



12TREE SUSTAINABILITY REPORT
JULY 2022



"We strive to be the agent enabling investments in scalable, profitable Nature Based Solutions while generating measurable social and environmental transformation. As a central element of this transformation, we create strategic offtake agreements that de-risk, de-commoditize and ultimately reward sustainable food supply chains and help to meet net-zero commitments of our clients."

*Richard Focken
CEO of 12Tree*

A message from our CEO



“Dear reader,

The urgency of climate change mitigation and adaptation has finally gained more ground internationally, both in the investment community and also amongst big corporates.

There seems to have been a serious awakening and a willingness to act, especially amongst the key players in the food and agriculture industry, as the current food system is directly and indirectly responsible for about a quarter of all global greenhouse gas (GHG) emissions. There is also a much greater appetite for pricing-in the key externalities of carbon pollution. In other words, the investor community is starting to believe in the potential of the carbon market for offsetting emissions, whilst corporates are starting to take on the challenge of reducing emissions within their value chains (insetting) and offsetting emissions where they can't.

The current public discussion about climate change mitigation is mainly a quantitative one: how many tons of CO₂ we need to reduce as well as sequester. However, we are convinced that the discussion must become more qualitative as well. It is not only important THAT we reduce emissions, but also HOW we do it and thus how we shape the future of our planet. According to a WEF & McKinsey study, Nature Based Solutions (NBS) will provide for far more than 50% of all future carbon offsets².

NBS can build the bridge between delivering positive social impact, decarbonizing value chains, and increasing biodiversity and providing risk-adjusted returns to investors. As a leader in the field of regenerative agriculture, 12Tree has created healthy, biodiverse, and productive farming systems that use fewer inputs than conventional systems while actively sequestering carbon from the atmosphere.

In striving to deliver strong economic and impact returns to our investors, we have deemed it necessary to build a global operations platform. Having boots on the ground is critical to long-term delivery of key impact goals and profitable projects. Together with our main shareholder, the RRG group, we are now successfully operating tens of thousands of hectares of holistically designed food and forestry systems in 10 countries, with much more expansion planned. Our operations platform consists of a team of world-class agronomical, social, environmental, and economic experts. This report will highlight some of our projects and provide you with a deep-dive into how we operate. Let us know if we can help you design and deliver outstanding economic, environmental, and social results.”

Richard Focken, CEO of 12Tree

DEFINITION: Offsetting means compensating for own emissions through the purchase of carbon credits. These credits are generated from so-called offset projects that prevent or eliminate GHG emissions.

Insetting represents the actions taken by an organization to fight climate change within its own value chain in a manner which generates multiple positive sustainable impacts.

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Introduction

2022 has been an extraordinary year so far. Who would have thought after the previous two years, where life was dominated and restricted by the COVID19 pandemic? Finally the world was on a slow path back to normalcy - gradually shedding restrictions on cross border movements, quarantines, and social distancing - when Russia's war against Ukraine changed geopolitics overnight. In addition to the tragic loss of human life and the suffering of millions of displaced people, the world is once again plunged into uncertainty, as sanctions against Russia further complicate global supply chains and food security. Questions arise regarding trade logistics, energy, commodities, and inflation. Suddenly food systems and their fragility find themselves at the top of the global agenda.

Does that leave any space to think about climate change? Fortunately, yes, and this is the golden opportunity emerging from all this. These crises have made explicit the direct economic and social consequences that arise from disruptions to our global food and resource systems. Further, they render tangible what is at risk in the long-term, as climate change creates natural resource scarcity. In the wake of the Paris Agreement and very visibly at COP26 in Glasgow last year, the corporate sector has risen to the challenge, and institutional capital is increasingly dedicated to climate positive investments.

What is 12Tree's role in all this?

As a leader in channeling institutional investment into scaled agroforestry, 12Tree is proving that investment in NBS can be profitable and drive meaningful social and environmental impact. While still a young company, 12Tree has matured over the years and now manages over 21,000 hectares with a global staff of more than 60 employees and thousands more working directly in the field. Last year we also brought in a new shareholder, Renewable Resources Group Capital Management, who have been active in developing sustainable land use projects for almost two decades and help strengthen our approach at all levels.

Agriculture requires new answers and 12Tree has never shied away from bringing together the most advanced science and technology; innovative field-proven techniques and approaches; and deeply passionate professionals to prove that agriculture can be a vehicle for healing the environment and society. Through science-based approaches and rigorous data collection at the farm level, we have continued to deepen our understanding and refine our approach- all the while learning from the many

successes, as well as the inevitable failures. And these learnings have pointed to one conclusion: we are on the right track. It is now time to accelerate and scale.

In this 2022 Sustainability Report, we share a number of success stories and challenges from the past year. We introduce some of our amazing staff and trusted corporate partners, who share their work, challenges, and personal motivations. We also present the newly codified Sustainability Framework that has always underlain our vision and decision-making, but now systematically feeds into the planning, operations, monitoring and reporting of our portfolio. 12Tree also enters into an exciting new phase of certifying several of our farms under the most well-respected Verra's Verified Carbon Standard (VCS) and the additional Climate, Community, and Biodiversity (CCB)- in order to represent the ambitious, holistic impact that our projects are having.

We have thus structured our sustainability framework, and likewise this report, around the impact that we are driving in these three pillars:



CLIMATE: Our impact on GHG emissions avoidance, reduction and carbon sequestration;



COMMUNITY: Our impact on the livelihoods and wellbeing of workers, rural communities, and smallholder farmers;



BIODIVERSITY: Our impact on terrestrial and aquatic ecosystems and their organisms above and below the soil.

12Tree's vision for sustainability was ambitious and holistic from the beginning and has evolved and matured over time. The increasing importance of carbon markets and the need to extend our thinking from sustainable farming practices to sustainable supply chains and landscapes, has led us to fully embrace regenerative farming practices and implement a strict land use policy. Our ambition is to deliver deforestation-free, climate-positive, socially-responsible products of the highest quality from our farms to your fork.

The world needs to rise to the challenge now

Turning agriculture from a driver of climate change into a solution.

As humans we depend on finite natural resources such as clean water, air, and soil. Yet, our exploitation of natural ecosystems as if they were an infinite resource has had an unprecedented impact on land. Human activities have already altered 70% of the Earth's land area and degraded up to 40% of it³. Food systems are the largest culprit when it comes to land degradation and they account for 80% of deforestation, 29% of greenhouse gas emissions, and they are the leading cause of biodiversity loss. This degradation is perpetuated by steep inequalities as just 1% of farms account for approximately 70% of total agricultural land⁴.

Humans influence natural patterns and are in turn affected by natural processes. Global deforestation and forest loss have weakened ecosystems' ability to withstand climate change. For example, deforestation destroys ground cover, which increases the likelihood and severity of flash flooding during heavy rainfall periods. Floods, in turn, generate devastating social and economic impacts from the destruction of infrastructure and agricultural land, to the contamination of groundwater and its associated impacts on human health. Deforestation is just one way that food systems contribute to land degradation. The conversion of grasslands -which make up more than two-thirds of the land currently being converted to cropland- drives land degradation and contributes to climate change⁵. Hidden in these numbers is the loss of biodiversity and natural carbon sinks. Protecting and restoring ecosystems could provide

more than a third of the cost-effective land-based climate mitigation needed to meet climate change mitigation goals between now and 2030³. However, our actions will need to go beyond protecting remaining natural ecosystems and «re-wilding» altered landscapes. With a rapidly growing population and associated food demands putting increasing pressure on global landscapes, the agricultural sector itself must provide solutions.

Agriculture can and needs to change to net carbon negative production systems that store more carbon than they emit. Agricultural systems can achieve this by switching to more productive, biodiverse systems that restore soils through the meticulous application of regenerative farming practices. This better way of farming becomes an important piece of the puzzle in landscapes where remaining biodiversity is protected, and degraded land is restored to productive use without ignoring the needs of surrounding communities.

With a strong focus on such holistic Nature Based Solutions with regard to these global challenges we transform the way agriculture is practiced for both ecosystem health and human well-being. Profound, measurable social and environmental impacts for climate, biodiversity, and local communities lie at the core of all 12Tree projects.

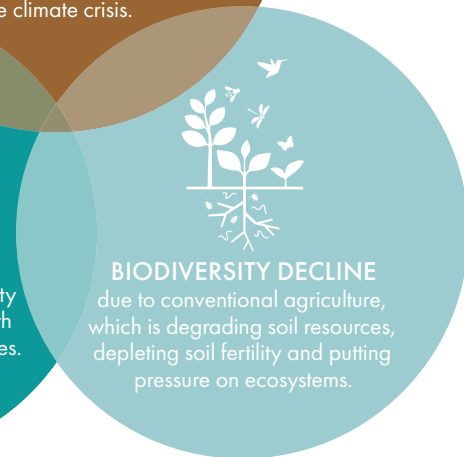
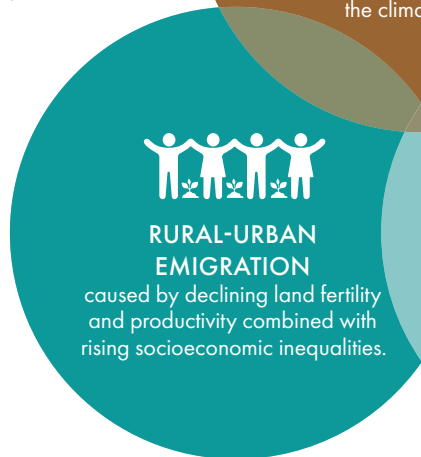


Global challenges and how to tackle them



OUR ACTIONS

- ➔ Optimizing carbon capture on-farm whilst improving soil health
- ➔ Building regenerative farming systems that reduce agriculture's contribution to climate change
- ➔ Strengthening resilience and adaptation to climate change on-farm



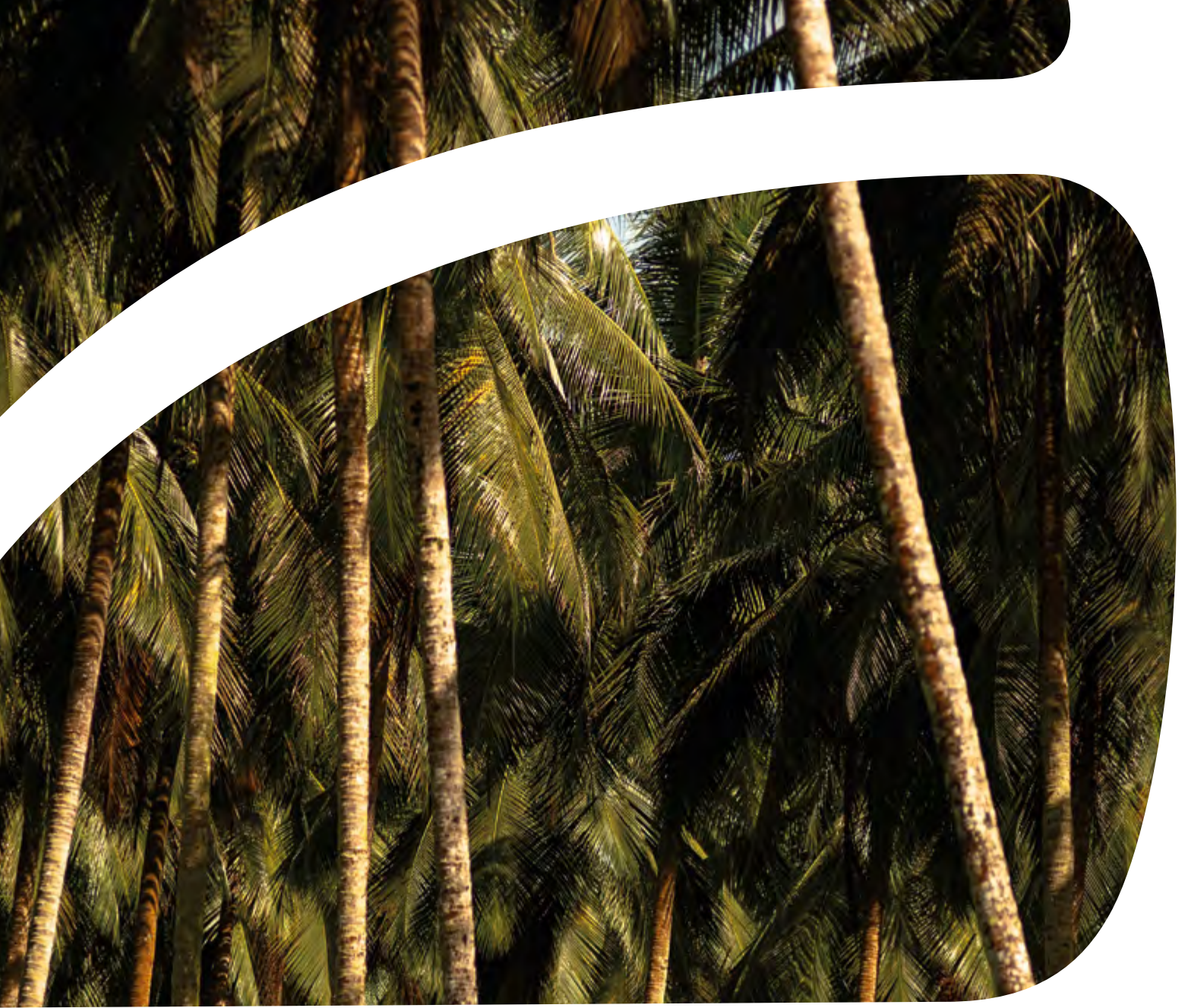
OUR ACTIONS

- ➔ Providing living wages and fair income opportunities in rural areas
- ➔ (Re-)building more resilient food systems by shortening supply chains
- ➔ Gender equality at workplace with no salary gap or other form of discrimination



OUR ACTIONS

- ➔ Restoring ecosystems through reforestation
- ➔ Promoting farm biodiversity through diversified, regenerative farming systems
- ➔ Efficient use of available freshwater resources and consistent wastewater treatment

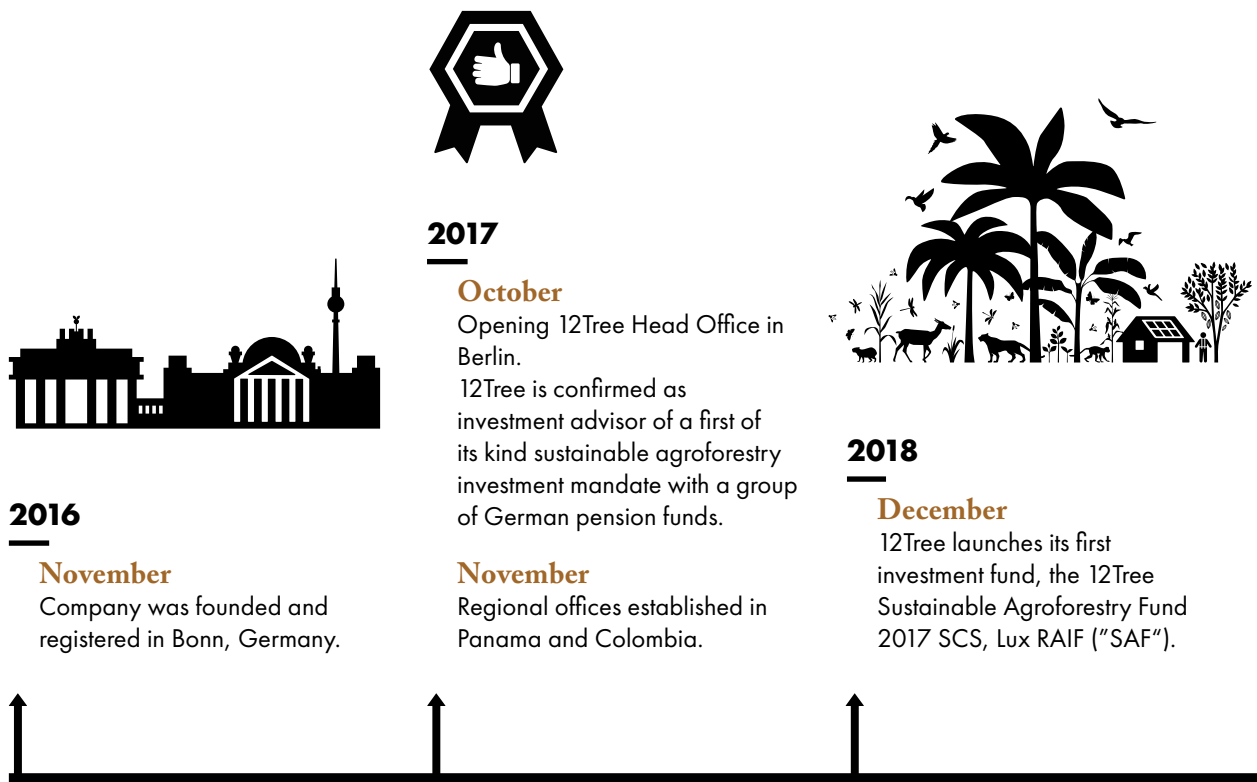


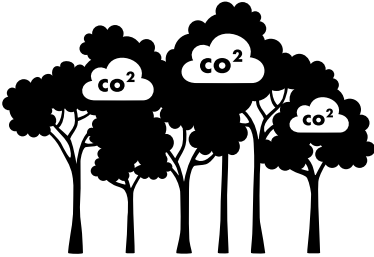
12TREE IN A NUTSHELL

12Tree in transition - beginnings to present

Since the company's foundation in 2016 we have been driven by the urgent need for long-term, Nature Based Solutions to effectively fight climate change.

By targeting agricultural practices and food value chains, our vision is to revolutionize the industry and prove that regenerative agriculture and profitability are not contradictory. Since our inception, more than 21,000 hectares of land have been sustainably transformed, 5,500 hectares of conservation area have been protected, and more than 1,500 secure jobs have been created. The following timeline illustrates how 12Tree has evolved from a small start-up into a multinational company.





2019

March

First corporate workshop with employees and partners as well as launch of the farmer exchange platform.

May

Winner of the initiative 20 x 20 portfolio award.

October

12Tree's Platanera Rio Sixaola receives the Carbon Neutral Award from the Costa Rican government.

November

12Tree's Chimelb farm wins the Sacha Award for agroforestry.

December

12Tree is signatory of the Principles for Responsible Investment (PRI).



2020

January

12Tree and the International Center for Tropical Agriculture (CIAT) sign partnership agreement.

August

12Tree establishes its central Technical Services Team (TST) to provide agronomic advice by leading practitioners to its portfolio of farms.

2021

June

12Tree signs its first contract with Terra Global to certify its eligible farms under the VCS and CCB carbon certification standards.

12Tree wins Environmental Fund of the Year Award.

July

12Tree brings in the RRG Group as new majority shareholder.

August

Launch of 12Tree's Regenerative Agriculture Academy.

September

12Tree partners with Mars Wrigley and ECOM to develop a modern sustainable cacao agriculture project and expands staffing in its Bogota office.

November

12Tree joins the Natural Capital Investment Alliance (NCIA).



What do we do and what makes us unique

12Tree's business model is based on three pillars: asset management, project development and operations, and marketing our agriculture and forestry products.

ASSET MANAGEMENT

We use our understanding of the needs of professional investors to remove hurdles for investment and unlock scaled capital to be directed into large-scale impactful projects in regenerative agriculture.

FARM OPERATIONS

We operate projects ourselves, enabling us to guarantee zero deforestation, regenerative management practices and transparency throughout the resulting value chain.

SALES AND MARKETING

We market and sell the products produced on our farms directly - at premium prices and providing full traceability - thus eliminating the costs of intermediaries.

The synergy of these three pillars not only makes 12Tree unique in the marketplace, but it also enables us to affect real change. By allowing capital to be raised and invested at scale in regenerative agriculture projects, we are not only generating financial returns for our investors, but also measurable social and environmental returns, for climate, community and biodiversity.

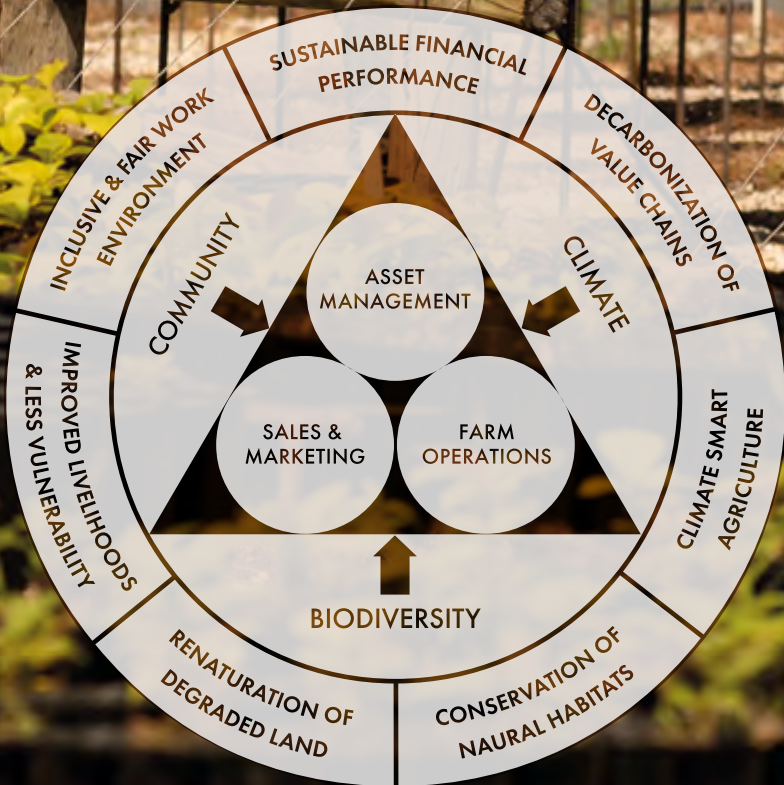
Our approach to sales and marketing is simple: to make sustainability pay. We create meaningful stories and decouple the products of our farms from the daily fluctuations of commodity market prices - because we decommoditize them and create a direct link between origin and consumer. We generate premiums for sustainable products and cut out middlemen which enables us to pass on higher prices to the farmers that we purchase from. This approach ensures that we provide long-term benefits for all stakeholders and lead the industry away from extractive practices.

Sustainability is at the heart of everything we do. Our team of experts in environment and ecology, social impact, and carbon cycles are involved in shaping the company strategy; advising our deal teams in project design; providing support for integrating sustainability into operations; and providing meaningful measurement, monitoring, climate accounting and reporting to all stakeholders - our investors, buyers, and the public.



"We are working every day to make this asset class more mainstream, because we believe it is the most credible and fastest way to close the financing gap in climate change mitigation, biodiversity conservation, and rural poverty alleviation."

Oliver Hanke
Chief Sustainability & Marketing Officer



Our team

Whether in administrative roles or out in the field, it's the people within 12Tree that drive the real impact.

Each and every employee contributes to the achievement of our organization's goals- that's the secret behind 12Tree's success and growth since its founding in 2016. As a young and dynamic organization, 12Tree supports diversity and openness, as reflected by the composition of our team. The 12Tree team consists of more than 60 talented, motivated, and value driven individuals representing more than 13 nationalities. 12Tree distinguishes itself from traditional office structures by supporting family-friendly and flexible work environments. With offices in Berlin, Panama City, and Bogota our team is also based remotely in about 10 other cities. The hope is that this enables our employees to achieve a better balance between their private and professional lives.

We believe that flat hierarchies, employee empowerment, trust, and an open work culture drive our team's productivity and performance. Constant knowledge exchange across departments is of great importance to us, and we cultivate different opportunities and initiatives to encourage it. For example, in 2021, 12Tree developed the "Regenerative Agriculture Academy", an internal course and series of workshops aimed at teaching employees and partners about regenerative farming and establishing a thriving culture of learning and dialogue.

We know that a creative and productive work environment cannot be taken for granted. This is why team building measures and initiatives in the form of team events and workshops are so important to us; whether it is a multi-day team event in the Dominican Republic with almost 100 participants from employees to partners; or a specialized workshop in a smaller circle to define key performance indicators for the company; or a fun sport event with groups competing against each other. For such a "virtual and global" company, face-to-face exchanges and the experience of personal encounters are crucial. Despite the pandemic, our team building initiatives did not entirely stall and we became quite creative when it comes to online events ... but we certainly look forward to good old corporate events again.

"12Tree is a team of professionals who are pioneering deeply sustainable nature-based investments – with the goal of making carbon sequestration, holistic social impact, and biodiversity investible for institutional and professional investors. We achieve this by putting the human being and nature at the center of all of our activities. We walk the talk."

Richard Focken
CEO

"My job at 12Tree is super multifaceted. It never gets boring, and I learn something new every day and I appreciate the high degree of flexibility."

Marie Schönig
Sustainability Associate

"Being at 12Tree also means that we are part of the agricultural and food transition and that we contribute to making this world a better place for us and our children. Whatever the project you are involved in, you can be sure that 12Tree has a sustainable impact on the region and the community."

Yara Massad
Project Supervisor

"What I love about working at 12Tree are the constant learning chances and the opportunity to work side by side with some of the pioneers in regenerative agriculture and sustainable investments, who are really pushing forward the climate change mitigation and nature-based solutions agenda."

Alfredo Zanardi
Business Development
Manager



12Tree Impact Incubator: Sustainable impact beyond the farm level

The productivity of each farm and the quality of the crops depend on high quality inputs, efficient technology and reliable services. These are often hard to find where we operate; especially at the highest sustainability standards. This has given rise to the idea of founding our own tech and service accelerator to offer passionate start-ups the opportunity to grow, with 12Tree farms as a potential customer.

The first venture to emerge from the accelerator was the irrigation specialist Smart Flow, interviewed below.



Smart Flow Irritech Solutions: Every drop counts

Smart Flow Irritech Solutions was born in 2020 with the aim of bringing efficient and sustainable irrigation technology to regions which are currently underserved. They identified the Latin American and Caribbean as their key focus region. Smart Flow understands irrigation as a SERVICE and aims to become a premier irrigation service provider through strategic manufacturing partnerships, technology implementation, and unmatched customer service. In this interview, Nick Graziano, the CEO of the young company, talks about Smart Flow's approach and the positive impact it strives for.

What makes Smart Flow unique?

Smart Flow is an irrigation solutions provider. In several countries, 12Tree could simply not find a good enough service to deliver the complex and high-tech sustainable irrigation solutions it needed for its projects. We

provide our customers with turnkey irrigation project solutions fitting the individual requirements of the farm as well as regional climatic conditions. Smart Flow also delivers consulting services to optimize existing systems, incorporate new technologies into farm operations and fine tune irrigation scheduling. We have experience with all forms of irrigation, from conventional micro irrigation applications to mechanized systems. The big advantage here is that we are not reduced to one or two irrigation technologies, we can select and design the best system from all available options in accordance with the needs of each farm. Therefore, we have many supply relationships with local as well as international manufacturers.

Instead of selling a maximum of technology as some tech providers typically try to do, Smart Flow accompanies and supports its customers through the entire irrigation process. Smart Flow starts

with site analysis and the selection of the appropriate irrigation type and then provides investment analysis of the proposed system, installation of the irrigation infrastructure, and system maintenance, monitoring and optimization. We do all this in regions that are currently underserved but in urgent need of sustainable and high-quality irrigation solutions.

What kind of impact, environmental as well as social, do you & your team strive for?

One of the first steps when starting a new project is an onsite analysis of the local conditions. This includes the availability of freshwater resources. Depending on water availability, topography and crop selection, the optimal irrigation system is chosen. It can be argued that by installing an irrigation system and turning previously unproductive land into a productive agriculture field increases the overall water demand. But at the same time,



"We empower entrepreneurs to (re)design a world of sustainability."
Anas BaChar
CEO Impact Incubator

"Climate smart irrigation is insurance against climate change impacts."
Nick Graziano
CEO Smart Flow

irrigation decreases the dependency of the region on food imports, reduces transportation emissions, creates new job opportunities and can therefore actively contribute to the rural development. Food needs to be produced to meet growing global demand, and Smart Flow contributes to securing the food production close to the final consumer.

Agriculture is often crucial to a given region's economy. Better solutions to irrigation will lessen the dependence on the more and more unpredictable rainfall patterns. It also helps to bring needed capital to relatively poor regions, thus helping regional economic development.



SUSTAINABILITY IS OUR DNA



Sustainability framework

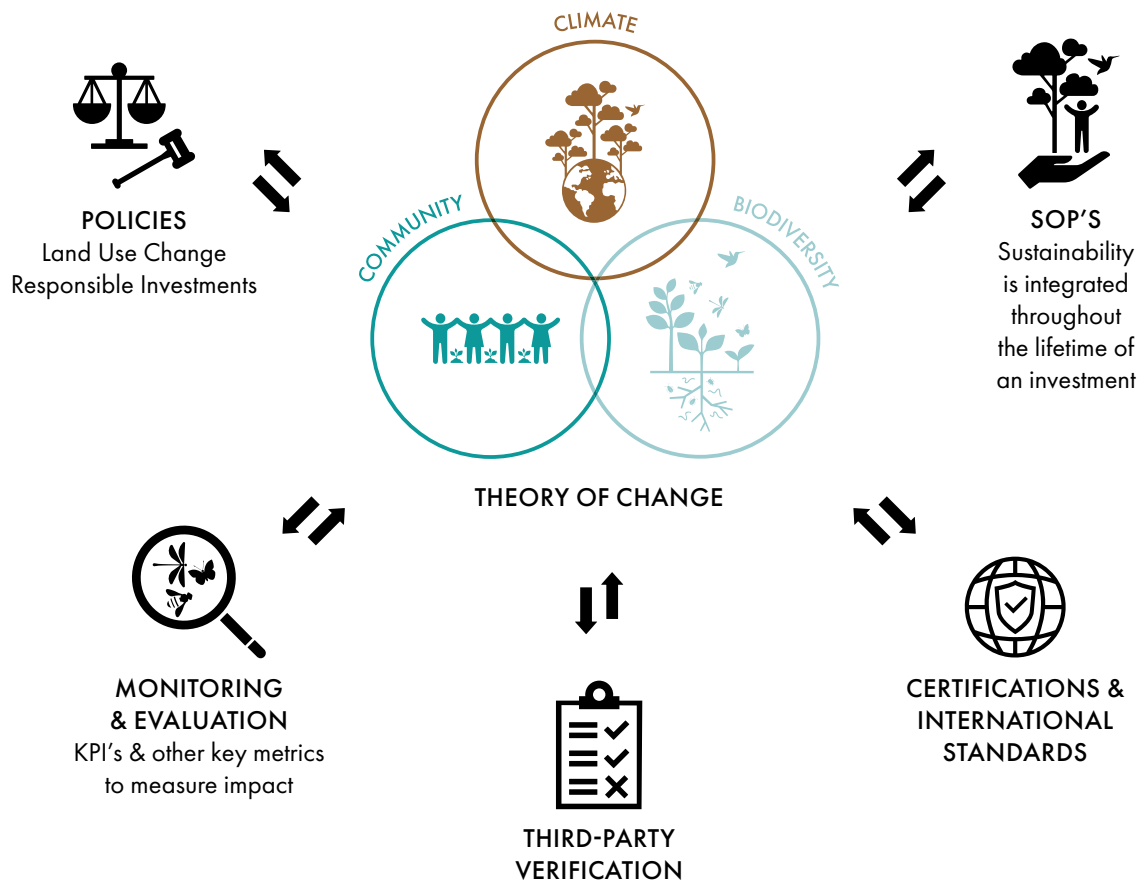
Sustainability is embedded in every aspect of our business.

Many companies struggle to integrate a separate Environmental, Social, and Governance (ESG) strategy into their business and operational strategies. For 12Tree, however, our holistic approach means that climate, community, and biodiversity impacts are implicit in our business development and operational decisions. Our Sustainability Framework provides the structure for developing, implementing, monitoring and verifying the different aspects of sustainability in individual projects and across our portfolio.

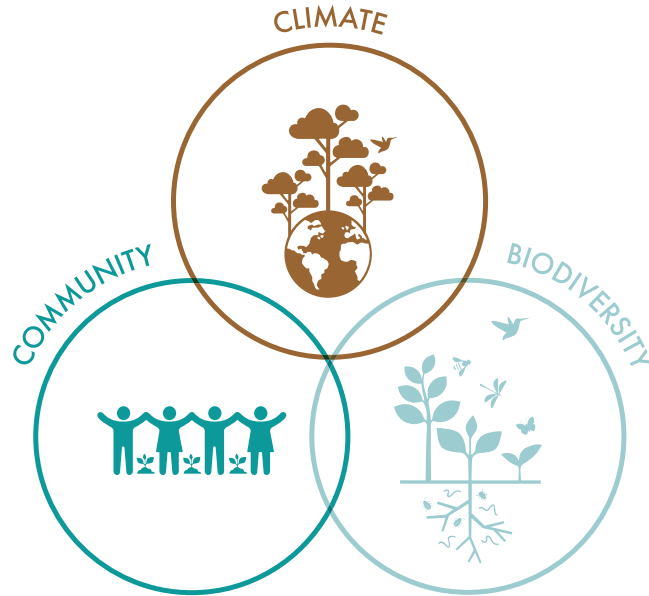
Our corporate Theory of Change (TOC) provides the vision and guidelines for why and how we will drive positive impact through our projects. That vision is made tangible through the detailed and monitorable actions developed in our corporate policies and standard operating procedures (SOP), which we track using progress and impact indicators. Independent third-party verifications and audits from internationally recognized and industry-leading certification bodies help us to measure and report

our impact to both investors and the general public. In every way, these different components of the Sustainability Framework are complimentary and reinforcing, meaning that as international standards become more rigorous, so too will our policies; likewise, as our vision becomes more ambitious over time, our progress and impact indicators will reflect the higher standards that we are achieving.





Theory of Change



THE THREE PILLARS OF SUSTAINABLE IMPACT

We believe that a holistic approach to farming can turn the root cause of many of today’s problems into solutions. Successful outcomes require an intimate understanding of the landscape as well as the challenges facing the people living in it.

Our projects ensure financial returns, but moreover they sequester carbon, restore soils, protect key habitats, encourage ecological diversity, and ensure quality jobs and dignified livelihoods for workers and rural communities. To capture this vision and help translate it into practical actions that we can take -and impacts that we can measure- 12Tree developed a “Theory of Change” model to be applied at each individual farm, and across our portfolio.

A Theory of Change (TOC) model explains an organizations path to impact by mapping how actions undertaken by the organization produce both short-term and long-term outcomes. By clearly identifying intended outcomes, a TOC helps an organization to identify the indicators that it should use to track progress towards a goal, and ultimately measure the degree to which the goal is achieved.

The three pillars of sustainable impact

Our TOC is structured according to three key areas of sustainability: **CLIMATE**, **COMMUNITY**, and **BIODIVERSITY**. These pillars strategically align with the social and environmental impact verification methodologies of international standards for land management projects aimed at convincingly mitigating global climate change, conserving biodiversity, improving well-being, and reducing poverty in local communities. This includes the standards developed by the Climate, Community and Biodiversity Standards (CCB Standards) developed by Climate, Community & Biodiversity Alliance, a partnership of CARE, Conservation International, The Nature Conservancy, the Rainforest Alliance and the Wildlife Conservation Society.

From concept to practical implementation

Each individual 12Tree farm builds sustainable practices into its operations in a way that is relevant to the specific ecological, cultural, and agronomic context of a protect. Moreover, the progress and impact indicators tracked by 12Tree are directly aligned with the United Nation’s Sustainable Development Goals (SDGs)- allowing us to evaluate our contribution towards these universal goals. We look forward to reporting our progress and impact using this new framework from 2022 onward.

Deforestation and Land Use Change Policy

Responsible supply chain initiatives must not take place in isolation.

Instead, in line with governments and others, we need to think in terms of landscapes in order to halt deforestation, improve land governance, reform public policies and incentives, and shift consumption patterns to respect and recognize increasingly finite resources. When such multi-pronged approaches are effective, supply chain initiatives can help to end deforestation and conversion of natural ecosystems while also contributing to Nationally Determined Contributions (NDC) for greenhouse gas reductions under the Paris Agreement. Moreover, they can support equitable rural development and the wellbeing of farmers, workers, and communities.

To achieve the vision of truly transforming the way agricultural and commercial forestry are practiced today, we needed an effective roadmap or rule book that could help us guide our efforts across the different geographies we work in and for the entire array of products that we offer. The inherent progression of such an effort includes making a corporate commitment to de-couple production from deforestation and ecosystem change, conserving biodiversity, improving well-being, and reducing poverty in local communities. The portion of the supply chains in which we work respects land rights, workers' rights, and other human rights enshrined in international law.

To make a real difference, we created 12Tree's Land Use Change Policy as a corporate commitment that sets rigorous and clear definitions of what types of vegetation we and our suppliers can and cannot clear. Using established, meaningful definitions for protected vegetation types, such as High Conservation Value⁶ or High Carbon Stock⁷, and by committing to a Gross Zero Deforestation approach, meaning we do not allow deforested land to be compensated with additional forest planting, our commitment will maximize the amount of forests we can protect. It will further reduce any legal, regulatory, and/or reputational risk related to deforestation, conversion, and human rights violations occurring in our operations and sourcing areas.



DEFINITION: High Carbon Stock (HCS) is a methodology that distinguishes forest areas for protection from degraded lands with low carbon and biodiversity values more apt for development.

High Conservation Value (HCV) areas are defined as natural habitats of outstanding biological, ecological, social, or cultural values at the national, regional, or global level.



OUR FARMS



Portfolio overview

OUR FARMS

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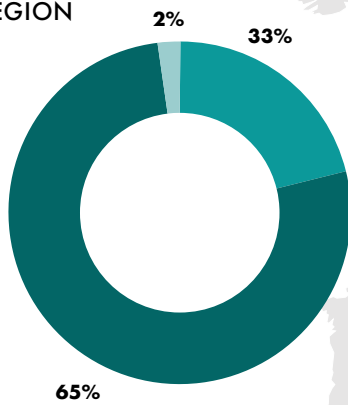


HECTARES PER REGION

MENA region
600 ha
2%

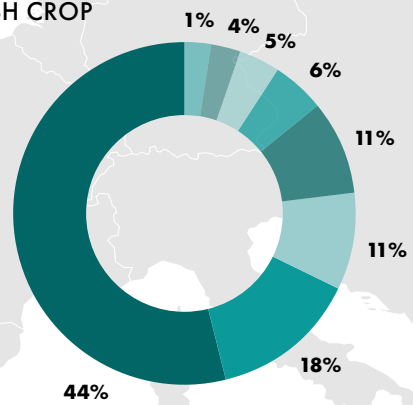
Central America
6,860 ha
33%














South America
13,603 ha
65%



HECTARES BY CASH CROP

1% Dates
4% Cardamon
5% Musa
6% Coconut
11% Coffee
11% Rubber
18% Cacao
44% Forestry



- 
Acacia
- 
Coffee
- 
Pineapple
- 
Banana
- 
Dates
- 
Rubber tree
- 
Cardamon
- 
Gliricidia
- 
Teak
- 
Cacao
- 
Honey
- 
Native precious wood
- 
Coconut

KPI analysis at portfolio level



SOCIAL METRICS

LOCAL INTERACTION AND INCLUSION

- **1,065** smallholder farmers with access to training, inputs and/or markets provided by 12Tree
- **90** documented meetings with Smallholder farmers for 2021

GOOD WORKING CONDITIONS

- **29%** staff turnover*, **11%** incident rate

* This average value does not include the Cuango farm



ECONOMIC METRICS

ACHIEVING GOOD PRICES

- **12%** of premium price obtained above bulk price*

* This average is based on prices obtained for cacao, coffee, bananas and cardamon

COST INPUT EFFICIENCY

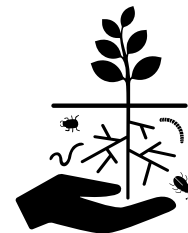
- About **46%** of total production costs spent on inputs



ENVIRONMENTAL METRICS

SUSTAINABLE LAND MANAGEMENT

- **21,063 ha** under regenerative management
- **75%** of the productive land is certified



PROTECTING AND ENRICHING BIODIVERSITY

- **18%** of the farms are conservation area

SOIL HEALTH

- Soil restoration measures were carried out on more than **58%** of the farm area

CLIMATE CHANGE MITIGATION

- **5 farms** in VCS certification process





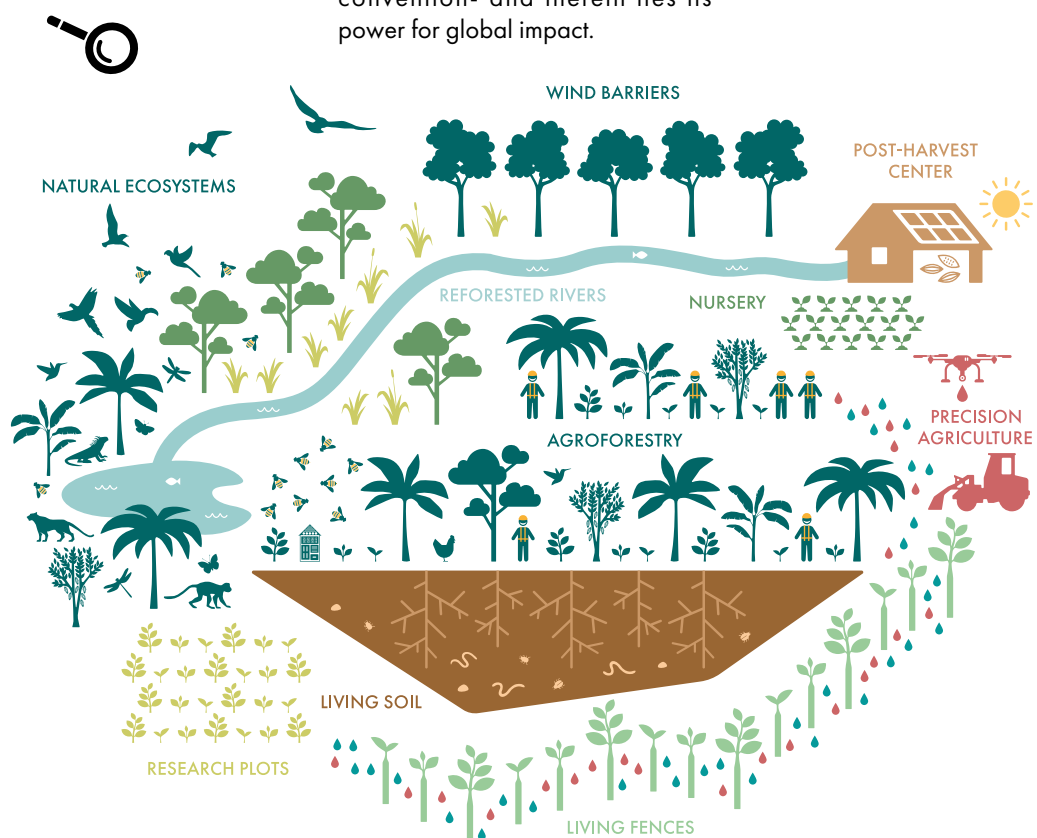
Regenerative Agriculture: From aspiration to company standard

Regenerative Agriculture is quickly becoming a part of the vocabulary of today's agricultural sector.

In some ways, it has become the new buzzword, not unlike "sustainable" or "green" of the recent past. If you ask ten farmers what regenerative agriculture looks like, or what it accomplishes, you will likely get ten different answers. Over the past three years, 12Tree has dedicated significant time and resources to answering these very questions. And though we feel we are just beginning on this journey, we have been delighted with the results. It is our pleasure to share with you here our thoughts and experiences on regenerative agriculture.

So, what is regenerative agriculture? It is a set of practices focused on the active management of above-ground and below-ground biodiversity which bring economic, social, and environmental benefits to our farming systems. It is knowledge intensive agriculture that does not allow for prescriptions that are universally applied across farms, but instead requires practitioners to utilize their toolkit of practices to develop a tailored solution for each farm. It emphasizes the maximization of long-term profits, not through maximization of yields – the conventional mindset – but through the optimization of yields, inputs, and resources. Importantly, regenerative agriculture is not financially concessionary but instead can and should be more profitable than our current convention- and therein lies its power for global impact.

We see regenerative agriculture as the natural next step in the progression and professionalization of agriculture. The "green revolution", "precision agriculture", and "conventional agriculture" have all done important things for the world. It is because of these advances that we have been able to significantly reduce costs and improve access to food, directly contributing to reduced global hunger. Regenerative agriculture does not destroy these paradigms. Rather, it takes the best from each of them and adds the perspective and awareness that will be necessary to feed our growing population without destroying our planet.



Many potential benefits of regenerative agriculture have been advocated by professionals and organizations. From 12Tree's perspective -given our research and empirical experience across our farms- we believe that regenerative agriculture has the power to make farms (large and small) more resilient to input price shocks and increase the profitability of food production.

How do we go about it then?

First and foremost, it is important to acknowledge that there is no silver bullet, no single practice, no prescription that will achieve all of the benefits above. Instead, it is the intelligent combination of regenerative practices given a farm's regional, climactic, cultural, and crop context that enables these benefits. It is the system that drives the change. All of our farms utilize some combination of the following regenerative practices to achieve these objectives:

1. AGROFORESTRY SYSTEMS

These systems include a tree crop and more than one actively managed secondary or service species. In our farms, we have 17 distinct agroforestry systems that include 8 primary crop species, 6 forestry species, and various other support species. Compared to monocultures, this increased biodiversity promotes nutrient cycling and organic matter increases, reduces pest and disease pressure, and provides diversified cashflow. Additionally, these systems sequester significantly more carbon than their conventional counterparts.

2. KEEP THE SOIL COVERED

Uncovered soil is exposed to high temperatures, wind and water erosion, and compaction. By keeping our soils covered with cover crops or via non-chemical weed control we counteract these effects while also increasing nutrient cycling, improving soil water retention, and feeding below-ground biodiversity.

3. NATURAL NITROGEN SOURCING

The largest part of most farm's carbon footprint is related to the production, transport, and application of nitrogen fertilizers. By utilizing leguminous plants (beans) that are able to "fix" or capture and hold nitrogen in the soil, we reduce the need for nitrogen fertilizers, and therefore the carbon footprint of our products.

4. REDUCE DISTURBANCES

Many of the advances in agricultural technology involve physical and chemical disturbance of the soil that, when overused, destroy above- and below-ground biodiversity. We seek to reduce or eliminate chemical or physical disturbances in order to promote a thriving soil microbiome and ecosystem which in turn reduce pest and disease pressure, cycle nutrients, sequester carbon, and reduce reliance on external inputs.

5. PROMOTE DIVERSE LIFE

Conventional agriculture has begun to look at a farm field as a laboratory. In extreme cases all life is eliminated except for the single crop that is planted. This creates an imbalance that leaves farms susceptible to pest and disease outbreaks and reduces the biodiversity of surrounding areas. Through activities such as on-site microbe propagation in our farm labs, compost tea production, predator population promotion, and insect population promotion, we seek to bring a balance of life to our farms that mitigates pest and disease pressure and creates symbiosis in the rhizosphere.



We feel we are just scratching the surface with the interventions we have made since the inception of our company but are happy to report that – next to a number of initial mistakes – we have seen several examples of success across our farms as we implement these practices. For example:

1. A 50% REDUCTION IN CHEMICAL SPRAYS for the main banana disease “Sigatoka” and 75% reduction in sprays for mealybug at Platanera Rio Sixaola in Costa Rica. This is directly linked to the biodiversity existent in the production system that reduces pest and disease pressure.

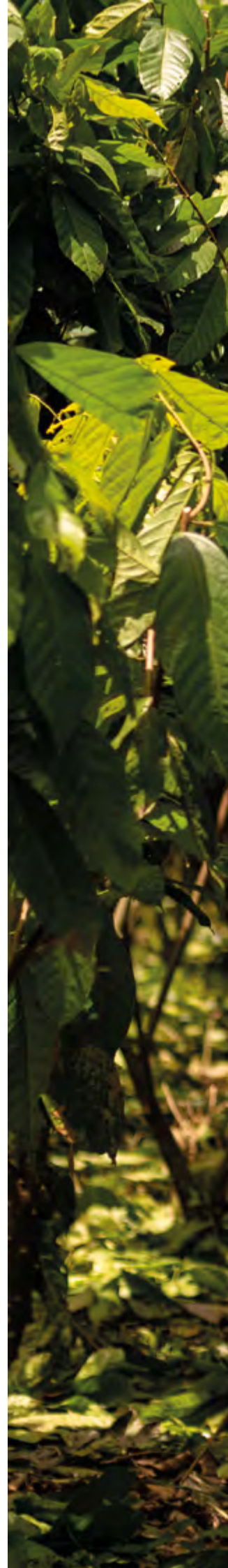
2. ACHIEVING YIELD CURVES at Andean Cacao in Colombia that are equal to or greater than the industry standard for cacao production, but doing so in a diverse agroforestry system with up to 6 actively managed species.

3. ELIMINATION OF PESTICIDE, FUNGICIDE, AND NEMATICIDE use on our plantains at Cuango in Panama. This is directly related to the biodiversity of the agroforestry system, the cover species, and the surrounding primary forest.

4. CONVERSION OF MORE THAN 4,000 HECTARES of cattle pastures into agroforestry systems which reverses the carbon footprint of the land.

... and many more. Though we are happy with our success so far, we recognize that there is still so much for us to learn. We believe that the full potential of regenerative agriculture is yet to be fully understood and we are happy to be working together with many individuals and organizations to further develop the field.

Written by Kalob Williams,
Chief Operations Officer







Cuango: Non-chemical alternatives to weed control

Globally, weeds pose the greatest threat to crop yield, generating losses that surpass those caused by both pests and pathogens⁸.

Defined by their rapid growth, high rate of reproduction, and persistence, weeds compete with crops for limited light, nutrient, and water resources. Once established, they are notoriously difficult to get rid of. In addition, their seeds often remain dormant in the soil for extended periods of time, suddenly re-emerging with rainfall or when soil is tilled or fertilized⁹. Modern conventional farms typically rely on chemical treatments to control weeds. But the intensive use of chemicals also bears many environmental and health risks¹⁰. Therefore, a general rethinking around weed control is underway. Many conventional, but especially sustainability-oriented farms, are exploring non-chemical alternatives. This is not an easy transformation- it takes time, is labor-intensive, and often entails considerable upfront costs. But on the other hand, the research and empirical evidence resoundingly proves that reducing chemical inputs leads to healthier, more productive crops and results in more resilient agricultural systems in harmony with people and nature¹¹.

Identifying alternative approaches to weed management is thus a critical part of 12Tree's efforts to integrate regenerative agricultural practices across our portfolio. Towards this end, 12Tree carried out a study on non-chemical weed management approaches that could effectively help phase out glyphosate and other herbicides at our Cuango Farm in Panama.

Cuango and its weed problem

The Cuango Farm sits along the Cuango River on the northern Atlantic coast of Panama. The tropical humid climate is ideal for the cultivation of cacao, plantains, and

forestry. However, the farm is facing a major challenge in the form of heavy weed pressure from *Brachiaria* grasses. *Brachiaria* grasses are a non-native, invasive grass species introduced by the former landowner to serve as feedstock for cattle. For decades, the grasses went unmanaged across the property, resulting in their ubiquitous presence across the farm, as well as in a large *Brachiaria* grass seedbank. When 12Tree took over the property and began planting productive crops, the farm management team faced tremendous weed pressure from these grasses. As areas were cleared of vegetation and the crop seedlings were planted, *Brachiaria* grasses grew back and spread, affecting the growth of the seedlings and depriving them of light, space, and nutrients- essentially choking them.

Exploring non-chemical treatments for *Brachiaria*

Over the past 2-3 years, the team around Emily Fortney Alvarez (general manager) and Roderick Binns (farm manager) have undertaken the Herculean task of combatting this overwhelming weed pressure while simultaneously reducing herbicide dependency through the gradual introduction of non-chemical approaches.

The Cuango team relies on a combination of mechanical and cultural controls. Mechanical controls refer to physically cutting down the weeds, while cultural control refers to a change in practices which produces a fundamental change in weed dynamics. Cuango's cultural control approach focuses on increased plant competition. If emerging *Brachiaria* grasses have no competition from vegetation besides the vulnerable cacao crop seedlings, they will easily destroy the young crops. However, when the ground is already covered with crops and shade elements are integrated into the system, it is more difficult for the *Brachiaria* grasses to take hold. For this reason, Cuango's cacao is now grown as part of an agroforestry system that includes plantain,



Cacao and plantain intercropped with a dense mulch cover on the ground in order to prevent the emergence of weeds.

because the fast-growing plantain provides near immediate shade- which cacao seedlings love and the light-dependent *Brachiaria* grasses hate. This effect is further enhanced by leaving narrow strips of natural vegetation, referred to as “bio bands”. They provide both shade and a plant diversity, which reduces weed pressure from *Brachiaria*.

Lessons learned

Cuango is an excellent example of a farm delicately balancing the short-term demands of an efficient and productive farm with the long-term vision of sustainable, regenerative land management. Through observation, research, and piloting, Cuango has explored different regenerative practices and identified some that are not effective for that farm - such as a failed experiment with pigeon pea ground cover- and some that work even better than expected- such as the cultural management weeds with shade crops, bio bands, and dense mulch cover. This combination of practices- along with the preservation of the primary forest directly surrounding the farm- has resulted in Cuango eliminating the use of pesticides, fungicides, and nematicides on its plantain crops! A system that is not disturbed by a regular input of chemicals, that has healthy and diverse vegetation and continuous ground cover, is a resilient system that can better cope with other external stressors and ultimately deliver better yields. While the farm is not certified organic and has not disavowed the use of chemical treatments for specific acute treatments- it has proven the enormous potential of non-chemical approaches to weed control.

Critical to the successes thus far has been an ambitious approach that bundles several non-chemical weed management methods, all of them with different modes of application and invariably different individual and cumulative effects. This means more effort and higher costs in the short term, and also less clarity on the direct effect of each method. For this reason, the meticulous record-keeping and diligent care by its dedicated management and field teams has been equally critical to the farm’s progress on this regenerative journey. If you are interested to dive deeper into this topic, please see the results from the Master thesis written on this topic.

Scan the QR code for the master thesis results or click here:





Ambrosia: Snakes as a sustainable solution for pest control

There are many ways to control pests. The easiest is probably the use of chemicals. However, this often brings unpredictable negative side effects.

12Tree's Ambrosia farm in the Dominican Republic therefore favors non-chemical methods, such as biological pest control. Biological control refers to reducing pest populations by introducing natural enemies, so called biological control agents, such as animals, viruses, bacteria or even fungi¹².

In 2021 the Ambrosia farm suffered from a severe rat infestation, which caused extensive damage to the cacao pods, with production losses of up to 20%. Instead of controlling the rats with poison, which might have killed other beneficial species or contaminated the soil, the farm based their pest management on snakes. We discuss this approach with Ambrosia's farm manager, Gerardo Navarro.

Why snakes? How did you come up with the idea?

Snakes are one of the most effective predators of rats in the Dominican Republic. The method of keeping snakes inside plantations is therefore not that unusual. We used an endemic snake species, the Hispaniola boa (*Epicrates striatus*).

The snakes have always been with us on the farm, but in much lower population numbers. Before we started using snakes, we had set up rat traps, but this wasn't successful.

Where did you get the snakes from?

We worked together with the surrounding communities. We put up signs that we needed snakes and as a result, many snakes were sold to us for \$10 US dollars each.

What is the situation now? Are the rats gone?

Since we released the snakes on the farm, we no longer have a rat problem. In addition, since the introduction of the snakes, the population of woodpeckers on our farm has also been reduced. They cause great damage to our coconut

palms as well as cacao trees every year. The risk of losing their offspring to the snakes has driven the woodpeckers into the surrounding conservation areas.

Are there any risks for your team coming along with the increased snake population?

The Hispaniola boa is non-venomous and no attacks on humans have been recorded. It is an endemic species on the island of Hispaniola and is threatened with extinction, which means that with this work we are also contributing to the conservation of this species. It remains to be observed whether the snake population will migrate as soon as they no longer find enough food or whether they may have negative effects on beneficial animals. This has not been observed so far.





DEFINITION: Endemic species are plants and animals that exist only in one geographic region. Species can be endemic to large or small areas of the earth: some are endemic to a particular continent, some to part of a continent, and others to a single island.



SMALL INTRODUCTION TO DATE PALMS: Date palms are one of the world's oldest fruit trees and come in nearly 500 varieties. They are a traditional crop throughout the Middle East and North Africa, since they are capable of growing in hot, arid climates with temperatures ranging from 24 to 34°C. They adapt well to harsh climatic conditions, even when water is scarce, and temperatures are extreme. In addition to their delicious flavor, dates are nutrient dense and culturally significant in many parts of the globe¹³.

Tafilalet: Capturing carbon and driving productivity in the desert

Among its greenfield regenerative farming projects, in 2019 12Tree began planting organic date palm trees in the Moroccan desert with the goal of contributing to global GHG sequestration.

Tafilalet is 12Tree's first project in the Mediterranean basin. Located to the south of the Atlas Mountains, in the Draa-Tafilalet region of Morocco, it covers 600 hectares of date palms. The Draa and Ziz rivers supply water to the Tafilalet Oasis, the largest oasis in Saharan Morocco and a site of ancient date plantations. The date palm is known for its ability to grow in extremely harsh climatic conditions and highly saline lands, making it ideal for this region.

The Tafilalet project began with 12Tree's goal of sequestering carbon through agroforestry, and evolved to support complimentary goals of halting desertification and restoring degraded desert landscapes. Tafilalet is operated by Africa Organics S.a.r.l., a Moroccan agricultural project operator combining the experience and expertise of local professionals with the knowledge of the wider 12Tree team. Due to the success of, and interest in, the project to date, Africa Organics plans to acquire two additional projects in 2022: a 600-hectare date palm and olive tree farm, and a 250-hectare apple, pear, stone fruits, and olive tree farm.

Given our historical focus on Latin America, Morocco may seem an odd choice for new projects. However, we were convinced by the country's enormous agricultural potential and considered it a perfect starting point to develop our new Mediterranean investment strategy. Morocco's economy is heavily reliant on agricultural performance - 14% of GDP and 40% of the working population depend on it. In 2008 the Moroccan government adopted the "Green Morocco Plan" as a national agricultural strategy, putting modernization of agriculture at the center of the national economic development plan. In the context of dates farming,

the plan is to turn Morocco into a dates exporting country, planting 3 million palms to add to the 6.6 million already existing plants with production reaching 185,000 tons by 2030. At the national level, date revenues will help to fight rural poverty and encourage the preservation of a certain population density in very remote areas.

As part of its support for the implementation of the Green Morocco Plan, the state provides financial assistance to encourage private investment in modern precision agriculture. The assistance is implemented through the Agricultural Development Fund and covers 30-60% of total costs for water management and land improvement, agricultural equipment, seeds, trees, packing houses and value-added units, and exports. In addition, the Generation Green strategy (2020-2030) is a new agricultural program with the goal of planting 5 million trees. These strategies demonstrate that Morocco is making a concerted effort to support domestic consumption and export, putting the Tafilalet project in a unique position. As the only organic-certified project in an area undergoing rapid land development, Tafilalet will thus act as a role model for others to adopt the use of innovative technologies and practices to drastically reduce the water consumption of farming in this extreme climate.

What has been achieved so far

Our project aims to strengthen the resilience of nearby communities in the face of climate change while also preserving the region's cultural heritage and biodiversity. Our goal is to make the region more appealing for date trading, which is especially important given that Figuig is Morocco's poorest district. In 2021, we hired 16 permanent workers and 63 part time workers, all of which are provided medical insurance and registered under the national social security scheme.



When completed, the project will create hundreds of jobs and generate significant local wealth. Transportation for local workers, construction of a building to house the workers, training facilities, an infirmary with a doctor, recreational areas, sewage treatment, recycling, and agricultural waste composting are all underway. In 2022 we plan to rehabilitate the region's largest school, which has 370 students, and ensure that all the region's medical centers have the necessary equipment.

Tafilalet is also leading the way in science and technology in the region. Our farm has been certified organic by Kiwa BCS since day one and follows very strict phytosanitary and quality measures to prevent the spread of the Bayoud disease, which is historically known for destroying 65% of Morocco's date palm plantations. We have invested in research and development experiments and collaborated with a Ph.D. student to increase the

region's knowledge of date palm production. We will be testing bio-fertilizers, intercrop systems, cover crops, and different irrigation techniques.

Tafilalet aims to be a lighthouse farm at the international, national and regional level. Our goal is to encourage healthy competition and assist local farmers in growing their businesses, to share our knowledge and expertise to make the region more appealing for future investment.

Scan the QR code for video insights into our farm activities or click here:





OUR PRODUCTS



Overcoming volatile markets and sales challenges



We grow more than 10 principle crop species on our farms, from woody perennials such as coffee and cacao to spices such as cardamom to forestry species for timber production. All our agricultural products are produced using regenerative farming practices and are marketed directly through our own sales channels.

The year 2021 was characterized by various challenges not only for our operations but also for our sales. These are examined in more detail by Jaume Martorell Mir, Head of Sales at 12Tree. In addition, Jaume describes our strategy to ensure fair and cost efficient distribution despite these challenges.

What is the current market context for 12Tree's products?

Since the beginning of the pandemic, international trade has changed dramatically, especially at the logistics level. Lockdown policies interrupted many supply chains at the beginning of the pandemic.

Simultaneously, consumer behaviour moved considerably towards online channels. This has created imbalances in global shipping that are highly complex. In effect, freight rates tripled and, in some cases, even increased up to tenfold. Moreover, the Ukrainian crisis had an immediate effect on global food markets. In particular the imbalances in fresh fruits markets, in our case the banana market, have affected 12Tree. Large quantities of bananas are normally exported to Russia and Ukraine and the sudden inaccessibility of these countries has led to a destabilization of the market. The surplus of bananas has resulted in a dramatic drop in global prices. On the other hand, some products have benefited from these market fluctuations. For example, coffee prices have almost doubled. Fluctuations in global commodities do not happen in isolation, and these changes are also due to compounding factors like weather events in Brazil and overproduction in the major supply countries.

How can these complex market fluctuations be addressed?

At 12Tree, we believe that in the face of volatile markets, trade relationships must be consistent, based on long-term alliances in which fair prices reflect the added value of regenerative and sustainable agricultural practices. We aim to adapt our products, and production practices, to the individual needs of our clients to strengthen a dynamic that translates into fair prices for both, producers and consumers. For this reason, we work both with multinational companies that

believe in sustainable production, and with small companies, such as bean-to-bar chocolatiers, that value above all the quality of our fair and sustainably produced cacao beans. Through these direct and transparent trade relationships, we can achieve higher and stable prices for our cacao, which directly benefit our workers in the form of fair payments.

Written by Jaume Martorell Mir
Head of Sales

Chocolate manufacturer La Flor makes exceptional chocolate from single origin cacao beans sourced from 12Tree farm Hacienda Limon

One of our long-term cacao buyers is the chocolatier La Flor. The Swiss bean-to-bar chocolatier manufactures first-class, hand-made chocolate products using exclusively ethically and sustainably sourced cacao beans from small producers which they have personally met. Our team has been pleased to welcome the team of La Flor at Hacienda Limon several times during the past years.

Chocolatiers like La Flor make it possible to achieve fair sales prices that are resilient to market fluctuations. In this way we are able to guarantee fair income for our farm workers that withstand global challenges such as the pandemic. High quality standards are at the core of our cacao production to maintain these vital relationships with buyers. We wanted to know what chocolate manufacturer La Flor values about our cacao and have asked co-founder Ivo Müller, what makes Hacienda Limon cacao special?

“For us, Hacienda Limon cacao is the symbol of Arriba Nacional cacao. The classic, slightly hazelnutty, fruity aroma is very popular with our customers. We are very pleased that 12Tree continues to select and promote the Nacional varieties at this plantation, so we hope that the Heirloom Cacao Preservation Fund will continue to nominate them. Moreover, Hacienda Limon cacao is grown organically, and we meet the same employees at all our visits on site. This speaks for excellent quality with high ethical standards.”

Ivo Müller
La Flor



Certification standards

We transform large scale agriculture towards sustainable and regenerative practices.

Certifications are an integral part of our strategy to make sustainability pay and to educate consumers about the sustainability work that is done on the farms. Depending on the crop and site conditions, our farms are certified with a variety of different labels. The most widely recognized are presented below:



GLOBAL G.A.P. is a world-renowned certification standard of sustainable agricultural production. It aims to promote good agricultural practices by minimizing the harmful environmental impacts of agricultural activities, reducing the use of chemicals, and ensuring responsible management of worker health and safety and animal welfare.



THE RAINFOREST ALLIANCE certification stands for environmental protection, social justice, and the economic viability of farming communities. It aims to achieve continuous improvement in the participating companies towards more sustainable agriculture through social, economic, and ecological standards.



FSC STANDS FOR «FOREST STEWARDSHIP COUNCIL®». It is an international certification system for more sustainable forest management. FSC certification is awarded to forests and plantations that are managed, among other things, according to stricter ecological and social principles. This is intended to help ensure that forests can be preserved in the long term.



THE EU ORGANIC LABEL is the official European Union certification for organically produced agricultural products. The EU's organic farming legislations are designed to provide a clear structure for the production of organic products across the EU. This is intended to meet consumer demand for trustworthy organic products while creating a fair market for producers, traders, and marketers.



THE USDA ORGANIC LABEL is regulated by the United States Department of Agriculture. The USDA governs the standards for each farm/unit that wishes to sell an agricultural product as organic. This involves both the cultivation, harvesting and all processes involved.



THE VERIFIED CARBON STANDARD (VCS) is the world's most widely used voluntary GHG program. Once projects have been certified against the program's rigorous set of rules and requirements, project developers can be issued tradable GHG credits called Verified Carbon Units (VCUs). VCUs can then be sold on the open market and retired by individuals and companies as a means to offset their own emissions. All VCS projects are subject to desk and field audits by both qualified independent third parties and VCS staff to ensure that standards are met and methodologies are properly applied.



THE CLIMATE, COMMUNITY & BIODIVERSITY STANDARD (CCB) is an additional certification to the VCS, conferred to land management projects that deliver net positive benefits for climate change mitigation, for local communities and for biodiversity. The CCB Standards can be applied to several types of land management projects, including projects that reduce greenhouse gas emissions from deforestation and forest degradation or from avoided degradation of other ecosystems, and projects that remove carbon dioxide by sequestering carbon (e.g., reforestation, afforestation, revegetation, forest restoration, agroforestry, and sustainable agriculture).



Short introduction to cacao

While chocolate used to be a luxury good for the elite, today - in various forms - it is hard to imagine a supermarket without it. Whether as a soothing hot drink, as a spice or as a sweet chocolate bar between meals - cacao is popular all over the world, with a global consumption of almost 5 million tons of cacao beans per year. But where does our cacao actually come from and how does it get to our supermarket?

The cacao tree is called *Theobroma Cacao L.* in Latin and belongs to the mallow family. This plant family has been around for millions of years. The cacao tree has its origin in Central America, around present-day Mexico, Guatemala and Honduras. The ancestors of the Aztecs and the Mayas cultivated cacao from around the 4th century AD. From ground cacao, flavored with chili, vanilla and honey, the Aztecs prepared the first known drinking chocolate, the «Xocolatl» and they also used the cacao butter as medicine or for cosmetic purposes. Cacao beans were so valuable at that time that they were even used as currency!

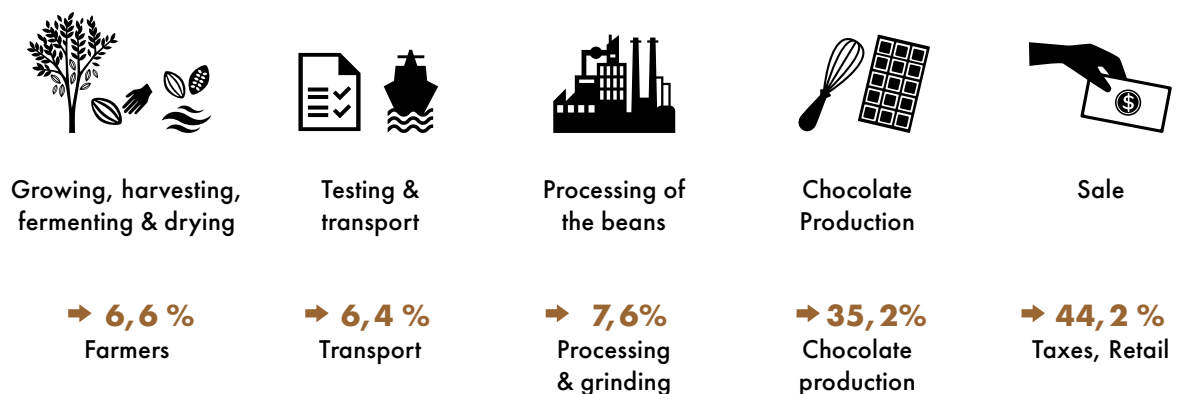
Today, the evergreen tree is cultivated in the tropical regions of Africa, Central and South America and Asia, as the humid climate of the tropics offers optimal growing

conditions. Worldwide, cacao is cultivated by more than 5 million smallholder farmers. More than 65 % of the global harvest comes from West Africa, particularly from the Ivory Coast and Ghana, but Ecuador, Cameroon and Indonesia are also important growing countries¹⁴.

From bean to chocolate

The supply chain of the popular raw material is complex. The fruits of the cacao tree contain seeds that are coated in a viscous, sour pulp. These seeds resemble thick white beans, which is why we know them by the name "cacao beans". To achieve the final product, cacao beans are first released from the pulp, then fermented, and then dried. These steps, in addition to the specific variety of the cacao plant, influence the flavor of the chocolate products. Further processing of the dried cacao beans often takes place in the consumer countries rather than in the growing regions. The cacao beans are processed into preliminary products (such as cacao liquor, butter, and powder) for chocolate production. This is followed by the journey to the supermarkets and from there to the consumers¹⁵.

THE LONG WAY FROM A CACAO BEAN TO A BAR OF CHOCOLATE¹⁶



AND WHO GETS WHAT % OF THE FINAL SALES PRICE*

*per ton sold of cacao sold



Despite the high global demand for cacao products, little of the value added reaches its source. Many cacao-growing families are poor, and continue to struggle to meet basic needs. In addition, forests are often cleared to create more cultivation area. Worldwide, cacao is one of the biggest drivers of agricultural deforestation and an important contributor to ongoing climate change¹⁷.

Cacao and climate change

The traditional way cacao has been grown is not only harmful to the climate but is also vulnerable to the effects of climate change. According to Researchers from the University of California at Berkeley, the cacao tree is particularly threatened by climate change because it has very specific growing conditions. The tropical tree needs warmth, but not more than 35°C. It also needs high humidity and sufficient rainfall. All these factors will no longer be guaranteed in the growing regions by 2050 as climate change progresses. Climate models predict that many of the regions currently growing cacao will no longer provide the necessary conditions by 2050- resulting in a sharp decline in cacao production from 2030 to 2050. This not only threatens the availability of chocolate and other cacao-based products. It also threatens the livelihoods of smallholder farmers who provide the bulk of the world's production¹⁸.

12Tree believes it has identified a successful model to grow cacao sustainably at scale. Our approach defines the current conventional wisdom that using sustainable practices is at odds with the production of large-scale, high quality cacao that achieves good prices. To address this, we've consolidated the cacao supply chain to make it more transparent and to enable a higher income for the farmers. Additionally, we operate on a large scale using sustainable practices. With this approach, we are pioneers in the market.

However, we are not the only ones who recognize that the value chain of the chocolate industry has to become more sustainable. One of the biggest players in the market, the chocolate manufacturer Mars, has also recognized this and started a joint project with us with the aim of producing climate smart cacao beans. In the following interview, you can read about the goals Mars is pursuing with our Andean Cacao project and how it fits into the company's sustainability strategy.



Andean Cacao: Mars Wrigley's mission for a climate-neutral cocoa bean



Farm visit with Andean Cacao

In 2021, Mars Wrigley announced a joint climate-smart venture, Andean Cacao, with 12Tree and ECOM, one of the world's largest suppliers of sustainable cacao beans.

Andean Cacao's vision is to catalyze an industry shift, transforming formerly degraded land into a scalable, sustainable production model. The initial target for the venture is to regenerate 2,000+ hectares of pastureland in Colombia. We had the honor of interviewing Matthew Moudy, who leads Mars Wrigley's Modern Sustainable Cocoa Farming strategy. He leads the initiative on

Mars Wrigley's side and works closely with the Andean Cacao team on a weekly basis. During the interview, we talked about the company's overall sustainability strategy as well as their perspective and motivation to support Andean Cacao.

How does Mars Wrigley define sustainable cacao production?

The way cacao beans are produced today holds many challenges for us humans as well as nature. We aim to reshape the future of cacao by creating an inclusive, modern and sustainable supply chain. This means creating a cacao sector where human rights are respected, the environment is protected and everyone, especially cacao farmers, has the opportunity to thrive.

It is still a fact that farmers, especially smallholders, are the most challenged actor in the food supply chain. They bear all the production risk, but often do not earn enough to provide a decent income. We want to ensure that supply chains are built in a way that allows people to thrive. And this goes beyond ensuring proper incomes and premiums, but

also by supporting them to increase their productivity, and developing alternative large-scale farm models where farming communities can find decent job opportunities and wages.

For us, protecting the planet goes far beyond meeting the bare minimum, such as no water and air pollution. It's about reducing carbon footprint and stopping deforestation in our supply chain. Mars is a member of the World Cocoa Foundation's Cocoa & Forests Initiative and a signatory to the CFI commitments to halt deforestation and restore forests in the global cacao supply chain. Our aim is to achieve a deforestation-free supply chain by 2025 and to further achieve carbon neutrality by 2050.

And how does Andean Cacao fit into this strategy?

Andean Cacao is our flagship project, in which we want to catalyze an industry shift, to prove how climate-smart cacao production can work at a large-scale. We made some big bets, transforming the cacao sector sustainably towards carbon neutrality, thriving farmers and all involved stakeholders of our supply chain... With Andean



Cacao we can prove that such a transition is possible. The project is still in the transformation process, regenerating formerly degraded cattle grazing land into a highly productive, sustainable farm with the goal of delivering quality carbon-neutral cacao beans. The project seeks to improve carbon sequestration, soil health, and biodiversity, create living-wage job opportunities, and support neighbor communities.

Another important aspect here is our land footprint. As our business continues to grow, we faced the question of how we ensure that we are not using land for cacao production that local people need to grow food in order to survive. Therefore, we made the commitment not to take up any more land in the supply chain. As part of Mars journey to become Net Zero by 2050, we have committed to have

no greater land footprint in 2050 than we had in 2015 and foster smart-ag, regenerative and resilient practices in place within our supply chain. In order to achieve this, we need to be more productive on the land we already have - once again this is where Andean Cacao comes in.

What impresses you most about the project?

Every day we learn something new. What I really admire about Andean Cacao CEO Xavier Sagnieres and his team is that they are proactive instead of reactive. Each new insight is taken in and serves as the basis for the next decision or strategy adjustments. As a result, the project does not stop but gets better each year. The scale we are at today is tiny in comparison where we will be, so being able to make these learnings is super important.

And second, Andean Cacao is showing that it works, that climate smart agriculture enables high productivity while continuously improving the health and well-being of the environment, the soil, and the people.

Short introduction to coffee

Today, it is impossible to imagine our daily life without coffee.

It is one of the most popular drinks around the globe. Next to water and tea, it is the most consumed liquid in the world. Coffee is also a valued commodity and a key element in the economies of many countries.

From the past...

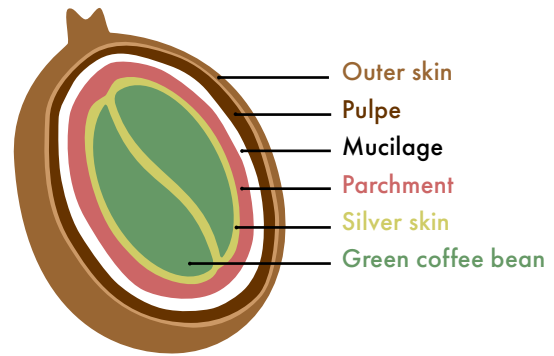
But where does our global coffee consumption originate? According to a legend, coffee was discovered by an Ethiopian goat herder who quickly noticed the stimulating and refreshing effect the beans had on his goats. From then on, locals used it as an offer in communal ceremonies and to make use of its energizing effects.

From Ethiopia it is most likely that coffee next reached Arabia through traders in the 14th/15th century. The term «coffee» is derived from the Arabic «kahwe» or «qahwa,» which means vitality or strength. From there it reached finally found its way into Europe, so that already in the 17th century the first coffee houses opened in Venice. Once it arrived in Europe, coffee's triumphant march was unstoppable. In the early 18th century, Europeans began planting coffee trees in their tropical and subtropical colonies in Africa and Latin America¹⁹.

... To the present

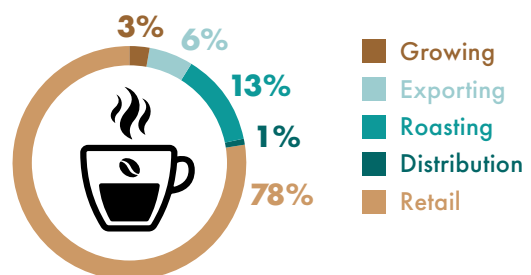
Nowadays coffee is, next to crude oil, the most traded product worldwide. It is traded in higher volumes than cotton, wheat, corn, or sugar. 90% of the world's coffee production takes place in tropical countries lying in the so-called coffee belt, which extends around the globe between latitudes 20 degrees south and 20 degrees north. In these regions, coffee thrives in a frost-free, dry and humid climate. About 70% of the world's coffee is grown by 7 million farmers on farms of less than 5 hectares of land. Brazil is considered the largest coffee-growing country, with a total export volume of around 2.4 million tons in 2019. The world's major coffee consumers are Europe and North America. Almost a trillion cups of coffee are consumed worldwide every year. The European Union has one of the world's highest average annual per capita consumptions at just above an estimated 5 kg of coffee per person a year^{20,21}.

ANATOMY OF A COFFEE CHERRY



Although consumer demand for coffee continues to rise, poverty rates in coffee-producing countries are stagnating. How can this be? – Since the late 1980s and the failure of the last international coffee agreement to regulate world trade, the coffee industry has been characterized by more volatile prices, lower incomes for producers and a concentration of power in favor of green coffee traders, major international brands and retailers' own brands. This goes hand in hand with the fact that, most of the value creation takes place in the consumer countries and not in the growing countries as most of coffee processing takes place outside the coffee belt around the equator. Instead, it travels many kilometers to a roasting plant in North America or Europe to become the product we know from the shelf. There are also many intermediaries in the supply chain who also want a share of the profits and thus further depress the prices for so called green coffee. Consequently, growers have to deal with highly volatile purchase prices, with a simultaneous increase in operational costs for labor, fertilizer, and machinery²².

SHARE OF MARGIN IN THE COFFEE SUPPLY CHAIN²³





Another challenge for the farmers is that coffee plants are highly sensitive to climatic changes. Arabica coffee has been especially affected for some years by rising temperatures and changes in rainfall due to climate change. This leads to uncertain yields, losses due to pest and disease infestation, and difficulties maintaining quality. According to recent research, 50% of the world's arable land suitable for coffee could be lost by 2050 if decisive action is not taken to combat climate change. An example is Brazil, where the expected harvest was recently drastically reduced by long droughts followed by severe frosts. This has driven up world market prices but has not positively changed the profit margin for farmers²⁴.

In light of this situation, many companies, especially industry leaders (Nestlé, Starbucks, JDE, etc.), as well as NGOs have launched local action programs to limit the negative effects of climate change and to improve the situation of producers, including adhering to and incorporating certifications and/or independent seals. In addition, consumer demand for certified coffee is growing and the market for sustainable coffee is expanding. However, there is still much to be done to establish truly sustainable and equitable coffee value chains that also benefit farmers. 12Tree is aware of these challenges and, through its farms, attempts to have a strong impact in the sector and to provide a model of a sustainable and profitable coffee value chain.



CHIMELB
GUATEMALA
4693 ha

DEFINITION: "Natural coffee" (unwashed) refers to coffee dried without removing its skin and washing its mucilage. It is the oldest known method for preparing beans.

DEFINITION: "Washed coffee" refers to coffee that is dried after removing its outer skin, and "washing" off its mucilage.

Chimelb: Cultivating coffee sustainably at high altitudes

Carlos Torrebiarte is the director of operations at Chimelb Farm in Guatemala. He has more than 20 years of experience in coffee cultivation and regenerative agriculture. Together with his team of about 174 permanent employees, he grows four different cash crops in intercropping systems on 1,738 hectares.

How is coffee cultivated on the Chimelb farm?

We cultivate Arabica coffee on around 580 hectares of Chimelb farm. Chimelb, with its vast landscape of rolling hills, has a variety of microclimates in a relatively small area because of the constant changes in elevation. The Arabica coffee is grown at the farm's highest elevations, on the top of these hills, surrounded by areas of natural and commercial forests. These higher altitudes provide the conditions necessary to accentuate the natural flavors of different arabica coffee varieties, improving their cupping quality. The coffee is grown under direct sunlight to increase its metabolism and productive potential, using grass cover crops to prevent erosion and improve physical, as well as microbiological qualities of the soil. The natural and commercial

forests that we protect and manage, and that stretch across the coffee plantation, act as natural barriers against pests and preserve the biodiversity unique to the region.

Producing coffee is a long-term commitment that requires a lot of hard work and determination. Unlike annual crops that are planted and harvested in the same year, coffee is a perennial crop with an expected life cycle of around 20 years. It has a long investment phase, as three years of careful management of young plantings must pass before a coffee plant is ready to produce its first important harvest. Five years after establishment, a coffee plant reaches its productive potential, and throughout the rest of its life, it is managed to produce in on and off cycles according to its natural biannual production cycle or through management practices such as pruning.

In Chimelb, as is the case in most Guatemalan coffee farms, the coffee is harvested manually. Hundreds of collaborators from neighboring communities such as Cojaj and Campur are hired during the harvest season, bringing much needed economic development opportunities for the region. Unlike perhaps all farms

in the region, in Chimelb both ripe and green cherries are harvested together to simplify the task for the collaborators, allowing them to be more efficient.

So, after harvesting the coffee beans, what do you do with them?

All the field work is just the start of all the processes that must be completed so that a cup of coffee is ready to drink. There are different ways to complete this process but for Chimelb, after harvest, the next step in the process is the cherry coffee transformation in the wet mill. The wet mill gets its name from the fact that it uses water in one of the steps in the process to produce what is known as "washed coffee". Washed coffee only makes up approximately 50% of all coffee produced worldwide, but the great majority of the premium quality specialty coffee is washed.

The wet milling process is a science as well as an art, with many factors such as time, drying temperature, and even anaerobic fermentation processes that must be considered to produce the best coffee possible. For Chimelb coffee, the process starts by sorting the ripe and green cherries by color and

density. This results in three different channels where the coffee is processed, since the different colors and densities produce differing qualities of coffee. The ripe and dense cherries are transported to a depulper, where the pulp or skin of the cherry is removed to produce a wet parchment coffee. This wet parchment contains mucilage - or sugar compounds - in the outer layer of the seed, that go through a fermentation process that help the coffee achieve a better and more uniform flavor profile. Once it is ready, this wet parchment is washed to remove the mucilage, and transported to "guardiolas", or rotary driers, so that it is dried into dry parchment. This dry parchment goes through one final preparation process, called dehusking, in the "dry mill", and is then ready for export, roasting, and consumption.

The green and lower density cherries go through a different process, known as a natural preparation. Unlike washed coffee, this type of coffee is dried without removing the outer skin. Therefore, its mucilage is not removed through the washing process. This process has to take place for the green and lower density cherries since the composition of the skin of these kinds of coffee makes it harder for it to be removed. Still, the quality of naturally processed coffee can be just as good as washed ones.

One aspect of the wet milling process for Chimelb coffee that we are very proud of is that it uses much lower quantities of water compared to the industry standard. All the by-products from the process, such as the removed skin, are also further processed and can be used throughout the farm as fertilizer.

What are currently the main challenges for coffee production at your farm?

One of the main agronomical challenges we currently face is the increasing pressure from pest and diseases. Diseases like leaf rust have continuously intensified and become harder to combat through the years. In Chimelb, we are tackling these issues through the regenerative management practices used in the farm, such as the forestry buffer zones used in the system or intercropping with grass cover crops or other cash crop in the case of Robusta coffee. These practices lead to a more diverse plantation that more easily combats the spread of pest and diseases.

Another important challenge is the increase in the amount and intensity of rainfalls, which can be especially risky in mountainous landscapes such as those found in Chimelb. Regenerative growing practices, such as the grass cover crop, are once again our most important tools to prevent the problems, such as soil erosion and nutrient runoff, that could result from excessive rainfalls if the ground was left uncovered.

Despite these important challenges, I believe that the biggest challenge that coffee currently faces lies on the economic side of the industry. Coffee prices have remained stagnant throughout the last decades, while the capital necessary to invest and manage a farm keeps increasing. Crop diversification, regenerative practices and certifications such as Rainforest Alliance are all tools that we use in Chimelb to address this challenge. However, all these are very capital-intensive processes, especially in the short term. As a result, many coffee farmers in Guatemala and throughout the world, have had no choice but

to abandon their way of life, as younger generations no longer want to be involved in a business that promises few returns despite the tremendous work that is involved in it.

Coffee has a tremendous potential to be an engine for economic and social development in coffee producing countries, but as long as the price situation does not improve, I see it very hard for producers to implement all the management practices necessary to be sustainable.

Short introduction to coconut

It is not entirely clear where the coconut originated. It is assumed that the first coconut palms grew on the islands of the Melanesian archipelago in the southern Pacific.

Since coconut palms are often close to the water, it happens that ripe fruits fall down and are carried away by the waves. Coconuts are lighter than water and therefore float on the surface for long distances. Since their waterproof shell keeps them for several months, such a journey cannot do them much harm, and so it is quite possible for them to become stranded hundreds of kilometers away, where they germinate and grow into a coconut palm themselves.

For about 3,000 years, coconut palms have been deliberately cultivated by humans. Nowadays, coconut oil is experiencing a boom. After long being considered an exotic oil, it is now conquering the supermarkets of Europe and North America. Coconut oil is not only offered as particularly healthy for food and cosmetic products, but also as an alternative to palm oil. But while sustainability standards nowadays exist for palm oil production and the private and public sectors are committed to their further development, the coconut sector is still less advanced in this respect.

Today, coconut palms grow throughout the tropical belt. The main areas of cultivation include Indonesia, the Philippines and India. This was because the colonial powers that formerly ruled these countries pushed cultivation there, first for the ropes for sailing ships that could be manufactured from the fibrous husk, and later for coconut oil²⁵.

Coconut supply and demand do not match

Unlike palm oil, the coconut sector is not dominated by large plantations. The current global production volume of 60 million tons is mainly produced on small farms. The high global demand, as a result of continuously increasing consumption of coconut products in food, cosmetics and pharmaceuticals, however, contrasts with the existing small-scale cultivation structures, complex value chains and obsolete tree stocks. There are several reasons driving a decline in production, amongst them antiquated and inefficient production practices, disaggregated supply chains, the impacts of climate change, and global market volatility^{26 27}.



A major problem is that coconut palms pass their peak production after 50-60 years and then bear fewer and fewer nuts. Globally, half of the coconut trees are already considered too old. The main reason for that is the lack of economic incentive for the farmers to invest in new trees and plantations, especially since a coconut palm does not bear fruit for several years²⁸.

The 12Tree farm Ambrosia in the Dominican Republic produces coconuts in an agroforestry system together with different crops. In the following interview, Daniel Dalet, gives us insights on how this works for him and his team.



Coconut palms of the beach close to Anilao Island



AMBROSIA

DOMINICAN REPUBLIC

2,100 ha

Ambrosia: Coconut production in species-rich agroforestry systems

Daniel Dalet, the president of the operator company 12Tree Organics and manager of the Ambrosia farm in Nagua, Dominican Republic is a specialist in coconut farming and processing with more than 12 years of experience. We had the chance to ask him some questions regarding his passion for sustainable agriculture and coconut production as well as challenges they tackle on the farm.



Daniel, please tell us, why coconuts? What makes them special?

Coconut palms are beautiful crops with many different uses. This is what makes them so special, a simple plant meets many different consumer needs at the same time. From lifestyle products, to food, to industrial fibers. Another important advantage, in my opinion, is that the management of the coconut palm is comparatively simple. It is very resistant to extreme weather events, such as hurricanes. If continuous irrigation is provided and nutrients are supplied regularly, the coconut palm is very resilient.

Besides, coconuts present a very good business opportunity. The coconut market is severely underserved. It grows by rates of more than 10% every year whereas the supply rises just by 2%. This results in a huge potential for planted coconuts. And additionally, as a sustainable entrepreneur, I'm driven by impact. Not only social but environmental impact. We plant the coconut palms in regenerative agroforestry systems, which continuously improve the soil, the overall biodiversity and provides permanent jobs for many people in the regions. Such systems are

more resilient to tackle the future challenges arising from climate change. Looking at the problems we have created through conventional agriculture, I see a future for sustainably grown coconut palms.

That brings me directly to my next question: How are coconuts grown at the Ambrosia farm?

Coconuts are the main cash crop on the farm. They are the central element of all our plots. After an initial growing period in our nursery, the young seedlings are planted in an eight-by-eight triangle. In between they are intercropped with cacao or plantain, while the rest is covered with a dense green groundcover, also known as cover crops. Coconuts are the perfect element for such diverse systems, since they don't take a lot of space due to their height, while they enrich the soil and act as shading elements within the system.

The coconut palms on our farm have a lifespan of about 15 years, after which we replant, otherwise they are too large for harvesting. Generally, harvesting coconut palms is not easy, so we have specially trained field workers. After harvesting, we remove the



“Research has shown that the soil is alive. Therefore, we have to treat it like a living organism. Through conventional agriculture, we continue to destroy it, and this disrupts the entire carbon cycle of the planet. Climate change is the direct consequence of this and thus the big problem of how to feed the growing world population with ever poorer harvests.”

Daniel Dalet

husk of the coconut, which is the soft fibrous shell. We granulate this into a powder, which we spread as organic fertilizer on all our fields. The coconut shell with the valuable copra is sold on the market to processors as well as exporters.

Why do you think the market is still so undersupplied with coconuts, although demand is constantly increasing, and cultivation should therefore be very profitable?

I see the biggest hurdle in coconut production at the very beginning of the investment. The

initial investment is high because you have to invest time and inputs in the crop for six years to get a productive coconut palm. In addition, everything depends on genetics. It is not easy to get high-quality seeds, and that makes large-scale investments even more difficult and risky. Only when the coconut palm bears fruits – you can tell if the quality of the seed were good or bad, so only after 5-6 years of cultivation. Therefore, you need experienced people on board if you want to get into this business. Also, you need a lot of space, flat land and continuous water supply to grow coconut palms properly.

But if all these conditions are in place, if you have the land, the money and the right management, you can make it profitable through sustainability.



OUR CLIMATE



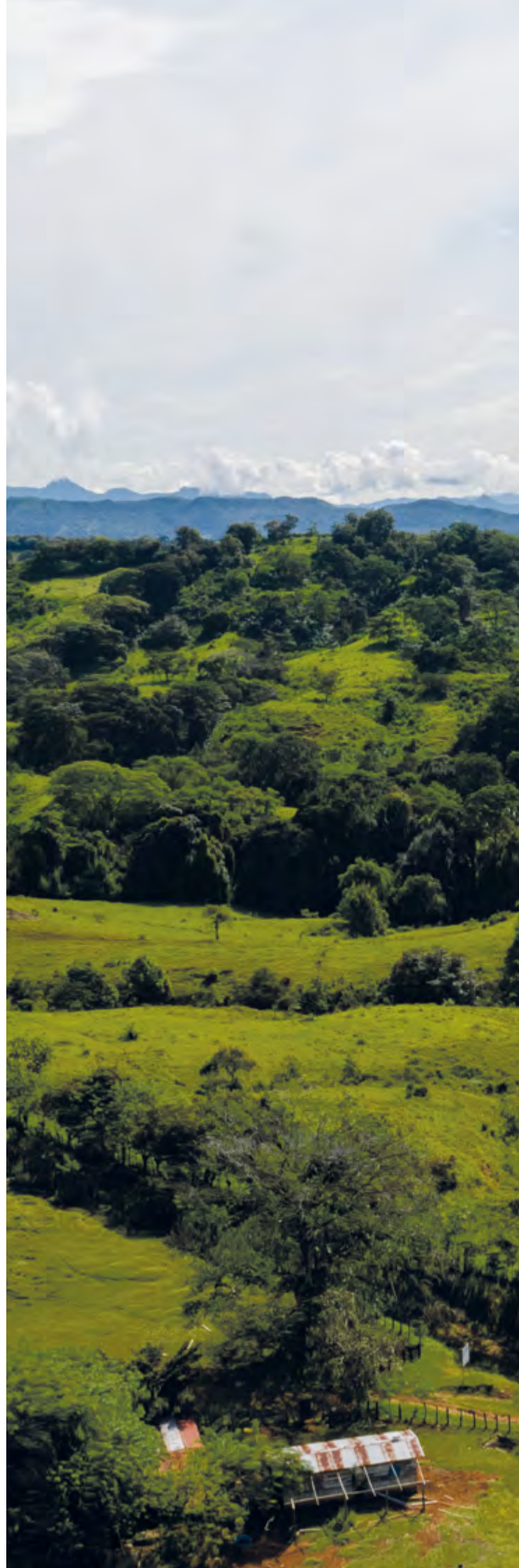
Introduction

Today a growing global population is driving up the demand for food, yet production is struggling to keep up with this demand as crop yields level off in many parts of the world, and natural resources—including soils, water, and biodiversity—are now also stretched dangerously thin.

Further complicating this challenge is agriculture's extreme vulnerability to climate change, with many of its negative impacts already being felt in the form of increasing temperatures, weather variability, invasive crops and pests, and more frequent extreme weather events.

Unfortunately, this problem also works in reverse. Conventional approaches to agriculture act as major contributors to our climate crisis. Unsustainable land use activities -such as deforestation, and overgrazing- and degradative agricultural practices -such as intensive soil tillage, monoculture cropping, bare fallowing, and heavy reliance on chemical fertilizers and biocides- have considerably altered our terrestrial ecosystems and now play a key role in the global climate system. It is estimated that conventional food and agriculture systems currently generate 19–29% of our total greenhouse gas (GHG) emissions²⁹.

12Tree, through its various initiatives, is actively working to reverse these trends and to change agriculture from being a culprit, to being part of the solution. Rather than function as a source of carbon emissions, agriculture under our auspices is quickly becoming an effective carbon sink. At both the regional and global levels, a growing body of scientific literature is confirming the potential that our particular approach to regenerative and climate-smart agricultural practices can play in sequestering carbon and helping to mitigate climate change while making croplands more productive and resilient. Moreover, these approaches have the potential to put us on track for achieving SDGs by halting and reversing land degradation (SDG 15), ensuring sustainable production (SDG 12) and reducing greenhouse gas emissions (SDG 13). In more general terms, we are spearheading the transition towards implementing better farming practices at scale that will reduce GHG emissions, store additional carbon in soil and woody plants and deliver other important environmental and health co-benefits.





Nature Based Solutions

At the heart of almost every discussion of climate change, there is carbon.

It is now known that it has steadily accumulated in our atmosphere— produced primarily by the burning of fossil fuels — and if left unchecked, will continue to lead to catastrophic consequences for life on Earth. Experts agree that humanity’s first response to the carbon crisis should be to produce less emissions; yet to improve our chances of avoiding the worst consequences of climate change, we also need to begin removing excess carbon from the atmosphere. This can be achieved by sequestering carbon and locking it away in rocks, forests, and soils.

NBS to climate change involve conserving, restoring, or better managing ecosystems to remove carbon dioxide (CO₂) from the atmosphere. These ecosystems reduce climate change by capturing CO₂ from the air and sequestering it in plants, soils, and sediments. They can also provide a wide range of other important benefits, such as cleaner air and water, economic benefits, and increased biodiversity.

Some NBS, such as halting deforestation, serve mainly to prevent greenhouse gas emissions. Others, such as regenerative agriculture and reforestation, actively remove CO₂ from the atmosphere. This makes them a form of carbon removal. 12Tree is now employing and promoting both types of these nature-based solutions to change the way plantation forestry and agriculture are practiced today.

DEFINITION: Reforestation vs. Afforestation

Reforestation and afforestation are two of the leading nature-based solutions for tackling the effects of climate change. The IPCC defines reforestation as “an establishment of a forest cover in a location where the forests have been cleared in the recent past, usually to repurpose the land for activities like agriculture or mining.” Afforestation stands for the establishment of forests where previously there have been none, or where forests have been missing for a long time.



Certifying Andean Cacao for community, climate & biodiversity impact

Andean Cacao's farm is a one-of-a-kind project that is generating considerable benefits and impacts for a wide range of stakeholders.

The farm is currently regenerating over 2,000 hectares of formerly degraded cattle grazing land in Colombia into a highly productive, sustainable farm with the goal of delivering quality carbon-neutral cacao beans. While doing so, the project is not only working towards improving the carbon sequestration potential and footprint of the farm, but also generating benefits for soil health and biodiversity, as well as creating living-wage job opportunities, and critical support for neighboring communities.

The farm is the latest step in a recently announced joint venture between 12Tree and Mars Wrigley, and forms part of the latter's journey through its Cocoa for Generations strategy to build a modern, inclusive, and sustainable cacao supply chain. It shows a continued commitment to trial new climate-smart and modern agriculture solutions, by focusing on three areas of impact: creating healthy soil while capturing carbon and boosting biodiversity; improving livelihoods and community resilience; and exchanging scientific knowledge and cacao agronomy innovation to increase productivity.

One of the ultimate goals for Andean Cacao by end of 2022 is to have the farm's positive social and environmental impacts certified by an independent third party against the Verified Carbon Standard (VCS) and Climate, Community and Biodiversity (CCB) Standards.

Since its launch in 2006, the VCS has grown into the world's largest voluntary carbon credit program, registering over 1,700 carbon reduction projects worldwide that have reduced or removed more than 800 million tons of CO₂ equivalent from the atmosphere. The CCB Standard in turn helps differentiate and identify projects that simultaneously address climate change, support local communities and smallholders, and conserve biodiversity.

12Tree and Andean Cacao have selected Terra Global Capital as our ideal carbon development partner for this venture. Terra Global is a global leader in sustainable forest and agriculture program development and land-use greenhouse gas quantification and finance.

The teams from 12Tree, Andean Cacao and Terra Global are currently working collaboratively on all aspects of project development from field data collection to the incorporation of 12Tree requirements as investors, to Mars' goals to reduce emissions through their supply chains. At the moment, teams are busy carrying out all of the respective field measurements as well as setting up the required monitoring and impact evaluations systems. To date, the initiative has arrived at the ideal combination of available methodologies, as well as a number of supporting tools, in order to best quantify and verify the additional emission reductions and removals that the farm operations will achieve, and that will ultimately be used for insetting or offsetting purposes.

Creating carbon credits

12Tree has selected Terra Global Capital as our ideal carbon development partner to help bring our portfolio of farms up to certification standard.

Founded in 2006, Terra Global is a woman-run, women-owned for-profit social enterprise, and small business, whose mission is to facilitate financially, socially, and environmentally sustainable landscapes. In May of this 2022, we had the privilege of interviewing Leslie Durschinger, CEO of Terra Global, and Carolina Oleas, Project Manager and Ag Specialist, about the nature of the certification work we are conducting with their aid.

It's been said that truly additional and permanent storage of carbon may often be at odds with other financial considerations that govern how farmland is managed. To what degree do you agree or disagree with this statement?

This statement reflects the belief that adoption of carbon positive growing systems and management practices will reduce yields thus having a negative financial impact on profits. But in many cases, the opposite occurs particularly when you look over the long-term. Comparing agricultural practices focused on maximizing short-term yield to the adoption of long-term carbon positive farming often show that later has lower costs, lower risks, and higher productivity, plus the added value of carbon revenue. Integrative carbon positive systems focus on components such as soil health and fertility which are prioritized to build and maintain a long-term productivity of the farm. The benefits of the increase of organic carbon in the soil are noticeable in the long run, thus it is important for farmers to have practical and accessible technologies to measure, monitor and

observe the changes of the carbon in the soil and reduction in nitrous oxide, plus the continuous technical support during the transition process so farmers understand the carbon cycle and the possible effects on their crops and their profits. Through adoption of sustainable carbon positive practices, farmers can often increase their long-yield and crop revenue while lowering costs and reducing risk through building more resilience farms.

How do you think Terra's particular approach to the design of our 12Tree projects can help differentiate our carbon credits from others in the marketplace?

Terra Global provides continuous technical support to the projects and the staff on the ground for capturing the required data and quantifying the full range of carbon pools that produce reductions and removals from the sustainable agroforestry systems being promoted by 12Tree projects. This is done through in person and virtual trainings, building capacity, and providing on-going technical guidance on from everyday farm decisions regarding practices to monitoring to capture the data needed for market standard validation and monitoring to verify high quality multiple benefit emission reductions and removals. Through working in partnership with 12Trees with their expertise in agronomic management and Terra Global's experience in producing high quality credits under carbon market standards, the teams carbon credits will be high environmental integrity and include the certification of the community benefits that are part of all of 12Trees projects.

What have been some of the main obstacles preventing the agriculture/food production sector from entering the carbon offset market, and how can we incentivize more farm operations to access carbon finance?

Some of the factors that have affected the increase of agricultural/food production projects to enter the offset conservation are:

1. SIZE OF THE AVERAGE FARM PRODUCTION

81% of global crops are grown on farms less than 199 hectares. Big farms have a minority share in crop production, only contributing to 5% of worldwide crop growth. This shows that agricultural production is divided into small farm areas, making it difficult to consolidate the adoption of practices and less likely that small farmers will have the capital to invest in a carbon certification. One of the alternatives that have supported small farmers' certifications are being part of grouped projects, where farms/land that have implemented similar agricultural practices can get certified as a group, facilitating the adoption of practices and credits in bigger areas.

2. LACK OF KNOWLEDGE ON THE STANDARDS & PROTOCOLS

This is a limiting factor, as information about standards is publicly available, but farmers do not know how to access it. It is important to continue the education process to make all actors involved, more familiar not only with the standards available but also with the processes to follow to get credits and maintain them.

Closing the gap between offsetting and insetting

Beyond certification under both the VCS and CCB standards, Andean Cacao has also been invited to participate in the Verra standard's Supply Chain/Scope 3 GHG Pilot Project Initiative.

To limit global warming to 1.5°C and avoid the catastrophic impacts of climate change, it is now understood that companies will need to reduce their emissions rapidly and considerably. For most sectors, this means directly abating their Scope 1, 2 and 3 emissions³⁰ by approximately 80-90% by 2050. According to the "Mitigation Hierarchy"³¹, which prioritizes the elimination of one's emissions first and foremost, such initiatives will require companies to prioritize abatement over the purchasing of carbon credits, thereby increasing interest in Scope 3 interventions significantly since its these types of interventions that will be the ones that can be used towards abatement targets, or insetting.

At the same time, carbon markets are also rapidly expanding. As is the case of Andean Cacao, most of the credited activities are located within larger corporate supply chains, such as an agricultural land management project implemented on farms that supply a food retailer. As a result, the risk of double-counting project activities as both carbon credits and corporate Scope 3 interventions is growing. To help manage this risk, the GHG Protocol³² is drafting guidance that will likely require companies to adjust their inventories for any carbon credits sold. However, no clear pathway exists to transition the emission reduction and removals generated from carbon credit projects to Scope 3 interventions that can then be counted in a corporate inventory. Consequently, many companies may lose opportunities to reduce emissions in their supply chains and become stuck with emissions that they cannot abate.

As interest in Scope 3 emission reductions grows, demand for greater guidance, infrastructure and standardization also increases. It is for these reasons that Andean Cacao has become a pilot project for the Verra standard's Supply Chain/Scope 3 GHG Pilot Project Initiative. As the world's leading standard for certifying carbon credit projects, Verra is uniquely positioned to explore the potential to apply existing knowledge and infrastructure from the VCS Program to standardize the implementation, quantification and accounting of Scope 3 interventions. Therefore, the greater consortium of 12Tree, Andean Cacao, Terra Global, and Mars Wrigley will now also work directly with Verra to help identify and lead in the advancement of opportunities for standardization and the scaling of Scope 3 interventions across the world.

DEFINITION: A company's emissions are classified into three scopes:

SCOPE 1: direct emissions from company owned and controlled resources that enter the atmosphere as a direct result of a range of activities.

SCOPE 2: indirect emissions from the generation of purchased energy from a utility, mostly consumption of purchased electricity, heating and cooling.

SCOPE 3: all indirect emissions not included in Scope 2, including upstream and downstream emissions. In other words, all emissions related to the company's operations.





OUR BIODIVERSITY



Introduction

Today, biodiversity and agriculture are at odds with one another in several ways.

About half of the world's habitable land is used for agriculture and thus agriculture production is largely responsible for deforestation and the loss of other valuable habitats such as wetlands and grasslands. As a result, food production is responsible for the majority of global biodiversity loss- including as much as 70% of terrestrial biodiversity loss. At the same time food production highly depends on well-functioning ecosystems. Nature provides numerous ecosystem services - such as fertile soils, food, natural remedies, drinking water, and clean air – which in turn regulate the climate. If ecosystems or their components are damaged in the long term, the services provided by nature are at risk³³.

Despite this reality, only recently have science and industry begun to practically consider the role that large scale agriculture can play in restoring biodiversity. Prior approaches to integrate the two typically promoted conservation set-asides adjacent to agricultural and forestry developments. But the conservation paradigm that focuses on setting aside pristine forests while ignoring the agricultural landscape is a failed strategy in light of what is now conventional wisdom in ecology. Some habitats like tropical forests harbor great biodiversity, others, like agricultural systems, less. But in the fragmented landscapes that characterize almost all of the world's terrestrial surface, those habitats that are biodiversity "poor," may be extremely important as passageways for the habitats that are biodiversity "rich." Given the fragmented nature of most tropical ecosystems, agricultural landscapes need to be an essential component of any conservation strategy. Transforming our agricultural systems into biodiverse agricultural landscapes is therefore key to reducing biodiversity loss, mitigating climate change, and ensuring human welfare as it relates to the most basic rights of clean air and water and nutritious food. Hence, our ability to achieve the SDGs will hinge on the protection and restoration of global biodiversity, from ending hunger (SDG 2), to clean water (SDG 6), to reduced inequality (SDG 10). But the process of transforming our

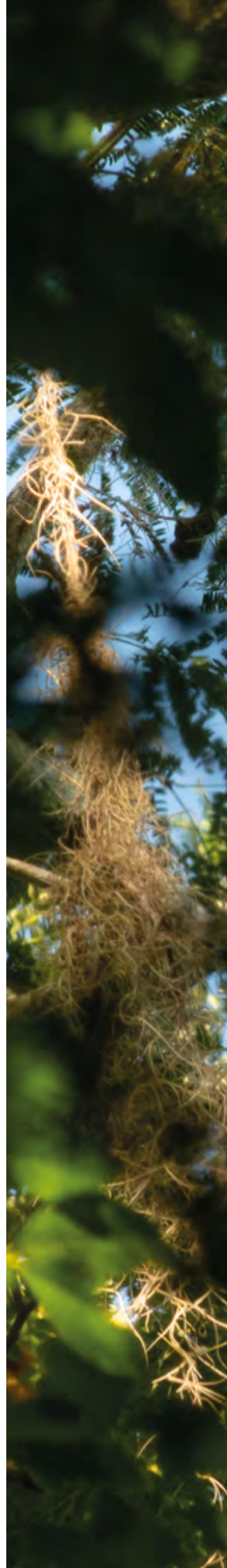
food systems will require, as WWF eloquently puts it, a paradigm shift from intensive commodity production that tries to minimize the role of nature, to "farming with biodiversity to achieve nature-positive production at scale".

DEFINITION: Agroecosystems are defined as communities of plants and animals interacting with their physical and chemical environments that have been modified by people to produce food, fibre, fuel and other products for human consumption and processing.

12Tree's farms are a living testament that large scale, profitable farming can be done in harmony with nature, and that regenerative agriculture can actively conserve and enhance biodiversity and other important ecosystem services. We have adopted a number of strategies to incrementally increase biodiversity on our farms. The most fundamental include practices like delineating and protecting conservation and restoration areas, and introducing multi-tiered, mixed varietals and crops into our productive systems.

12Tree's farms are empirically proving that a collection of biological reserves in a sea of diverse agroecosystems³⁴ managed regeneratively and with diverse vegetation cover is precisely the path forward for restoring global biodiversity through agriculture.

Scan the QR code for video insights into our farm activities or click here:







PLATANERA RIO SIXAOLA

COSTA RICA

298 ha

Platanera Rio Sixaola: Measuring impact in aquatic ecosystems with bioindicators

If we are to truly transition to sustainable food and farming systems, we need to measure our impact.

Rivers are ecosystems that are strongly influenced by their surroundings, and river ecologists have long recognized that rivers and streams are influenced by the landscapes through which they flow. Thus, one way of measuring the impact that our operations are having in the environment is by looking at the ecological health of the rivers and streams that flow through our farms.

Unlike physicochemical analyses, which reflect the condition of the water at the time of sampling (similar to a photograph), biological indicators like fish assemblage, macroinvertebrate benthic community, and condition of the physical habitat, respond to longer term environmental conditions integrating ecological information over time.

The Sand Box River is a tributary of the Sixaola River basin and flows through the western edge of our farm Platanera Rio Sixaola in Costa Rica. This river is in a hotspot of endemism for freshwater fish in the country, so its management is critical for the conservation of the unique aquatic biodiversity of the country. As responsible stewards of the land, we deeply care about how our practices are influencing this important river. Monitoring and interpreting bioindicators require scientific expertise and skills, so we partnered with the River Biomonitoring Program of the ANAI Association from Costa Rica to conduct a relevant study.

They found out that the river is habitat for five freshwater species endemic to the South Caribbean, all listed as Endangered, according to IUCN's Red List (2020). Furthermore, they identified the presence of four species that need to migrate between fresh and brackish waters to complete their life cycle. The presence of migratory species indicate that rivers are freely connected to the sea and maintain good characteristics of habitat and forested riparian zones. Platanera Rio Sixaola is constantly working on improving the water quality through sustainable agriculture practices and to minimize the disturbance of the area adjacent to the river as much as possible.



Biodiversity Hotspots: What are they and why are they important?

Worldwide 36 terrestrial regions are recognized as biodiversity hotspots.

These hotspots constitute the most biologically rich, yet threatened, areas on earth. For an area to be classified as a biodiversity hotspot, it must contain at least 1,500 species of endemic plants found nowhere else on Earth, while having lost at least 70% of its original vegetation³⁵. Once Biodiversity hotspots covered 15.7% of the Earth's land surface. However, 86% of the hotspot habitat has been destroyed by humans. Today, biodiversity hotspots account for merely 2.4% of the surface. Yet, these vital areas still host approximately 60% of the world's terrestrial life. At the same time, biodiversity hotspots are home to around 2 billion people, including some of the world's poorest populations. This is to say, the hotspots provide crucial ecosystem services for human life, such as the provision of clean water, pollination, and climate regulation³⁶.

Most of our farms are located in such biodiversity hotspots. Consequently, the protection and restoration of such areas play a central role for us.



Maquencal: From conventional monoculture to sustainable agroforestry

Maquencal is located in one of the world's ecosystems with the highest priorities for conservation: the tropical dry forest.

Dry forests have been the preferred zones for agriculture and human settlement in Mesoamerica, the Caribbean, and South America and are amongst the most heavily utilized, perturbed, and least conserved of the large tropical ecosystems. With so little of its area intact and even less protected, the tropical dry forest ecosystem is currently one of the most threatened ecosystems in the world. In Colombia, 92% of its original cover has been lost and only 5% of what remains is under protection. This ecosystem is home to important species such as the cotton top-tamarin, an endemic Colombian primate, and the red-legged tinamou, a threatened species in the Caribbean region of Colombia.

When 12Tree acquired Maquencal in 2018, the farm was a cacao monoculture with low productivity levels and high pest incidence. To restore the productivity of the farm while providing habitat for biodiversity right from the start, the objective has been to rehabilitate and manage the land in ways that enhance the richness of biodiversity, reduce greenhouse gas emissions, and enhance resilience to climate change. In short, moving from nature-negative to nature-positive farming.

To start, existing areas of naturally regenerated forest and gallery forests within the farm were protected and excluded from agricultural production. In terms of farm productivity, maintaining these habitats is key to boosting crop pollination and natural pest control because they provide food and nesting areas for pollinating and beneficial predatory insects. At the landscape level, these areas are

extremely important for encouraging the movement of forest organisms (primates, mammals, birds, etc.) among the remaining patches of natural vegetation.

Recognizing the challenging weather and soil conditions of the site (a 4-month dry period, sandy soils with poor structure and organic matter content), it was necessary to redesign the agroecosystem so that it functioned on the basis of a new set of ecological processes. Nitrogen-fixing cover crops native to the area were identified and are being planted below the canopy of the cacao trees to jumpstart natural processes of soil restoration. This reintroduction of diversity through cover crops provides a proactive approach to farm management: focusing on preventing problems before they occur, rather than trying to control them after they happen. Among the many other benefits, cover crops suppress weeds and thus reduce the need for herbicides, while at the same time helping to attract beneficial species and thereby reducing the need for pesticides and chemical inputs.

When analyzing the effect that these practices have at the landscape level, today Maquencal is a more biodiversity friendly agroecosystem in the sense that it facilitates interpatch migration. For example, this cacao plantation may not provide the appropriate habitat for a particular orchid species, but it does provide a habitat that will allow the movement of pollinating euglossine bees, effectively facilitating the mixing of genes between patches of appropriate habitat in the landscape.





OUR COMMUNITY



Introduction

The commodification of agriculture and food chains has transformed our society.

Crops and raw materials generally produced in the world's rural areas now feed and sustain an increasingly urbanized and globalized population. On the one hand, commodity agriculture has made food more affordable and accessible. On the other hand, the very principles that underlie commodity agriculture- efficiency, economies of scale, and cost minimization- are often associated with a sort of "race to the bottom" where low prices are achieved at high environmental and social costs³⁷. Some of the obvious losers in this game are the small farmers, forced to compete in a heavily distorted market with ever declining margins, or abandon farming altogether³⁸. Similarly, agricultural workers have become an undervalued and expendable cog in the machine, often toiling under difficult or dangerous conditions for meager wages³⁹.

12Tree's mission to de-commodify agriculture is founded in the belief that agricultural workers, farmers, and rural communities are the necessary foundation of global value chains and essential for climate adaptation. Intimately connected with the landscapes in which we produce and source our products, these rural communities are truly stewards of the land. Under their watchful care, ecosystems will be protected and restored. Moreover, the empowerment of local farmers is critical for achieving the Sustainable Development Goals of eradicating poverty (SDG1), abolishing hunger (SDG2), and sustainable production patterns (SDG12) .

Starting with the initial conception and design of our farms, and continuously integrated into our on-going operational decisions, 12Tree seeks to maximize positive social impact in ways that are monitorable and measurable. At the foundation of our projects are good jobs, healthy working environments, and beneficial sourcing programs. This includes inclusive hiring processes and reliable contracts that provide fair salaries and benefits; safe, sanitary, and welcoming working environments that exceed the highest industry standards; and transparent, reliable, above-market offtake agreements with smallholder farmers.

Over and above this foundation, our focus on developing human capital leads us to invest in worker training to improve existing skills and knowledge and foster new areas of expertise. Local empowerment includes investing in basic community needs and working with communities to identify and address underlying structural issues. Finally, de-commoditize agricultural sourcing means creating mutually beneficial partnerships by: facilitating farmer organization and transparent communication; improving access to information, inputs and markets; and benefits sharing.



Scan the QR code for video insights into our farm activities or click here:



Bridging the gap towards living wages

At the core of 12Tree's approach to community is our commitment to providing good and fair jobs to all of our employees.

At the most basic level, this commitment ensures fair and inclusive hiring practices and salaries that are above minimum wage with health and pension benefits. But our ambition goes far beyond this: we aim for all workers to earn a dignified livelihood, one in which workers are able to support their families and comfortably meet their daily needs, with sufficient savings to overcome urgent and unexpected setbacks without falling into debt.

At the international level, movements are underway to ensure that workers across industries- from manufacturing, to textile, to agriculture- are paid wages commiserate with their efforts and sufficient to live dignified lives. One concept that has emerged is the "Living Wage," an alternative measure of basic needs that goes beyond nationally determined minimum wage or poverty lines, and instead analyzes the costs of geographically specific expenditures (food, childcare and schooling, health, housing, transportation, etc.) in order to identify the true costs of living, and therefore the salary needed to satisfy that cost. In agriculture, certification entities such as Rainforest Alliance/UTZ and FairTrade have incorporated the living wage into their certification programs, while industry leaders such as Mars Wrigley and UniLever are building the concept into their global sourcing strategies.

In 2021, 12Tree piloted its first Living Wage study at our Platanera Rio Sixaola (PRS) farm in Costa Rica. The PRS farm and project management team, led by a visiting researcher from Yale, collected and analyzed data about the salaries and bonuses earned by workers. They calculated the workers expenditures on basic needs and goods, and also took into consideration where PRS's company benefits -such as medical coverage, pension, meals, savings, severances, etc.- help reduce workers' cost of living. The study not only helped PRS to understand the gap between the wages earned by some workers and the "living wage", but it also provided insights into the economic challenges faced by workers, and how the farm can help to mitigate those costs. For example, some of the key insights included:

1. **FOOD COSTS** are inordinately high in the region: workers spend 22-44% of household income on food;

2. **COMBINING PAYMENT STRUCTURES** (hourly, pay-per-piece) can maximize efficiencies and result in higher earnings for workers in the banana packaging facilities;

3. **THE SEVERANCE PAYMENT** is relied on when larger sums of cash are required due to the lack of savings or credit options.

The Living Wage study results were shared with farm managers and worker representatives to facilitate a discussion about how PRS can help to bridge the gap between the current and wages and the living wage by generating better earnings and reducing costs. Several strategies have been developed for the long term, but those currently underway include: piloting new payment structures for banana packers; creating a subsidized staple foods agreement with local grocery stores; and a weekly nutritious meals program for workers' children.

In addition to the insights used at the farm level, 12Tree used its experience as an early tester of the Living Wage methodology to provide feedback and recommendations to the developers of the methodology Sustainable Trade Initiative (IDH) to help strengthen the methodology and tools. We are currently carrying out a second Living Wage and Living Income study at Andean Cacao using a complementary methodology to provide us, and the broader industry- with additional insights to continue improving this important approach.

Small farmers, big impact

Five of every six farms in the world are small -less than two hectares- and family run operations.

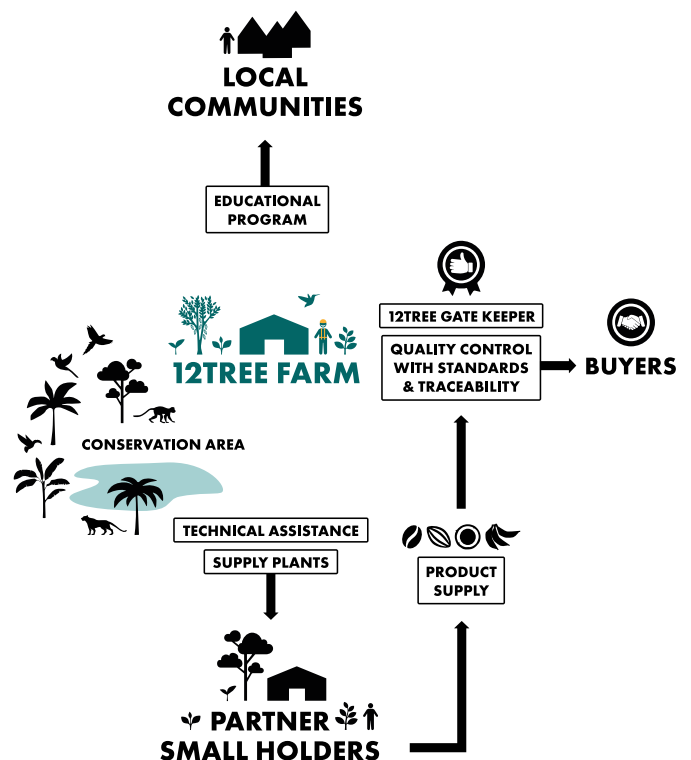
Yet a recent study by the Food and Agriculture Organization of the United Nations shows that these approximately 500 million smallholder farmers manage 12% of the world's farmland and produce approximately 35% of the world's food⁴⁰. Many of these farms are located in the rural tropics, in areas that are critical for the protection of biodiversity and carbon-rich forests, as well as the preservation of nature-based livelihoods and cultural values. For these reasons, it is incredibly important to ensure that smallholder farmers can earn viable livelihoods through their farming, and without expanding their farms by cutting or burning remaining forests⁴¹. But the challenges facing smallholders are manifold: small volumes and low productivity; lack of production technology, knowledge, and training; missing or limited markets; and inefficient, sometimes exploitative supply chains⁴². Generally, the more rural and inaccessible the farm is, the more difficult it is for the farmer to make ends meet from their farm.

Part of 12Tree's mission is to meaningfully incorporate smallholder farmers into our production models to ensure that local farmers and rural communities thrive right alongside us. This "nucleus plasma" approach envisions 12Tree's central farm and processing facilities as a point of access for surrounding farmers to be folded into an inclusive, beneficial sourcing model. Aspects of our model include:

- 1. RELIABLE LONG-TERM OFFTAKE AGREEMENTS** with transparent and fair pricing;
- 2. ACCESS TO HIGHER-VALUE AND NICHE MARKETS**, including through certification;
- 3. KNOWLEDGE TRANSFER AND CAPACITY BUILDING** for farming practices, land and resource management, and environmental protection;
- 4. ACCESS TO TECHNOLOGY** including tools, machinery, and inputs for farming and processing;
- 5. SUPPORT FOR FARMER ORGANIZATION** and a platform for inclusive dialog; and,
- 6. IMPROVED ECONOMIC RESILIENCE** through income diversification and benefit sharing opportunities.

While these core tenets are central to our sourcing model, our various "smallholder programs" are tailored to each farm's unique context, considering aspects like local demographics, environment, and crop.

Take, for example, 12Tree's smallholder project at the Chimelb farm in Guatemala. The "CarCao Forest Project" launched as a five-year partnership between 12Tree and Heifer International aims to support 500 families in 20 communities to achieve a "living income" through improved agroforestry value chains for cacao and cardamom. Benefitting from the expertise and experience of participating stakeholders -including local and national governments, non-profits, and Chimelb's own farm operations company- CarCao Forest has been developed using a bottom-up approach. Heifer International's strength in community organization and local capacity development makes them the perfect partner to compliment 12Tree's strength in agroforestry and marketing. In spite of the global pandemic, in 2021, the project reached 116 families in five indigenous communities neighboring Chimelb, and established five community nurseries nurturing more than 75,000 plants of cacao, cardamom, black pepper, mahogany, cedar, and other tree species.



While sharing the same core vision, 12Tree's smallholder program by Andean Cacao in Colombia has an entirely different design and structure. The "Origen Boyaca" program was launched in 2016 as a joint-venture model in which Andean Cacao partnered with smallholder farmer associations in Colombia's Boyaca region to source, process, and sell high-quality cacao. This innovative model leverages strategic partnerships and a corporate off-take agreement to situate farmers as shareholder, mutually invested in and dedicated to the business' success. Grant funding has enabled farmer associations to enter into the venture without risk, and also providing resources and expertise for key sustainability activities relating to gender, living income, and environment, amongst others. Likewise, through the development of a strong relationship with Mars, Andean Cacao was able to secure a long-term offtake agreement that shelters farmers from market price shocks and provides

with them stable and clear product specifications. Origen Boyaca focuses on building the organizational capacity and farming skills of participating farmers through ongoing trainings and technical assistance: in 2021, 337 received technical assistance, while 41 ha were grafted and 22 ha were planted with improved varieties. With exceptional traceability and quality control systems in place, the venture purchased more than 50 tons from smallholder farmers, earning them awards by GoodNow Farms and the honor of representing Colombia at the Salon du Chocolat.

While incredibly different, both programs achieve meaningful social impact through inclusive models that put farmer well-being at the fore. Focusing on capacity development and quality production destined for high-value markets, these programs are benefitting farmers now, and paving the way for their future.





LA GLORIA
COLOMBIA
2700 ha

La Gloria: Participatory planning for transformation

Communities are an intrinsic part of living landscapes. As custodians and beneficiaries of biodiversity, local communities are central actors for healthy and resilient ecosystems.

Community engagement and participation are therefore crucial to achieving positive environmental outcomes. Involving and empowering communities as key agents of change for regenerative practices has several benefits such as the co-creation of local knowledge and improvement of environmental awareness for conservation among the community members. For instance, community

elders frequently hold valuable knowledge about local ecological conditions and processes that can help to enhance regenerative farming systems. Children, on the other hand, are the future generation and consequently their relationship to the environment is fundamentally important. With a strong focus on community engagement and outcomes, our sustainability team has set up a transformative program at La Gloria. The major ambitions of the program are to include local needs and lived experiences in strategic planning as well as to encourage communities to play a vital part in the conservation of local biodiversity.





As a first step towards these goals, the 12Tree team carried out a stakeholder mapping and needs assessment exercise to better understand the social context of the field workers and communities in the immediate vicinity of La Gloria. The team then developed a communications strategy and a community engagement program aimed at addressing some of the self-identified community needs by using the expertise, passion, and resources available from 12Tree, La Gloria, and the communities themselves. The foremost priority was establishing a transparent line of communication with the communities. This strategy was kicked off with two community events:

EVENT NUMBER 1: Introduction to 12Tree's farming approach.

Through a well-publicized, open event, the 12Tree team invited La Gloria workers, community members, municipal representatives, and representatives from our operating partner, Refocosta, to introduce the history and vision of 12Tree, and explain the sustainable forestry practices that distinguish La Gloria from a conventional forestry project. A comprehensive Q&A session with a dozen and a half participants allowed for interaction with the personnel behind the operations and sustainability activities at the farm. This event laid the foundation for upcoming participatory planning events, in which the team and community members will co-create social programs and activities together.

EVENT NUMBER 2: Children Introduction Event.

12Tree hosted a second open event to introduce the company vision and programs in an interactive and engaging way to children, the elderly, and parents. Focusing on local biodiversity and the unique tropical dry savannah ecosystem in which La Gloria is located, 12Tree asked community elders to identify some native plant and animal species that are culturally and traditionally relevant. Participating elders were trained on storytelling techniques by Social Coordinator Yuliet Polo Gomez. On the day of the event, they spoke about the local tree, plant, and animal species while the children painted colorful pictures of them. In total, 21 children participated, along with 3 elders alongside many parents and family members. The event was very well received, with videos of the event on YouTube already accumulating dozens of views.

Through these events we have established respectful and collaborative relationships with the neighboring communities. With a strong emphasis on human and social value we will continue to foster the involvement of the communities as a vital force for the protection of local biodiversity and landscapes on which the communities rely for their livelihoods.

List of sources

- ¹ International Platform for Insetting (2022): What is insetting. Available online: <https://www.insettingplatform.com/insetting-explained/#why-insetting>.
- ² World Economic Forum and McKinsey & Company (2021): Consultation: Nature and Net Zero. <https://www.mckinsey.com/~media/mckinsey/business%20functions/sustainability/our%20insights/why%20investing%20in%20nature%20is%20key%20to%20climate%20mitigation/nature-and-net-zero-vf.pdf>
- ³ UNCCD (2022): Global Land Outlook: Land Restoration for Recovery and Resilience. https://www.unccd.int/sites/default/files/2022-04/UNCCD_GLO2_low-res_2.pdf
- ⁴ The Guardian (2020): This article is more than 1 year old. Online available: <https://www.theguardian.com/environment/2020/nov/24/farmland-inequality-is-rising-around-the-world-finds-report#:~:text=One%20per%20cent%20of%20the,the%20climate%20and%20nature%20crises>.
- ⁵ National Geographic (2022): Grasslands Explained. Available online: <https://education.nationalgeographic.org/resource/grasslands-explained>.
- ⁶ <https://fsc.org/en/for-forests/high-conservation-values#:~:text=From%20endemic%20species%20to%20sacred,conservation%20values%2C'%20or%20HCVs>.
- ⁷ N.J. Deere, Guillera-Arroita, E.L. Baking et al. (2017): High Carbon Stock forests provide co-benefits for tropical biodiversity. DOI: <https://doi.org/10.1111/1365-2664.13023>.
- ⁸ Oerke, E.-C. (2006): Crop losses to pests. In *J. Agric. Sci.* 144 (1), pp. 31–43. DOI: 10.1017/S0021859605005708.
- ⁹ Zimdahl (2018): Chapter 10 - Methods of Weed Management. In Robert L. Zimdahl (Ed.): *Fundamentals of weed science*. Fifth edition. London, San Diego, CA, Cambridge, MA: AP Academic Press an imprint of Elsevier, pp. 271–335.
- ¹⁰ van Bruggen, A. H. C. et al. (2018): Environmental and health effects of the herbicide glyphosate. In: *The Science of the total environment* 616-617, S. 255–268. DOI: 10.1016/j.scitotenv.2017.10.309.
- ¹¹ Upadhyaya, M.; Blackshaw, R. E. (2007): *Non-chemical Weed Management: Synopsis, Integration and the Future*. In M. Upadhyaya, R. Blackshaw (Eds.): *Non-chemical weed management: principles, concepts and technology*. Wallingford: CABI, pp. 201–208.
- ¹² Britannica, The Editors of Encyclopaedia. «biological control». (2015): <https://www.britannica.com/science/biological-control>. Accessed 11 May 2022.
- ¹³ Britannica, The Editors of Encyclopaedia. «date palm». (2015): <https://www.britannica.com/plant/date-palm>. Accessed 9 May 2022.
- ¹⁴ Antonie C. Fountain, Friedel Huetz-Adams (2020): Cocoa barometer. Südwind Institut. <https://www.suedwind-institut.de/files/Suedwind/Publikationen/2020/2020%20Cocoa%20Barometer.pdf>
- ¹⁵ WWF (2021): Vom Kakaobaum bis zum Konsumenten: Woher kommt der wertvolle Rohstoff? <https://www.wwf.de/themenprojekte/landwirtschaft/produkte-aus-der-landwirtschaft/kakao>
- ¹⁶ Public Eye (2017): Die dunkle Seite der Schokolade. https://www.publiceye.ch/fileadmin/doc/Schokolade/2017_PublicEye_Die_dunkle_Seite_der_Schokolade_Flyer.pdf
- ¹⁷ World Cocoa Foundation (2020): New Research Insights for Brighter Future for Children in Cocoa | World Cocoa Foundation. <https://www.worldcocoafoundation.org/blog/new-research-insights-for-brighter-future-for-children-in-cocoa/>
- ¹⁸ Fairafric (2020): the impact of climate change on cocoa farming in ghana. <https://fairafric.com/en/the-impact-of-climate-change-on-cocoa-farming-in-ghana/>
- ¹⁹ International Coffee Organization (2020): *Coffee Development Report (2020). The value of coffee – Sustainability, Inclusiveness and Resilience of the Coffee Global Value Chain*.
- ²⁰ CBI (2021): What is the demand for coffee on the European market? <https://www.cbi.eu/market-information/coffee/trade-statistics>.
- ²¹ Yangdi Lu (2022): Coffee Report. Statista Consumer Market. <https://de.statista.com/statistik/studie/id/48895/dokument/coffee-report/>

- ²² Friedel Hütz-Adams; Mara Mürlebach (2020): Auf ein Tässchen - Die Wertschöpfungskette von Kaffee. SÜDWIND e.V. – Institut für Ökonomie und Ökumene. Bonn. <https://www.suedwind-institut.de/files/Suedwind/Publicationen/2020/2020-01%20Studie%20Auf%20ein%20T%C3%A4sschen%20Die%20Wertsch%C3%B6pfungskette%20von%20Kaffee.pdf>
- ²³ Specialty Coffee Association's (2015): Benchmarking Report and Coffee Price Report. <https://sca.coffee/availableresearch>.
- ²⁴ Coste, René and Myhrvold, Nathan (2021): «coffee production». Encyclopedia Britannica. <https://www.britannica.com/topic/coffee-production>.
- ²⁵ WWF Deutschland (2020): Like Ice in the sunshine – Pflanzenöle und Fettein Speiseeis. Das Beispiel Kokosöl. https://www.wwf.de/fileadmin/fm-wwf/Publicationen-PDF/WWF-Studie_Like_Ice_in_the_Sunshine_2020.pdf
- ²⁶ Marife L. Moreno, John K. M. Kuwornu & Sylvia Szabo (2020) Overview and Constraints of the Coconut Supply Chain in the Philippines, *International Journal of Fruit Science*, 20:sup2, S524-S541, DOI: 10.1080/15538362.2020.1746727
- ²⁷ Abeysekara, MGD & Waidyanarathne, KP. (2020): The Coconut Industry: A Review of Price Forecasting Modelling in major Coconut Producing Countries. *Cord.*, 36: 17-26.
- ²⁸ USAID (2020): SUSTAINABLE COCONUT CHARTER LAUNCH: Forging a More Sustainable Coconut Industry. 4th Sustainable Coconut and Coconut oil Roundtable. USAID Green invest Asia and Barry Callebaut. November 2016, Webinar. Available at: https://www.sustainablecoconutcharter.com/_files/ugd/1efbb5_aac4d512491a4f84828c149a687a82f6.pdf.
- ²⁹ IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.
- ³⁰ PlanA (2022): What are Scopes 1, 2 and 3 of Carbon Emissions? Available at: <https://plana.earth/academy/what-are-scope-1-2-3-emissions/>
- ³¹ Conservation Hierarchy (2022): What is the mitigation & conservation hierarchy? Available at: <https://conservationhierarchy.org/what-is-conservation-hierarchy/>
- ³² Greenhouse gas protocol (2022): A Corporate Accounting and Reporting Standard. Available at: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>.
- ³³ A. Power (2010): Ecosystem services and agriculture: tradeoffs and synergies. *Philos Trans R Soc Lond B Biol Sci.* 365 (1554): 2959–2971.
- ³⁴ Biodiversity information system (2022): Agroecosystems. <https://biodiversity.europa.eu/ecosystems/agroecosystems>
- ³⁵ Conservation International (2022): Why are biodiversity hotspots important? <https://www.conservation.org/priorities/biodiversity-hotspots#>.
- ³⁶ Weinzettel et al. (2018): Human footprint in biodiversity hotspots. DOI: 10.1002/fee.1825.
- ³⁷ Wilkinson, J. (2011). From fair trade to responsible: social movements and the qualification of agrofood markets. *Environment and Planning A-43* (2011), pp. 2012-2026
- ³⁸ United Nations (2011). The Global Food Crises. Available at: <https://www.un.org/esa/socdev/rwss/docs/2011/chapter4.pdf>
- ³⁹ De Schutter, O., Building Resilience: a Human Rights Framework for World Food and Nutrition Security, UN, 2008.
- ⁴⁰ Lawder, S., Sánchez, M.V., & Bertini, R. (2021). Which farms feed the world and has farmland become more concentrated? *World Development*. Vol. 142. Available at: <https://www.sciencedirect.com/science/article/pii/S0305750X2100067X?via%3Dihub>
- ⁴³ Godar, J. et al. (2011). Who is responsible for deforestation in the Amazon? A spatially explicit analysis along the Transamazon Highway in Brazil. *Forest Ecology and Management*, Vol. 267. Available at: <https://doi.org/10.1016/j.foreco.2011.11.046>
- ⁴² Graeub, B. E., et al. (2016). The state of family farms in the world. *World Dev.* 87, 1–15. doi: 10.1016/j.worlddev.2015.05.012

Glossary

TERM	DEFINITION	SOURCE
AFFORESTATION	Afforestation stands for the establishment of forests where previously there have been none, or where forests have been missing for a long time.	LINK
AGROECOSYSTEM	Agroecosystems, are defined as communities of plants and animals interacting with their physical and chemical environments that have been modified by people to produce food, fibre, fuel and other products for human consumption and processing.	LINK
BEAN-TO-BAR	Bean to bar refers to a trade model. It generally indicates that one brand controls every stage, from the purchase of the ethically-sourced beans to the creation of high-quality chocolate bars.	LINK
ENDEMIC SPECIES	Endemic species are plants and animals that exist only in one geographic region. Species can be endemic to large or small areas of the earth: some are endemic to a particular continent, some to part of a continent, and others to a single island.	LINK
HIGH CARBON STOCK	High Carbon Stock is a methodology that distinguishes forest areas for protection from degraded lands with low carbon and biodiversity values more apt for development.	LINK
HIGH CONSERVATION VALUES	High conservation value areas are defined as natural habitats of outstanding biological, ecological, social, or cultural values at the national, regional, or global level.	LINK
INSETTING	Insetting represents the actions taken by an organization to fight climate change within its own value chain in a manner which generates multiple positive sustainable impacts ² .	LINK
OFFSETTING	Offsetting means compensating for own emissions through the purchase of carbon credits. These credits are generated from so-called offset projects that prevent or eliminate GHG emissions.	LINK
REFORESTATION	Reforestation describes the process of establishing a forest cover in a location where the forests have been cleared in the recent past, usually to repurpose the land for activities like agriculture or mining.	LINK



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1.2.TREE
growing values

***"We transform the way agriculture
is practiced through transparency &
accountability."***