk Filter</i>
High water stress?	Medium/high	<i>World Resources Institute (WRI) Aqueduct</i>

Commodity cycle		Sources
Coffee		
SICS sector	Food & beverage	
SICS industries – upstream	<i>Insurance, commercial banks</i>	SASB
SICS industries – direct operations	Non-alcoholic beverages	
SICS industries – downstream	Manufacture of other food products – Production of coffee and coffee substitutes Transportation – rail, road, marine Food retailers & distributors	
High-impact commodity list?	Yes	SBTN

Note: Sectors in italics could be relevant but we did not assess them as unique to this deep dive.

Annex 2: Further reading

Climate-Smart Coffee: This guidance explores the concept of climate-smart coffee, whereby climate resilience and productivity increase while greenhouse gas emissions simultaneously reduce.

Coffee Barometer Report: The report shines a light on the current state of sustainability in the global coffee sector. The 2023 report combines publicly available data and provides context to grasp the challenges, commitments and achievements. The Coffee Brew Index allows readers to delve into and comprehend the maturity of sustainability strategies adopted by the 11 leading coffee companies.

ECFF & Kew - Coffee Farming and Climate Change in Ethiopia Impacts, Forecasts, Resilience and Opportunities: This report covers Ethiopia's coffee growing landscape and assesses current and future changes due to climate change and potential adaptation measures.

Enveritas Coffee Map: HereWeGrow and Enveritas have collaborated to provide a dataset and visualization that can help the world understand the nuanced challenges smallholder coffee farmers in Ethiopia face. Enveritas surveyed thousands of smallholder coffee farmers across Ethiopia coffee growing regions in 2021 and 2022 to produce the underlying data that drives these visualizations.

Sustainable Coffee Challenge: This collaborative effort brings together companies, governments, NGOs, research institutions and others in Ethiopia to transition the coffee sector to be fully sustainable. Challenge partners are urgently working together to increase transparency, align on a common vision for sustainability and collaborate to accelerate progress toward those goals.

FOLUR Ethiopia: The Food Systems, Land Use and Restoration (FOLUR) Ethiopia project aims to prevent further forest loss, promote restoration and integrate sustainability into coffee value chains and the food system. By developing integrated landscape management systems, the project will support government processes through a participatory and inclusive approach.

FairTrade Coffee Risk Map: This tool depicts current understanding of the salient human rights and environmental issues in the supply chains and geographies where FairTrade works. It updates the information on this map on a regular basis.

Rainforest Alliance **Regenerative Coffee Scorecard:** This voluntary tool for certified and non-certified supply chains guides farmers through a stepwise pathway from efficient practices to redesigned nature-based farming and its design is easily adaptable for different origins.

WBCSD **Business guidance for deeper regeneration:** Borne from a collaborative effort involving more than 50 members and 27 business-focused partners, representing more than 1,100 businesses – this guidance aims to align farm-, landscape- and global-level metrics with corporate reporting and to influence accounting, reporting and disclosure bodies to develop specific guidance for regenerative agriculture.

Acronyms and abbreviations

CBD	coffee berry disease
CPPTF	<u>Coffee Public Private Task Force</u>
CSRD	<u>EU Corporate Sustainability Reporting Directive</u>
DIRO	dependencies, impacts, risks and opportunities
ECRF	Ethiopian Coffee Renovation Fund
ENCORE	<u>Exploring Natural Capital Opportunities, Risks and Exposure</u>
ECTA	Ethiopian Coffee and Tea Authority
EUDR	<u>European Union Deforestation Regulation</u>
FOLU	<u>Food and Land Use Coalition</u>
FOLUR	<u>food systems, land use and restoration</u>
GHG	greenhouse gas
GCP	<u>Global Coffee Platform</u>
GEF	<u>Global Environment Facility</u>
GRI	<u>Global Reporting Initiative</u>
HCV	High conservation value
ISSB	<u>International Sustainability Standards Board</u>
IPBES	<u>Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services</u>
KBA	<u>key biodiversity area</u>
LCA	life cycle assessment
LEAP	<u>Locate, Evaluate, Assess, Prepare approach</u> of the TNFD
MRV	monitoring, reporting & verification
NbS	nature-based solutions
PES	payment for ecosystem services
SASB	<u>Sustainability Accounting Standards Board</u> , now part of the <u>International Financial Reporting Standards (IFRS) Foundation</u>
SBTN	<u>Science Based Targets Network</u>
SCC	<u>Sustainable Coffee Challenge</u>
SCFCU	Sidama Coffee Farmers' Cooperative Union
SICS	<u>SASB Sustainable Industry Classification System</u>
SOC	soil organic carbon
TNFD	<u>Taskforce on Nature-related Financial Disclosures</u>
UNDP	<u>United Nations Development Programme</u>

Endnotes

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The World Business Council for Sustainable Development (WBCSD) is a global community of over 225 of the world's leading businesses driving systems transformation for a better world in which 9+ billion people can live well, within planetary boundaries, by mid-century. Together, we transform the systems we work in to limit the impact of the climate crisis, restore nature and tackle inequality.

We accelerate value chain transformation across key sectors and reshape the financial system to reward sustainable leadership and action through a lower cost of capital. Through the exchange of best practices, improving performance, accessing education, forming partnerships, and shaping the policy agenda, we drive progress in businesses and sharpen the accountability of their performance.

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