Biodiversity in Cocoa Cultivation

Presentation Slides

On behalf of
Federal Ministry for Economic Cooperation and Development

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

COCOA FOR CONSERVATION

Strengthening Deforestation-Free and Nature Positive Supply Chains

FOOD & AGRICULTURE
WWF Colombia

Im Auftrag des
Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung

Durchgeführt von:
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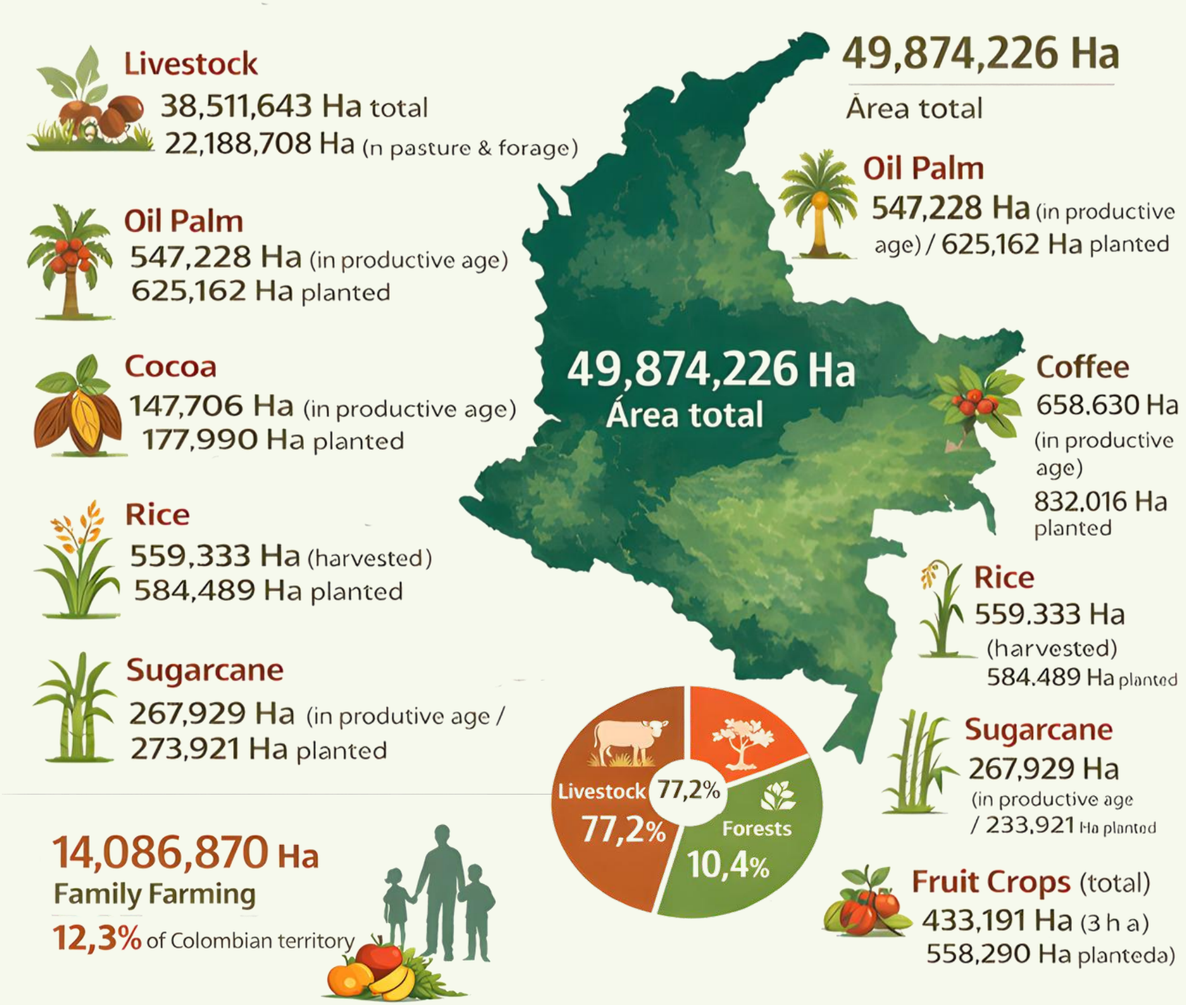
SOME CONTEXT:
COLOMBIA KEY NUMBERS

Understanding the Landscape:
The Scale of the Challenge

Being 'deforestation-free' in a complex landscape requires looking beyond satellite imagery; it requires managing the boundary where agriculture meets the people, meets the forest.



Source: ENA – DANE, 2023

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WHAT ABOUT DEFORESTATION OR CONVERSION?

In Colombia, the production of agricultural and livestock commodities is not a significant driver of deforestation at the national scale.

Extensive (with unsustainable practices) cattle ranching is the exception.

However, value chains such as oil palm, coffee, and cocoa at the local level can become drivers of deforestation, given the socio-economic conditions of producers and the nature of their production systems. At the same time, they also present important opportunities to strengthen livelihoods, promote biodiversity conservation, and serve as effective strategies for preventing deforestation.

Aspects such as formality, informality, and illegality are key factors.

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WHAT ABOUT DEFORESTATION OR CONVERSION?

- Preventive approach to deforestation and conversion on key value chains
- In some cases, deforestation alerts may appear within or near cocoa plots. However, these alerts may correspond to historical events or to other land-use drivers, not to cocoa cultivation.
- Most cocoa in Colombia is produced by smallholders using low-intensity systems, which typically do not generate large-scale deforestation.

Areas at high risk of deforestation associated with four prioritised chains

High risk areas for conversion of savannahs and wetlands associated with the foru prioritised chanis

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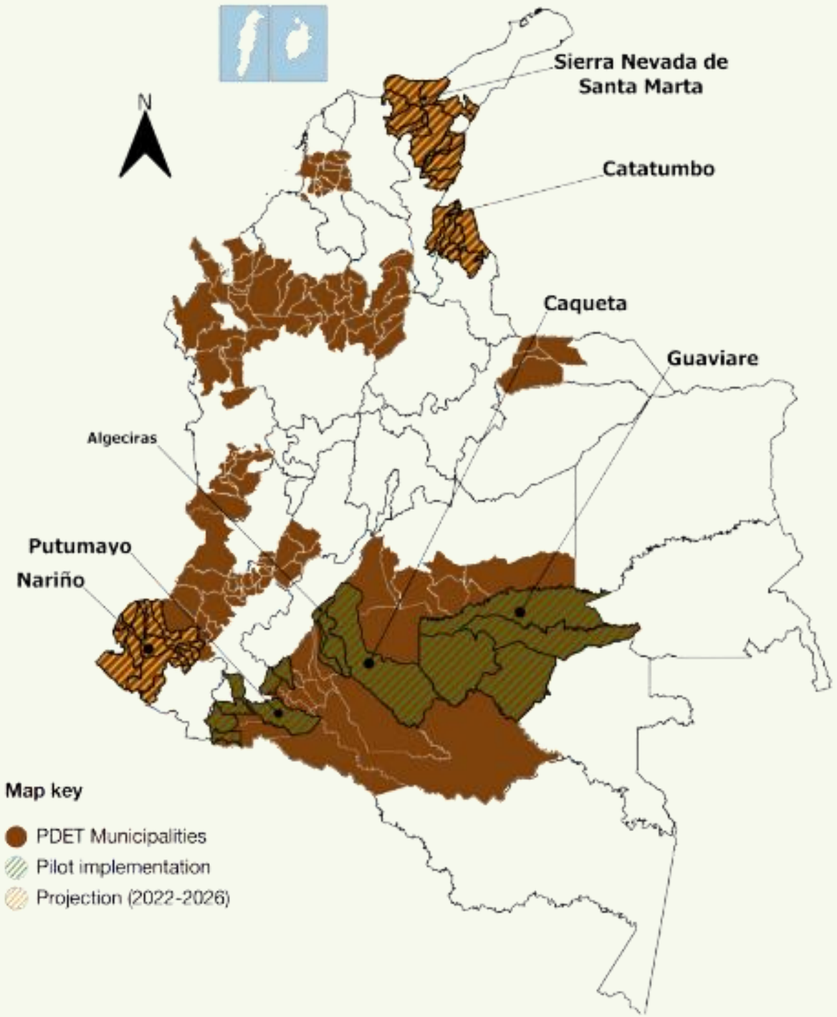
COCOA IN COLOMBIA DCF

- Cocoa is being promoted as a restorative and peace-building crop, helping recover degraded lands through agroforestry.
- Areas with both cocoa presence and high historical deforestation represent priority zones for restoration, not necessarily evidence of current forest clearing by cocoa farmers.
- Strengthening monitoring, traceability, and technical assistance can help ensure that cocoa becomes a deforestation-free and Nature - Positive commodity in Colombia.



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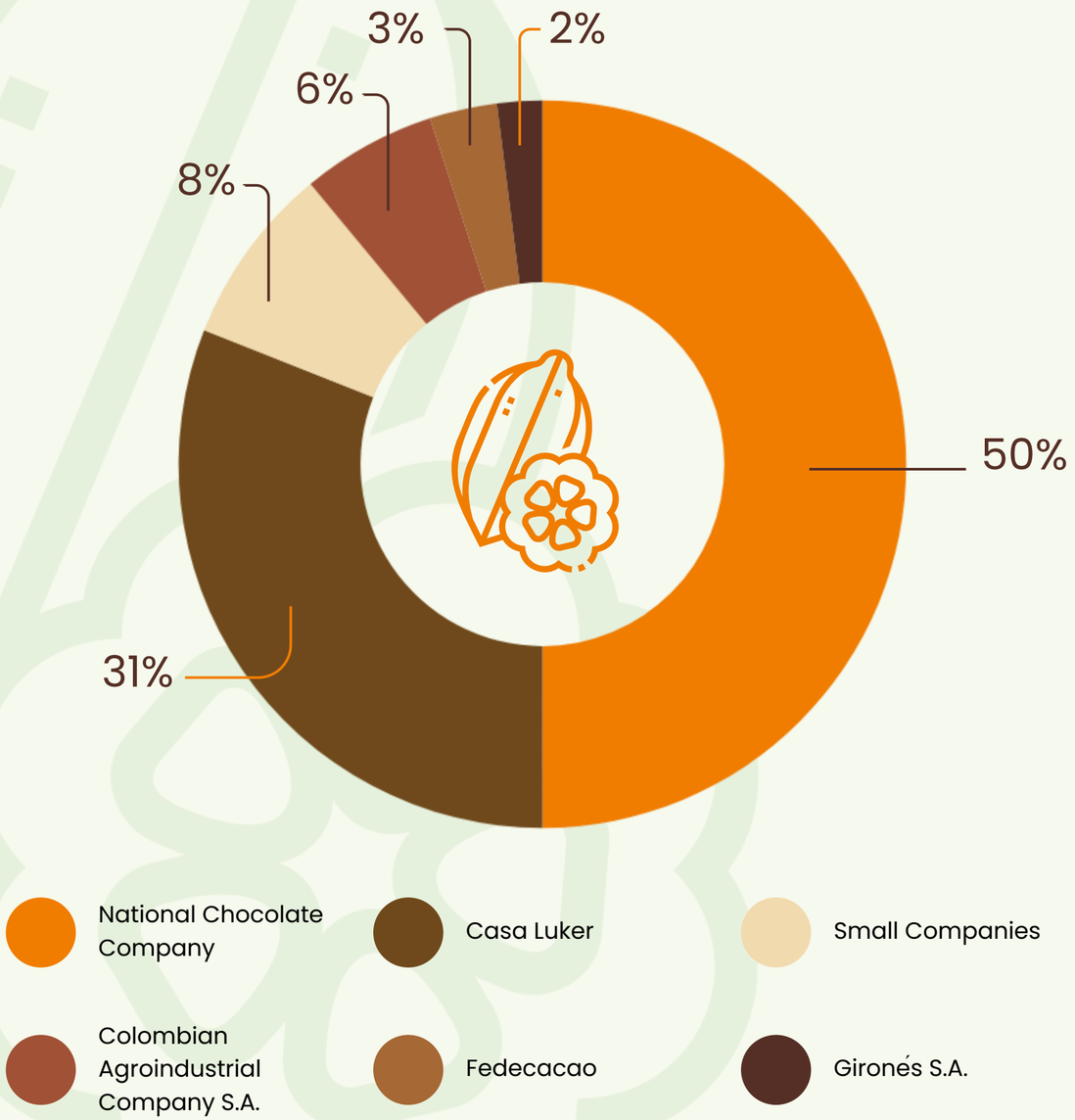
COCOA IN COLOMBIA

WHO BUYS COLOMBIA'S COCOA?



- Colombia exports cocoa and its derivatives to more than 15 countries.
- Colombia's cocoa market is highly concentrated, with two major companies absorbing over 80% of national production.
- Small companies account for only 8%, reflecting the need to strengthen local value addition. 46% of national employement –Small farmers (3Ha per producer on average
- The dominance of a few buyers shapes pricing, traceability systems, and incentives for deforestation-free cocoa.
- Present in 422 municipalities in 27 departments (Colombia has 32)

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BEYOND COMPLIANCE

40% of Colombian territory is Amazonia. Halting deforestation is the absolute floor for market access.

Can a chocolate bean conserve the nature and dignify the farmer at the same time?

Cocoa acting as an active catalyst for peacebuilding ecosystem regeneration and a living income in post-conflict regions.

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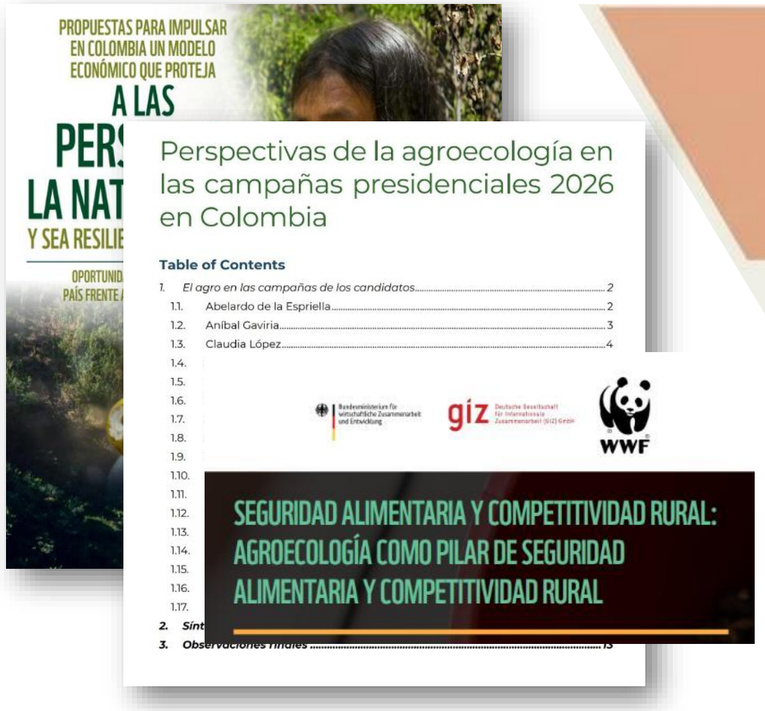
ADVOCACY: ALIGNING COLOMBIAN COCOA WITH GLOBAL GOALS



National Agroecology Law & other political instruments that enable legal basis for Nature-Positive agricultural practices

This deep policy alignment reduces corporate supply chain risks by embedding sustainability directly into the source country´s legal framework. It highlights that all actors are key, which is why we work with governments to ensure a sustainable future.

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Due Diligence:
Supporting local cooperatives in EUDR compliance

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1. Diagnosis and program design

Assessment of internal control systems in 7 Amazonian associations and design of a comprehensive capacity building program for EUDR compliance

2. Process and procedure integration

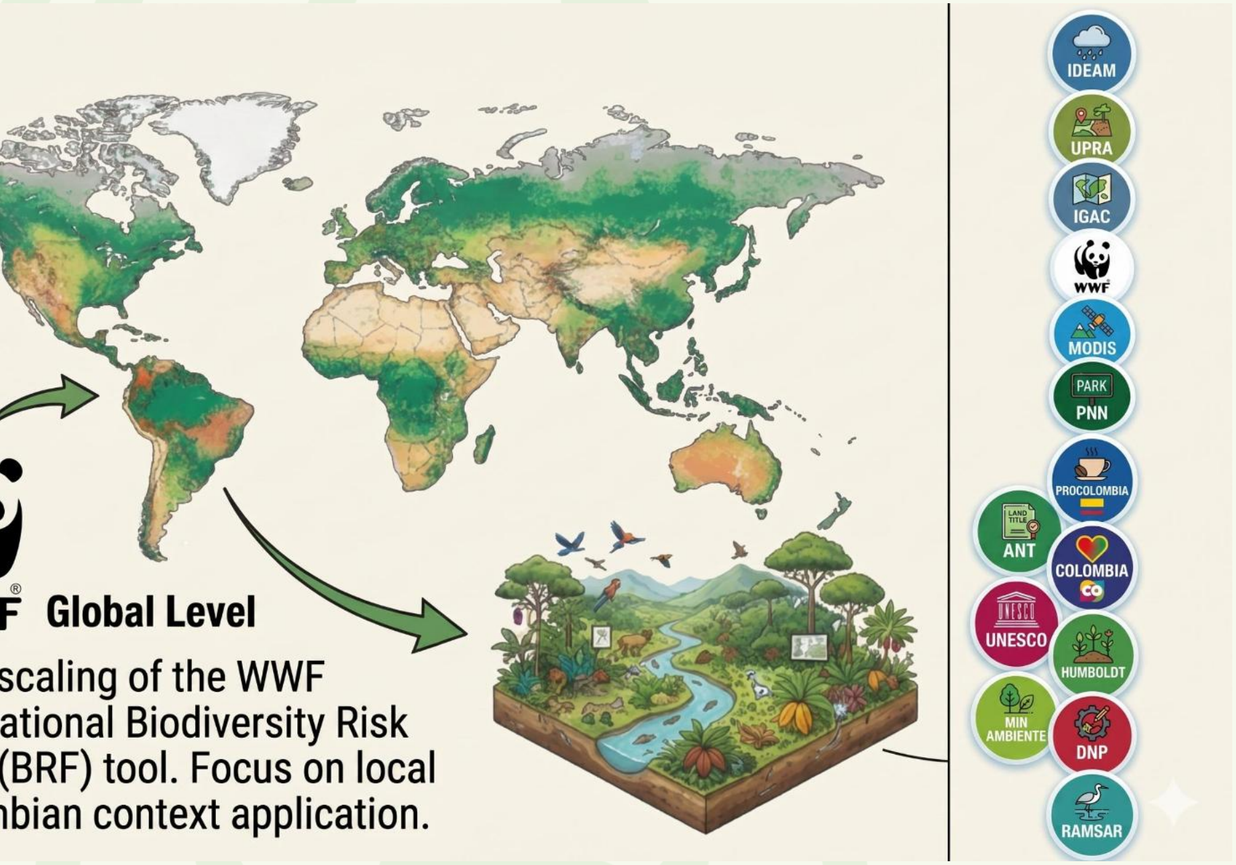
Practical support to integrate due diligence and zero deforestation processes into the associations´ internal control systems, adapting the process to their context.

3. Implementation and accompaniment

Deployment of the training and continuous accompaniment program for the implementation of due diligence procedures, focusing on the specific challenges of the amazon region.

Amazonian associations actively upgrading to provide transparent risk-free European sourcing

NATURE-POSITIVE PRACTICES KPIs & RISK ANALYSIS FOR COLOMBIAN CONTEXT



Biodiversity Risk Filter Downscaling

- Translating complex ecological data into actionable risk hotspots for the global, regional and national food and finance sectors, specifically for the Colombian context.

- Localizing the global WWF Biodiversity Risk Filter (BRF) tool specifically for the Colombian context to identify biodiversity risks.

Biodiversity Risk Filter

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NATURE-POSITIVE PRACTICES KPIs & RISK ANALYSIS FOR COLOMBIAN CONTEXT

- Data transparency turns visible nature risks and opportunities into manageable, reportable business metrics.

- Integrating global tools and local knowledge provides a robust framework for measurable and rewardable nature-positive actions in the cocoa sector.

Developing & Adapting Nature-Positive KPIs

Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind

Towards sustainable agriculture: A blueprint for European KPI-based farm-level assessment

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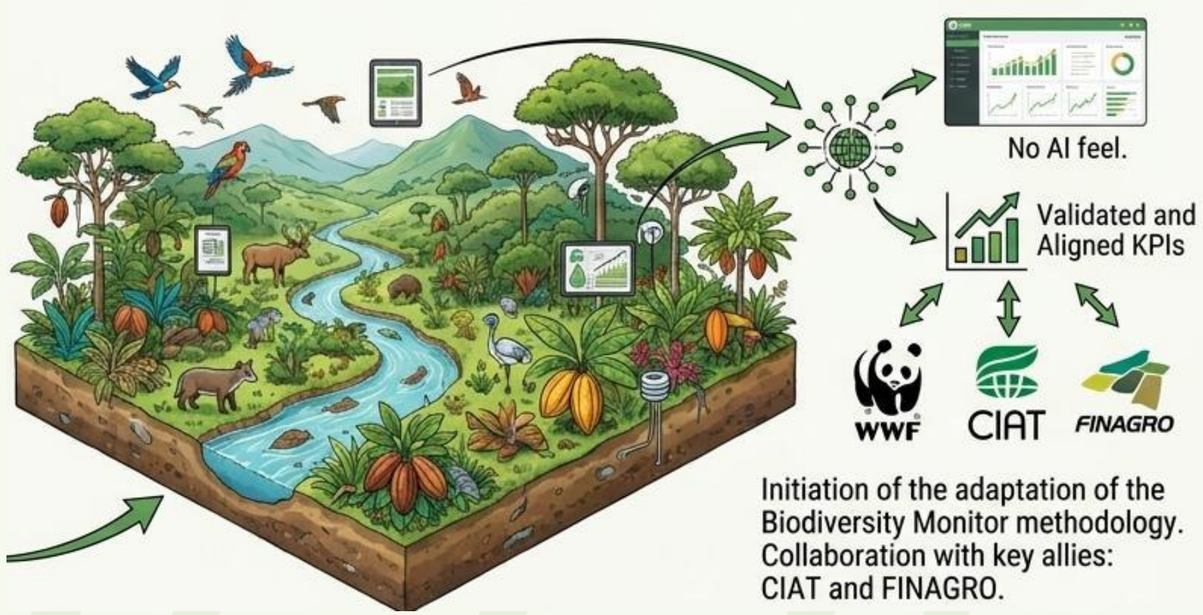
ARTICLE INFO

ABSTRACT

Key Performance Indicator (KPI) methodologies have emerged as potent tools for estimating sustainability



✓ **Agrobiodiversity:**

Soil health, crop resilience and post management.

✓ **Landscape elements:**

Tree coverage, shade integration, and buffer zones

✓ **Species diversity**:

Flora and fauna vitality (E.g. Jaguar Friendly ecosystems.

✓ **Regional biodiversity:**

Connectivity and broader ecological corridors.

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LEADING THE FUTURE OF FLAVOR

"Through nature positive cacao, we are not just preserving forests, we are securing the legacy of flavor and the livelihoods of our communities."

– Colombian Cacao Leader

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FINCA ENCANTO

WWF · 19 MAY 2026 · BERLIN

What biodiversity looks like from the farm

GERJET EFKEN · Founder, Finca Encanto · Guatemala

“I came thinking biodiversity was an ecological challenge. The countryside taught me it is mostly an economic one.”

A regenerative agroforest in Guatemala.

200

hectares of
regenerative agroforest

110,000+

cacao plants in
an agroforestry system

42

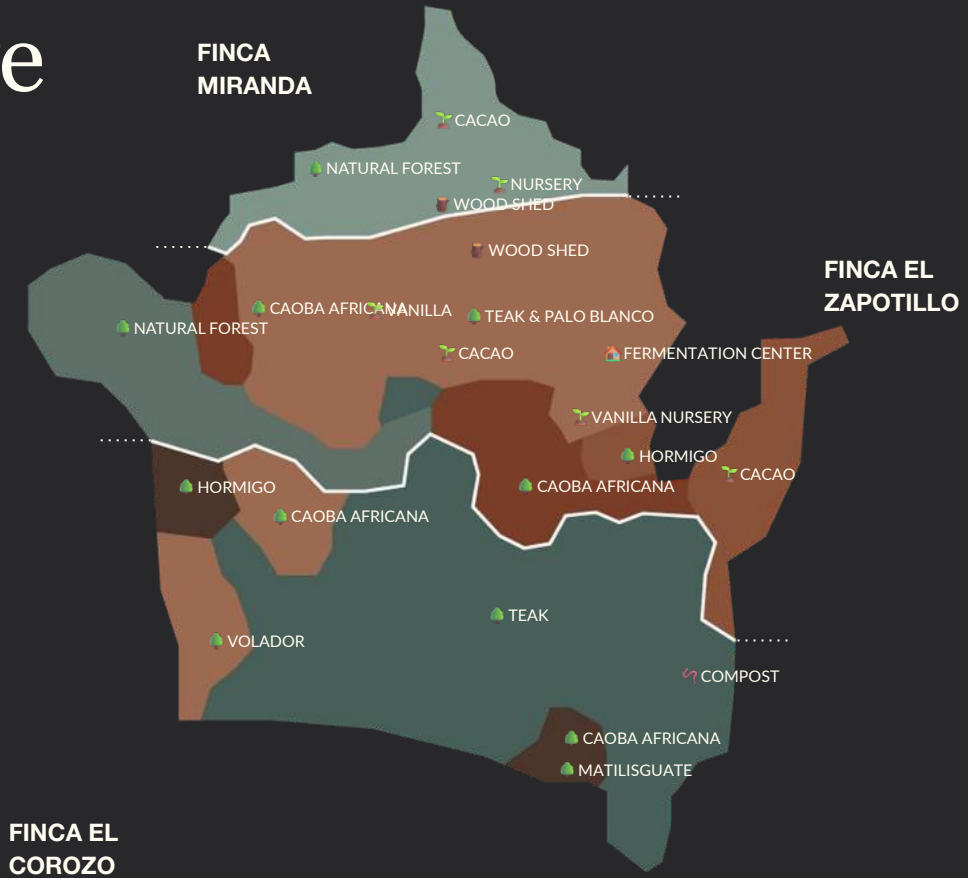
permanent local
employees

Top 3

Guatemala Cocoa Awards
(Cacao of Excellence)

“We are trying to prove that regeneration can become economically viable.”

The land we work with



Our team

The 42 people who make this real.

What farmers actually face.

01

Knowledge gap

150+ years of conventional coffee farming. Soil management and processing craft has been lost.

02

No transition finance

Cacao takes 4–5 years to produce real income. Few farmers can survive that gap.

03

Complexity built elsewhere

Organic + EUDR + export compliance is built for university graduates, not for smallholders.

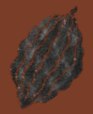
04

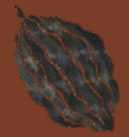
No real premium

Last harvest, organic and conventional cacao sold at almost the same price.

“A farmer cannot eat biodiversity metrics.”

Why good intentions break.





WHAT MANY PROJECTS OFFER

Tree planting & carbon credits
Reporting & monitoring
Certifications
Compliance frameworks

WHAT FARMERS ACTUALLY NEED

Cash flow during transition
Technical training
Processing infrastructure
Stable buyers & market access

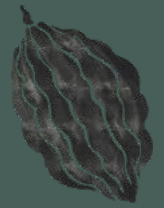
FROM OUR OWN LAND *20 years ago, teak was promoted as the answer. Today we spend years removing it to save the cacao below.*

Biodiversity as portfolio design.

Each crop fills a different time horizon.

CROP	FIRST INCOME	ROLE IN THE SYSTEM
Ginger	6–9 months	Bridges the early cash gap
Banana	1–2 years	Stabilises initial income & food
Pepper / Vanilla	2–4 years	High-value vines on shade trees
Cacao	4–5 years	Primary commercial crop
Timber & high shade	15–25 years	Generational capital & habitat

“Biodiversity emerges when farmers can survive the transition.”



Five shifts that would move the needle.

1	Transition finance	Bridge the 4–5 year gap before cacao starts to pay.
2	Technical education	Invest in soil management, regenerative agroforestry, processing know-how.
3	Simpler systems	If the paperwork needs a university degree, redesign it.
4	More value at origin	Fermenting, roasting, packaging — that is where the income grows.
5	Reward biodiversity economically	Through price and access — not only through compliance demands.

“Farmers do not adopt biodiversity because they are told to.
They adopt it when it becomes the best path toward a dignified future.”

CHUCULAT

From Bean to Bar with Purpose

2025–2026

A Colombian company that transforms cacao, territory and lives.

CHUCULAT

TODAY'S AGENDA

What we will cover

01 Who we are and what drives us

02 Our value chain

03 Materiality process — what truly matters

04 Environmental Pillar: protecting where cacao grows

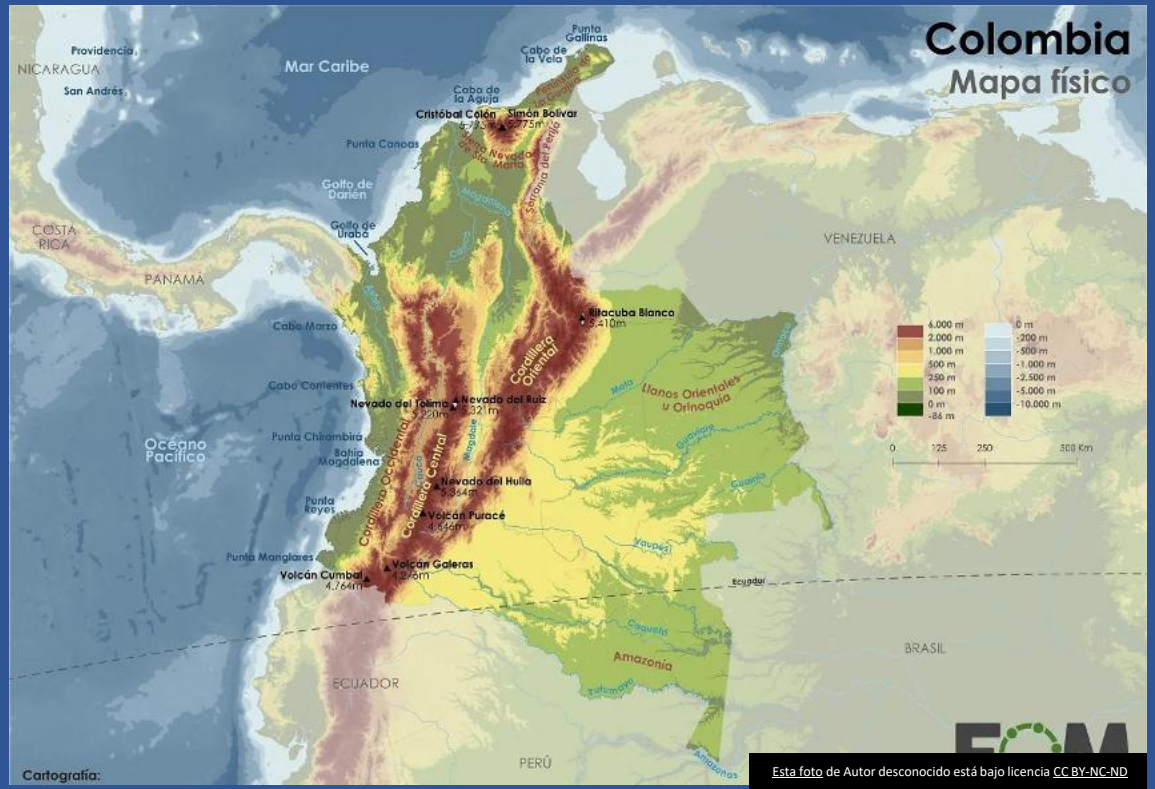
05 Social Pillar: farming families are at the heart

06 Governance Pillar: quality, traceability and integrity

07 Contribution to Global SDGs

08 Commitments and roadmap 2025–2027

Colombia. A megadiverse piece of land.



Colombia megadiversity

Colombia megadiverse

Colombia multicultural

The problem

- Area availabe for agriculture: 40 million hectares
- Planted Area: 6.7 million hectares.
- Low productivity Cattle Area: 35 million hectares
- Coca Area: 250 mil hectáreas

The Problem

The solution: Cacao

- It can be stored for long periods of time
- Is valuable
- High demand
- Colombia has a potential of 7.3 million de hectares
- Colombian cacao recognized as fine flavour
- Restore and regenerate soils
- Replace coca crops

ABOUT US

WHO WE ARE

SOBRE NOSOTROS

Colombian fine-flavor cacao transformation company.

- Business unit of Grupo Biz / Agrobiz (since 2006)
- Bean-to-bar model — no intermediaries
- Plant in Bogotá · Sourcing in 6 regions
- Participants in the Cacao, Forests & Peace Agreement

CACAO	PEOPLE	ORIGIN
Noble ingredient, symbol of territory	Farming families and our team	Quality, transparency and respect

CHUCULAT

VALUE CHAIN — FROM BEAN TO BAR

01	**Agricultural production**	Fine cacao, agroforestry, GAP, fermentation
02	**Local associations**	Collection, basic quality control, technical support
03	**Direct sourcing**	No middlemen, fair price, traceability
04	**Rural logistics**	Consolidated transport, humidity control
05	**Bogotá Plant**	Roasting · Grinding · Conching · Tempering
06	**Products**	Bars, snacks, cacao powder, beverages
07	**Distribution**	Retail, trade fairs, corporate clients
08	**Casa Chuculat**	Tastings, workshops, gastronomic tourism
09	**End consumer**	Transparent origin, natural ingredients

CHUCULAT

OUR MATERIAL COMMITMENTS

ENVIRONMENT

1. Zero deforestation and biodiversity
2. Agroforestry practices
3. Rural transport emissions
4. Energy consumption at plant
5. Water consumption
6. Packaging and waste

SOCIAL

7. Responsible sourcing and fair price
8. Rural socioeconomic development
9. Technical training for producers
10. Worker health and safety
11. Diversity and inclusion (rural women)
12. Innovation and consumer education

GOVERNANCE

11. Food safety and quality
12. Full cacao traceability
13. Responsible innovation

PILLAR 1

ENVIRONMENT

Sustainable Cacao Production and Environmental Management

"We protect the ecosystems where the best Colombian cacao grows"

CHUCULAT

HOW WE PROTECT THE ENVIRONME

ZEERO DEFORESTATION

- 100% cacao from areas with no recent deforestation
- Satellite verification + field visits
- Cacao, Forests & Peace Agreement
- Jaguar Friendly

2025: 100% geo-referenced suppliers

AGROFORESTRY

- Shade-grown cacao with native species
- Knowledge-sharing workshops between farms

2026: 70% of producers with shade management

ENERGY Y WATER

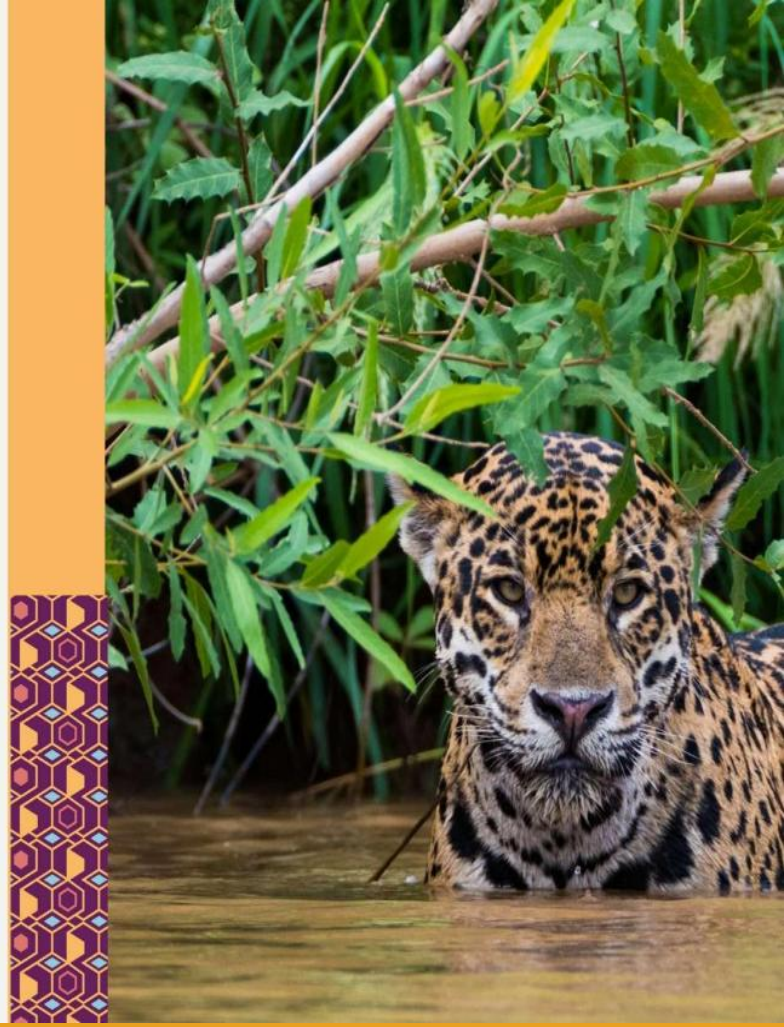
- Efficiency in roasting, grinding and conching
- Rational water use protocols

2026: -10% kWh/kg · -8% water per batch

PACKAGING

- Waste separation at plant
- Transition to compostable packaging

2026: 100% sustainable packaging



ESTD 2008 CHUCULAT
CACAO CRIOLLO COLOMBIA

#CACAO, FORESTS & PEACE

CHUCULAT is part of Cocoa, Forests & Peace (CB&P) a public-private initiative aiming to promote deforestation-free cacao production models, that protect and restore forests in the cacao value chain, improve livelihoods for producers and help consolidate the peace process in Colombia.

Iniciativa Cacao, Bosques & Paz Colombia

CERO DEFORESTACIÓN CACAO

CERTIFIED JAGUAR FRIENDLY™

PILLAR 2

SOCIAL

Rural Development, Communities and People's Wellbeing

"The heart of Chuculat are the families who grow cacao"

CHUCULAT

BUILDING WELLBEING IN THE TERRITORY

FAIR PRICE AND RESPONSIBLE SOURCING

- Direct purchase without intermediaries
- Stable price above the conventional market

2027: 90% cacao under long-term contracts

TECHNICAL TRAINING

- Workshops on fermentation, drying and post-harvest
- Personalized on-farm feedback

2025: 200 trained producers · 2026: +15% fermentation index

RURAL DEVELOPMENT AND ASSOCIATIVITY

- Alliances with Visión Amazonía and Socodevi
- Support for crop renewal and female entrepreneurship

2025: 150 benefited families

DIVERSITY AND INCLUSIÓN

- Priority to women-led associations
- Internal equal opportunity metrics

2025: 35% · 2027: 50% female participation

CACAO BAR · FACTORY · EXPERIENCES

CASA CHUCULAT

SOBRE NOSOTROS

WHAT IS IT?

Educational space combining factory, tasting, training and cacao culture in Bogotá. A direct bridge between the rural producer and the urban consumer.

- Guided tastings and bean-to-bar workshops
- Talks on origin, history and sustainable practices
- Gastronomic tourism for conscious consumers
- Emotional connection producer ↔ consumer

IMPACT AND INDICATORS

5,000

visitors/year · Target 2025

Casa Chuculat

open public space in Bogotá

2026

Permanent educational program "From Bean to Bar"

Consumer

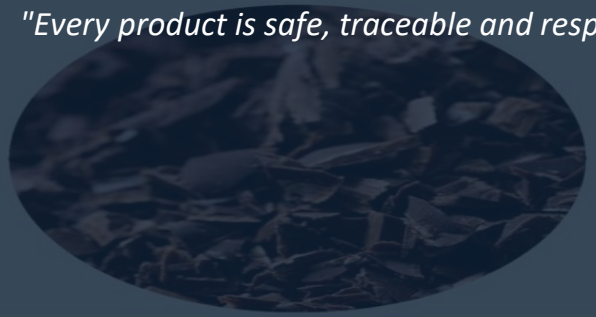
conscious: knows the origin of their chocolate

PILLAR 3

GOVERNANCE

Ethics, Quality and Integrity in the Cacao Chain

"Every product is safe, traceable and responsible — no exceptions"



TRANSPARENCY FROM START TO FINISH

QUALITY AND SAFETY

- INVIMA compliance + HACCP system
- Controls at reception, roasting and tempering
- Internal audits + laboratory testing per batch

2025: External audit · 2027: Digital quality system

TRACEABILITY

- Tracking from origin: producer, association, region
- Batch codes traceable back to the farm

2025: 100% batches published · 2026: QR on packaging

INNOVATION

- Formulations without additives, natural ingredients
- Sensory, regulatory and sustainability evaluation

2025: 3 new responsible products

CONTRIBUTION TO THE SUSTAINABLE DEVELOPMENT GOALS

SDG 1 No Poverty	Direct purchase generates stable income in vulnerable rural areas
SDG 2 Zero Hunger	Technical training + agroforestry + fair prices
SDG 5 Gender Equality	Prioritizes associations with rural female leadership
SDG 8 Decent Work	OSH system, formal employment and rural opportunities
SDG 12 Responsible Consumption	Sustainable packaging, food safety and consumer education
SDG 13 Climate Action	Efficient logistics, energy savings and water management
SDG 15 Life on Land	Zero deforestation, agroforestry and Cacao Forests & Peace Agreement

CHUCULAT

ROADMAP — COMMITMENTS 2025–2027

2025

- 200 trained producers
- 100% batches with published origin
- 60% recyclable packaging
- 5,000 visitors at Casa Chuculat
- 0 disabling accidents

2026

- 80% cacao from agroforestry systems
- Traceability QR code on packaging
- 100% sustainable packaging
- Sustainability price floor active
- -10% energy consumption at plant

2027

- 90% cacao under long-term contracts
- External environmental audits
- 50% female participation in programs
- Digital quality system with batch tracking

CHOCOLATE BARS

Made with cacao from different regions of Colombia, in concentrations ranging from 60% to 100% cocoa solids. Each bar reflects the identity of its origin, highlighting unique sensory profiles and the diversity that defines Colombian cacao.

Bar 60% Cauca, 80g

Bar 65% Casanare, 80g

Bar 72% Caquetá, 80g

Bar 77% Tumaco, 30g

Bar 75% Caquetá with panela, 80g

Bar 75% César with Sea Salt, 30g Y 80g

Bar 85% Arauca, 80g

Bar 100% Caquetá, 80g

CHOCOLATE BARS

Filled bars that combine Amazonian cacao with local ingredients such as sacha inchi, açaí, and copoazú. Includes Copolate, made from copoazú seeds — a unique product that embodies innovation, sustainability, and the potential of Amazonian fruits.

Amazonian Bar 70% filled with Açaí – 96 g

Amazonian chocolate 70%, filled with açaí, a purple berry rich in antioxidants. A unique flavour from the rainforest.

Amazonian Bar 70% filled with Sacha Inchi 96 g

Amazonian chocolate 70% with a creamy sacha inchi filling, a seed rich in omegas. Crafted with cacao from local communities.

Copoazú Bar 80% 80g

Bar made from copoazú seeds, a close relative of cacao. With a fruity and intense profile, it reflects the richness of the Amazon.

MINI-CHOCOLATE BARS

Mini chocolate bars in different percentages and flavours, featuring unique combinations to taste, share, or gift. Available in 120 g presentation.

Chai Mini bar

70% chocolate with cinnamon, clove, turmeric, pepper, ginger, and anise.

Amazonian Chili Mini Bar

70% chocolate with Amazonian chili flakes—spicy and exotic.

Coconut Mini bar

70% chocolate with dehydrated coconut, smooth texture, and delicate flavour.

Passion Fruit Mini bar

White chocolate with freeze-dried passion fruit, fruity aroma, and vibrant acidity.

CHOCOLATE DRAGEES

Chocolate-coated centers, ideal as a snack.
Available in 50 g and 120 g presentations, depending on the product.

Cacao Dragee x 50g
Roasted cacao beans, caramelized and coated with 65% dark chocolate.

Cashew Dragee x 50g
Cashew nuts from Vichada, coated with 65% dark chocolate.

Cranberry Dragee - 120 g
Dehydrated cranberries coated with white chocolate blended with freeze-dried blackberry.

Quinoa Dragee x 50g
Quinoa grown in the Colombian Andes, coated with 53% dark chocolate and a touch of sea salt.

Golden Cacao Dragee x 120g
Roasted cacao beans coated with golden chocolate, made from white chocolate sweetened with panela.

Coffee Dragee - 120g
Roasted coffee beans coated with 80% copoazú chocolate.

TRADITIONAL CACAO FOR

BEVERAGES & CEREMONIES

Ideal for beverages, baking, and cacao ceremonies. Made with natural cacao, intense and versatile in flavor.Available in 200 g and 1 kg presentations.

100% Drinking Chocolate
Pure cacao mass from Caquetá origin, no added sugar.

Chocochai
100% cacao mass blended with spices: cinnamon, ginger, turmeric, anise, clove, and pepper.

CASHEW PRODUCTS

Cashews from Vichada — a natural delight. Responsibly grown, with intense flavour and high nutritional value. Ideal for snacks and creative recipes. A versatile and healthy option.

Cashew Cream
100% cashew spread.
Single ingredient.
Presentation: 220 g

Cashew Nuts
Presentations:
100g, 500g y 1Kg

CHOCOLATE SPREAD

Úntela
Cashew and cocoa spread.
Presentation: 220 g

PROFESSIONAL

USE

Products available in large formats and bulk packaging, ideal for bakeries, chocolatiers, restaurants, and food businesses.

Roasted Cacao Beans
Perfect for coating (drageeing) or making your own chocolate from scratch.

Cacao Nibs
Roasted, Dehusked, and Cracked Cacao

Cacao Liquor (100%) - Grated
Whole, non-defatted cacao mass. Grated for easy melting. Ideal for chocolate-making, baking, or beverages.

Chocolate Couverture
For crafting confections, bonbons, pastries, and other chocolate-based creations. Perfect for professional chocolatiers and pastry chefs.

WE MAKE CACAO A FORCE FOR TRANSFORMATION

"We know that behind every cacao bean there are stories of resilience, of territories seeking alternatives, and of families who find in this crop an opportunity to grow, protect their forests and build their future."

— Manuel Vicente Tejada Iraizoz · Director, Chuculat

We protect the forests where cacao grows

We create shared value with those who grow it

Quality and sustainability always go hand in hand

www.chuculat.com · @chuculatcol · mtejada@corporativoca.com

Thank you!

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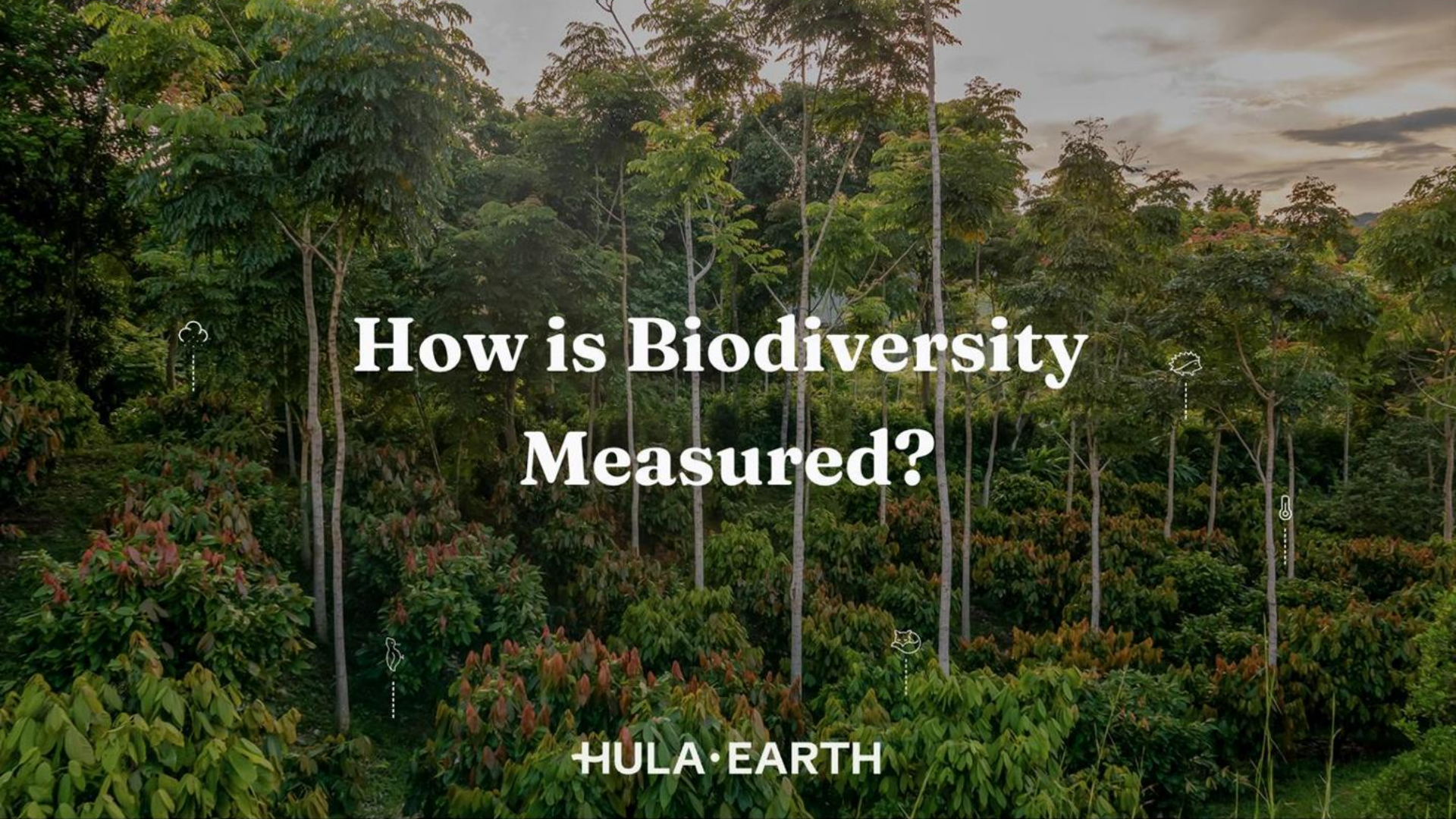
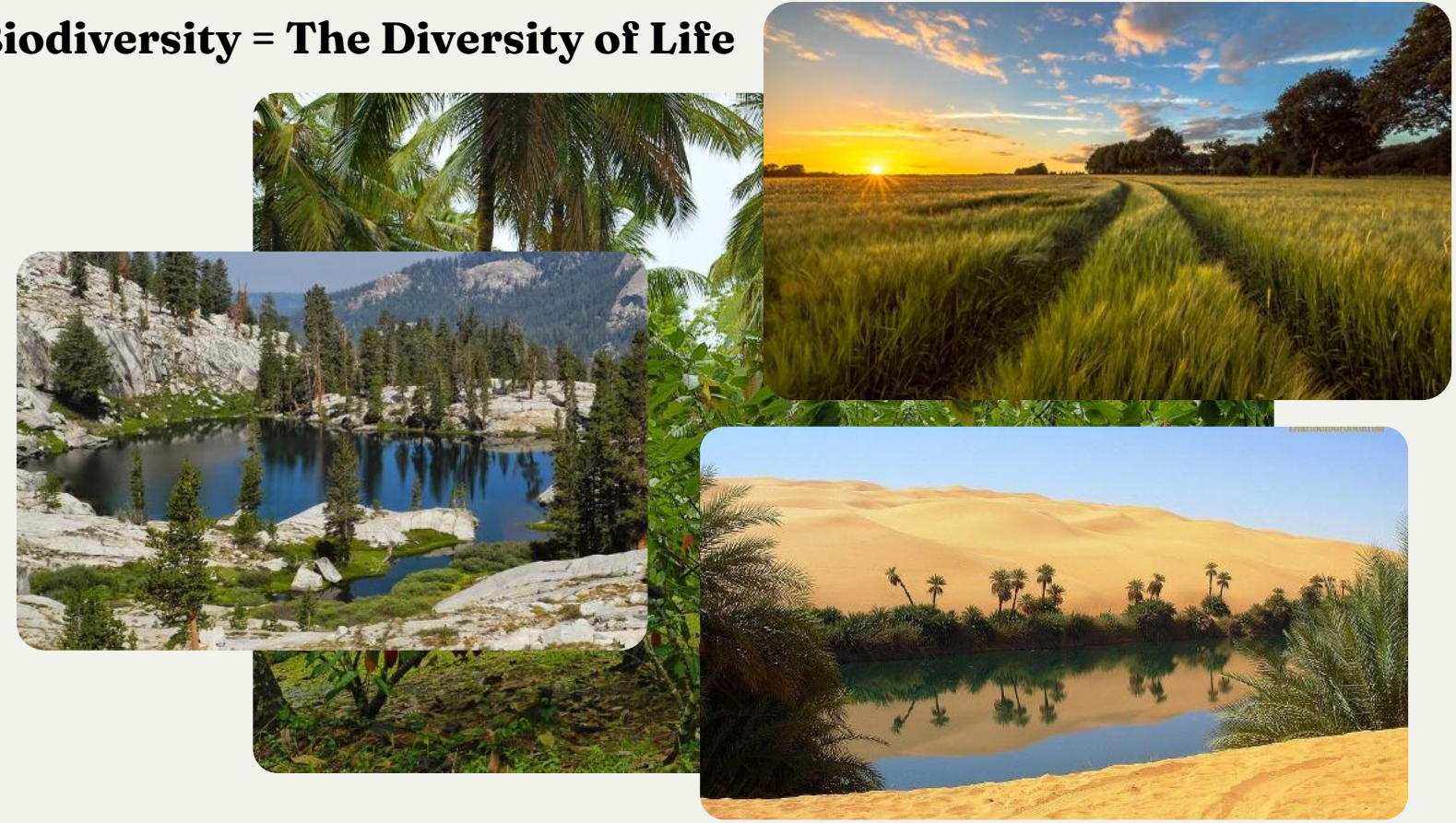

How is Biodiversity Measured?
HULA·EARTH

HOW BIODIVERSITY IS MEASURED

Biodiversity = The Diversity of Life



HOW BIODIVERSITY IS MEASURED

These Are the Biodiversity Dimensions That Matter Most

Genetic Diversity

→ Variation within species

Species Diversity

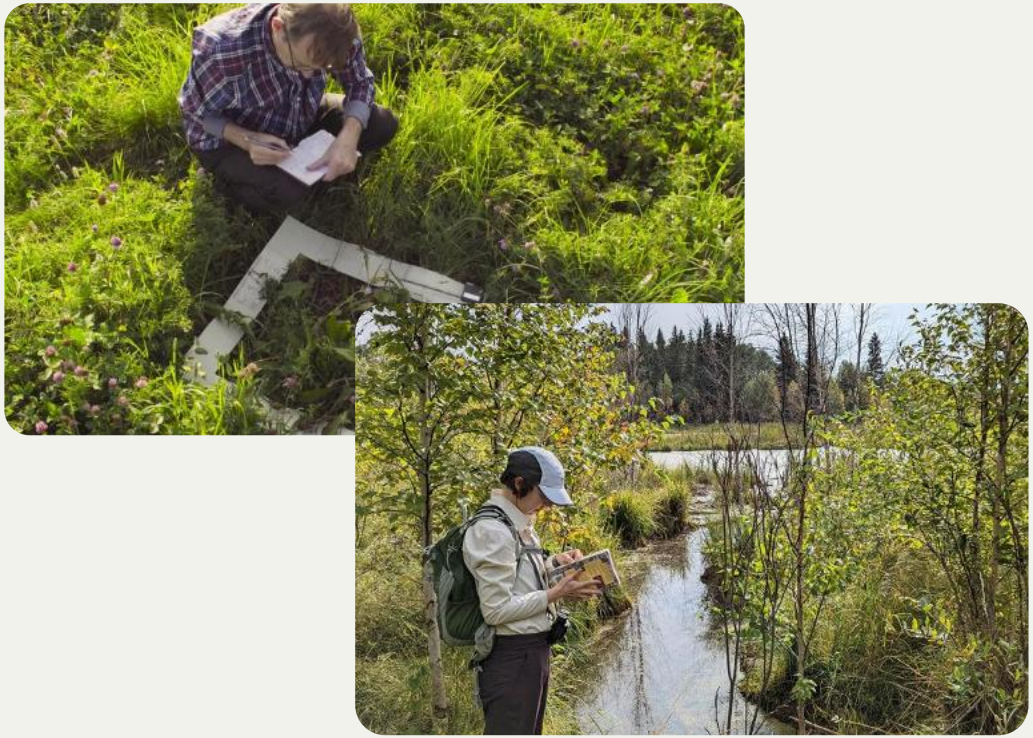
→ Number of species (Species richness)

Ecosystem Diversity

→ Variety of different habitats within an area

HOW BIODIVERSITY IS MEASURED

Method 1: Send People Into the Field



TRADITIONAL SURVEYING

Established method for species & ecosystem diversity

But...

- Time-intensive, hard to scale
- Only a snapshot

HOW BIODIVERSITY IS MEASURED

Method 2: Let the DNA Do the Talking

ENVIRONMENTAL DNA

Extensive data for genetic & species diversity

But...

- Lab processing is inefficient and expensive
- Only a snapshot

HOW BIODIVERSITY IS MEASURED

Method 3: Look From Above

REMOTE SENSING

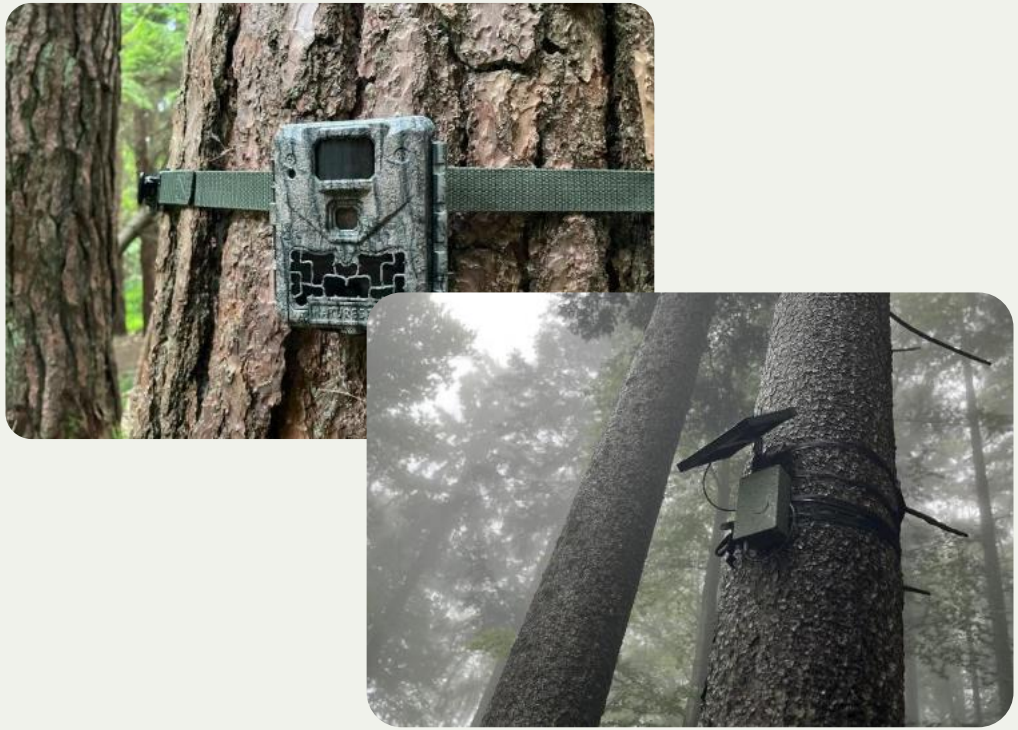
Great for a broad overview of ecosystem diversity

But...

Too coarse for fast changing dynamics & species level

HOW BIODIVERSITY IS MEASURED

Method 4: Let Sensors Listen and Watch



SENSORS

Wildlife Cameras

- Everything big enough that moves (Mammals)

Bioacoustic sensors

- Anything that makes distinct noise (Birds, bats, insects, amphibians...)

HOW BIODIVERSITY IS MEASURED

Hula Earth: A Combined Approach

ON-SITE

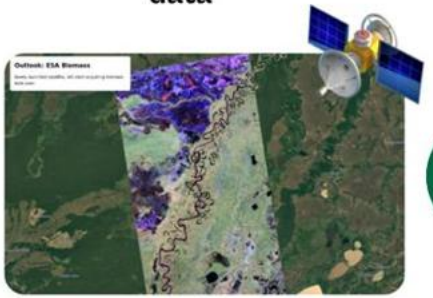
A permanent real-time sensor network for biodiversity

- Based on bioacoustics
- Species richness & triangulation
- Microclimate and CO_2
- Fully autonomous

+

REMOTE SENSING

Monthly insights from multispectral satellite and LiDAR data



- Plant vitality and stress detection
- Plant water content
- Ecosystem diversity

=

PLATFORM

Scalable and auditable biodiversity data

- Ecosystem monitoring and management evaluation
- Real-time biodiversity indicators
- CSRD-compliant species lists at the click of a button

We have the data. Now what?

HOW BIODIVERSITY IS MEASURED

Simplifying Ecosystem Health

→ **Ideal Scenario:** One single value for ecosystem health comparable over regions

SPECIES RICHNESS

→ Baseline species richness

→ Compare with present state

Relative species richness:

Current species / Historically present species

INDICATOR SPECIES

→ Presence of certain species

→ Species act as proxies for habitat health

→ E.g. common bird index (EU Nature Restoration Law)

https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-regulation_en

HOW BIODIVERSITY IS MEASURED

In Practice: Biodiversity in Cocoa

MONOCULTURE

<25 bird species
...mostly generalists

AGROFORESTRY SYSTEM

>50 bird species
...mostly specialists

HOW BIODIVERSITY IS MEASURED

Understand the Complexity

→ Understand what you need and want from monitoring the environment

→ Don’t overcomplicate, but don’t simplify too much

→ Ensure impact

!

We might never fully understand everything that happens in an ecosystem.

Cultivating Tomorrow: Biodiversity as the Foundation for Sustainable Agriculture.

HULA · EARTH

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Financing Biodiversity-friendly Supply chains in Cocoa Cultivation

The role of nature finance. What works, what doesn't?

May 2026

THE LANDBANKING GROUP

1. Many challenges related to nature in cocoa, both on demand and supply chain

Supply chain

Production-side pressures

- Deforestation & biodiversity loss
- Soil degradation & water stress
- Climate change impacts on yields
- Aging tree stock & slow replanting cycles
- Smallholder vulnerability & limited access to credit
- High supply volatility

Demand

Market-side signals

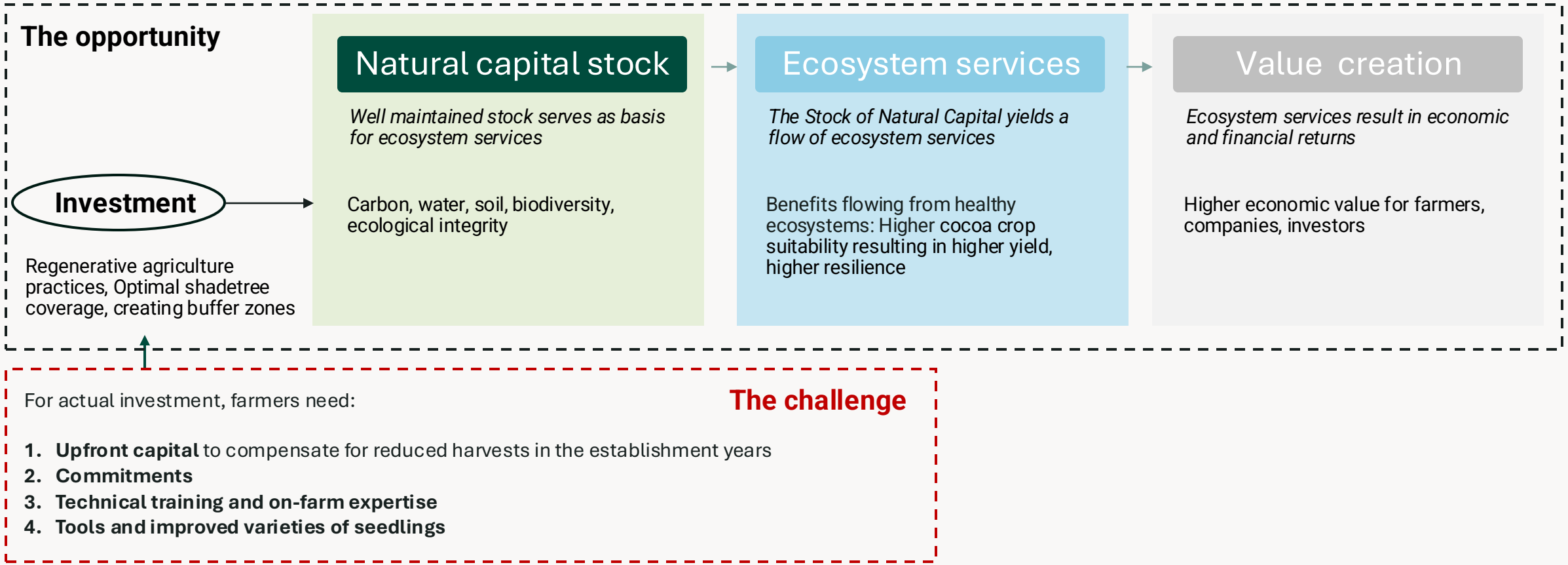
- EUDR & tightening traceability requirements
- Brand & consumer pressure for deforestation-free sourcing
- High price volatility
- Desire for Supply chain resilience & long-term sourcing security
- Living-income commitments reshaping procurement

Capital & finance

Investment-side barriers

- Traditional financial models fail to incentivize sustainability
- Upfront costs with delayed, uncertain returns
- Benefits often accrue to different parties than those paying
- Incipient risk-pricing of nature-exposed capital
- Elevated lending risk to volatile supply chains

1. Investing in natural capital delivers value for all stakeholders in the supply chain but farmers need money, commitments and expertise to transition



2. Research question:

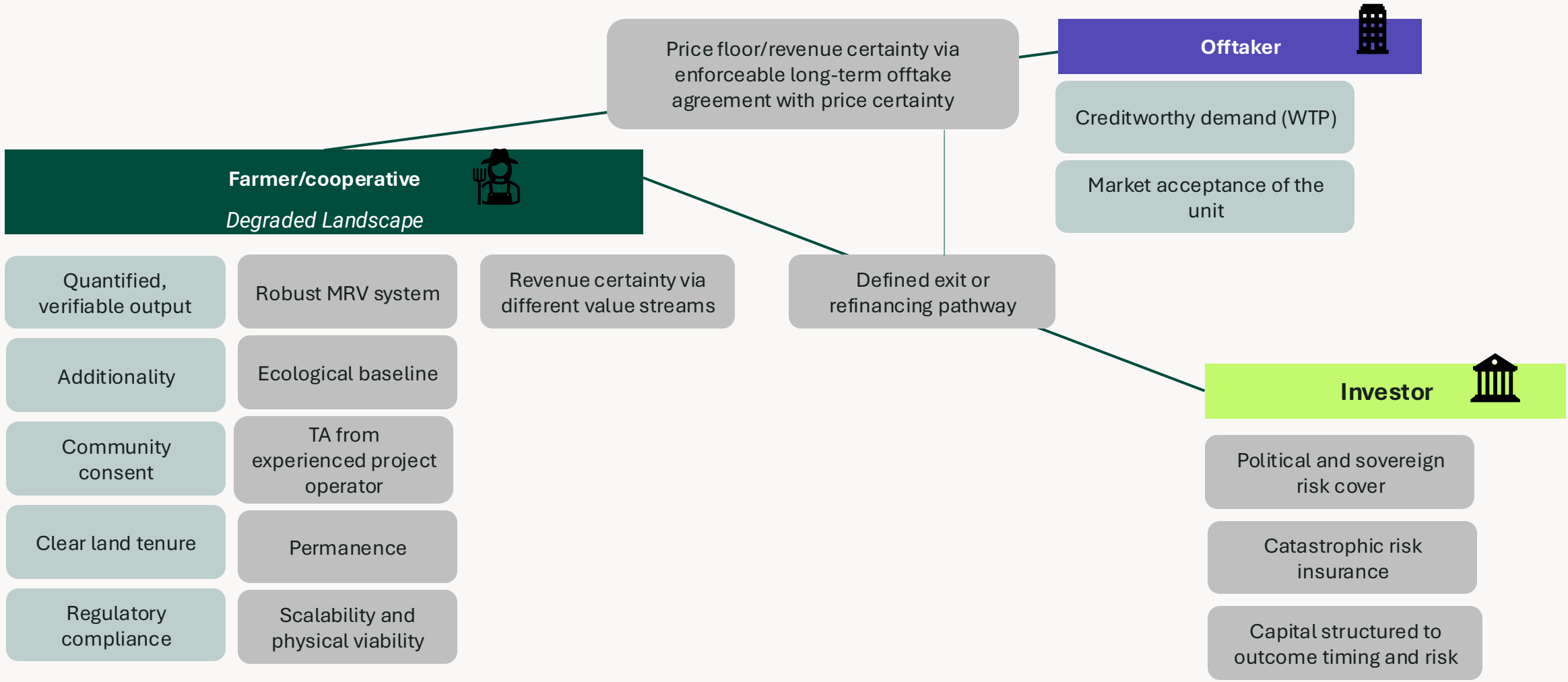
How to support a natural-capital focused transition in the cocoa sector?
How to finance biodiversity-friendly supply chains?

TLG

2. Nature Finance – conditions for success

Necessary conditions

Sufficient conditions



2. Many project-level levers create value for all stakeholders

Non-exhaustive selection of elements

	Farmer/cooperative	Offtaker	Investor
Long-term contract	Secure pre-financing for projects with offtaker agreements	Plannable volume	Confidence for commercial investors
Transparent fair pricing (bottom/ceiling)		Plannable price	
Natural capital payments	Higher revenues and income & plannability	Increased company ESG reputation Capitalize nature payments as intangible assets	Farmer repayment positively influences ROI Financial incentives aligned with environmental & social impact
Shade tree crop sales		Lower sourcing attrition & long-term origin security based on resilient supply chains Potential rewards via 3rd parties (lower cost of capital, superior finance terms)	
Lower input costs			
Higher cocoa yield			
Technical assistance	Higher knowledge about management practices		

3A. Examples from practice: How to finance the transition?

Examples from practice

SITUATION

Belterra's agroforestry model restores degraded land and enhances biodiversity, but scaling is hindered by a lack of financing.

COMPLICATION

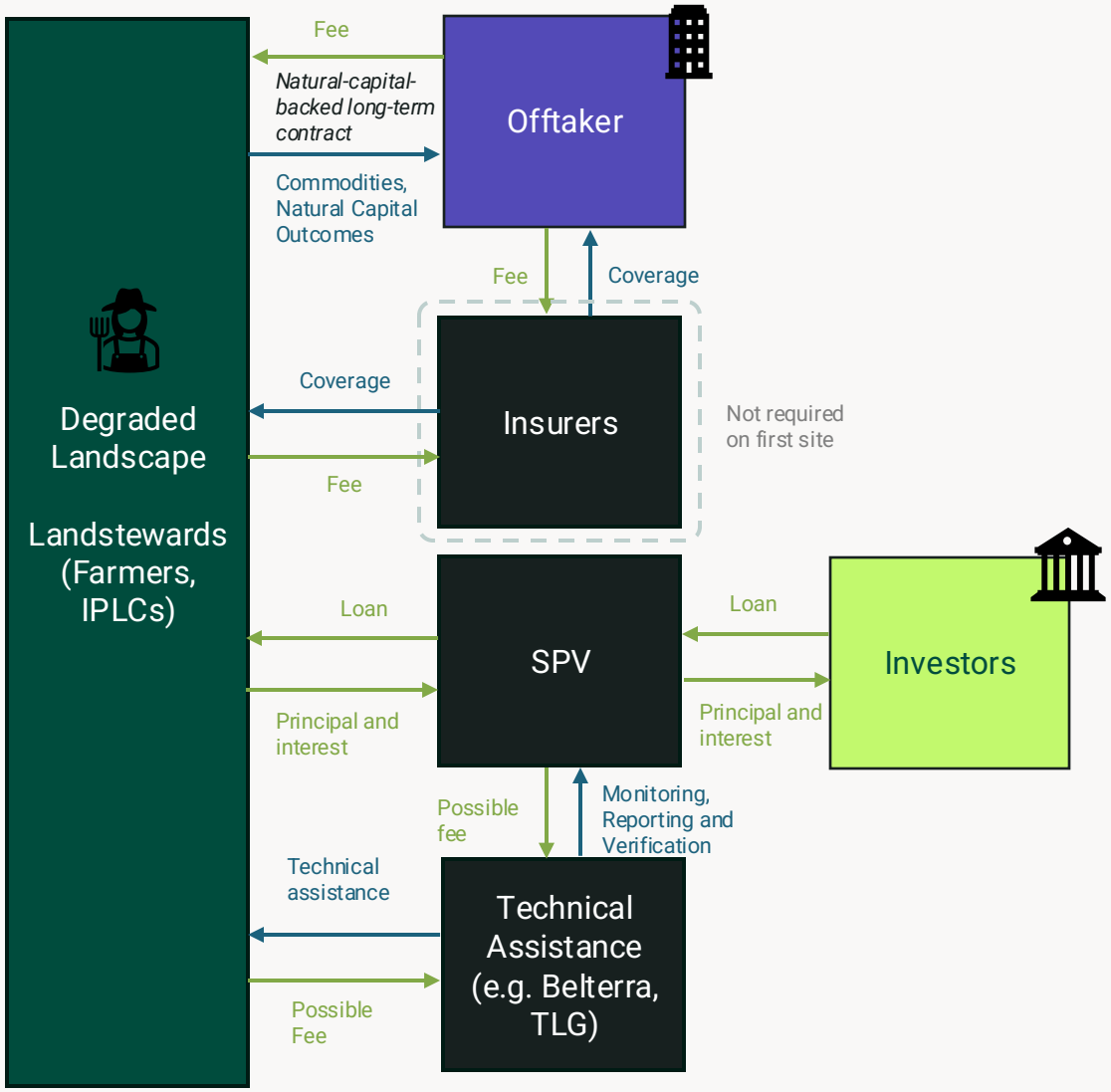
Markets and accounting systems do not recognize the value of restored ecosystems & restoration remains an off-balance-sheet cost.

QUESTION

In which model would Belterra, investors, and cocoa companies all benefit, anchored in a clearly defined and shared value?

SOLUTION APPROACH

- SPV (Special purpose vehicle) restoring the landscape
- Natural capital-backed long-term contracts which include natural capital as an important position to consider



3B. Examples from practice: How to finance the transition?

Examples from practice

SITUATION

Of ~5.9M hectares of cocoa land in Ghana and Ivory Coast, an estimated 30–50% is degraded, amounting to 1.7–3M hectares.

COMPLICATION

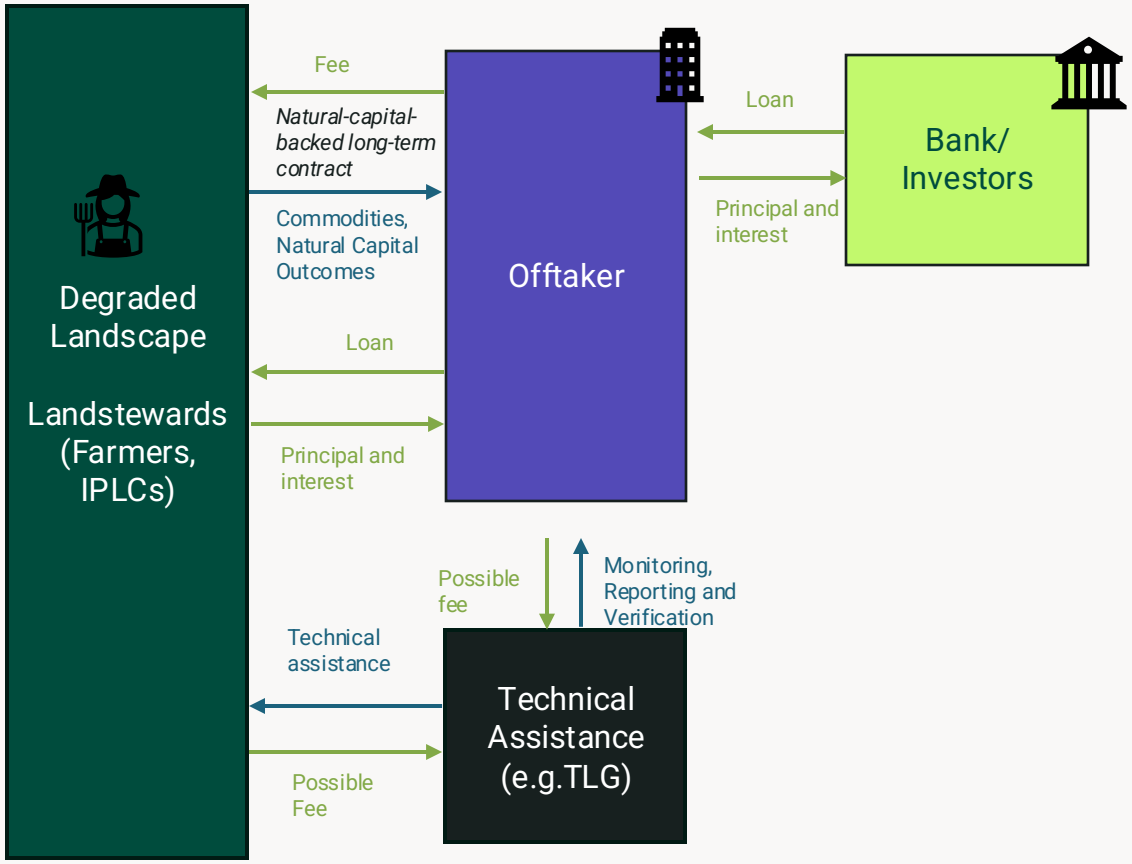
Poverty–degradation trap which traditional finance can't solve: high upfront costs, delayed returns, no collateral;
Tragedy of the commons: no single company will invest in a landscape when competitors can free-ride on the gains.

QUESTION

How can development finance unlock regenerative practices at scale?

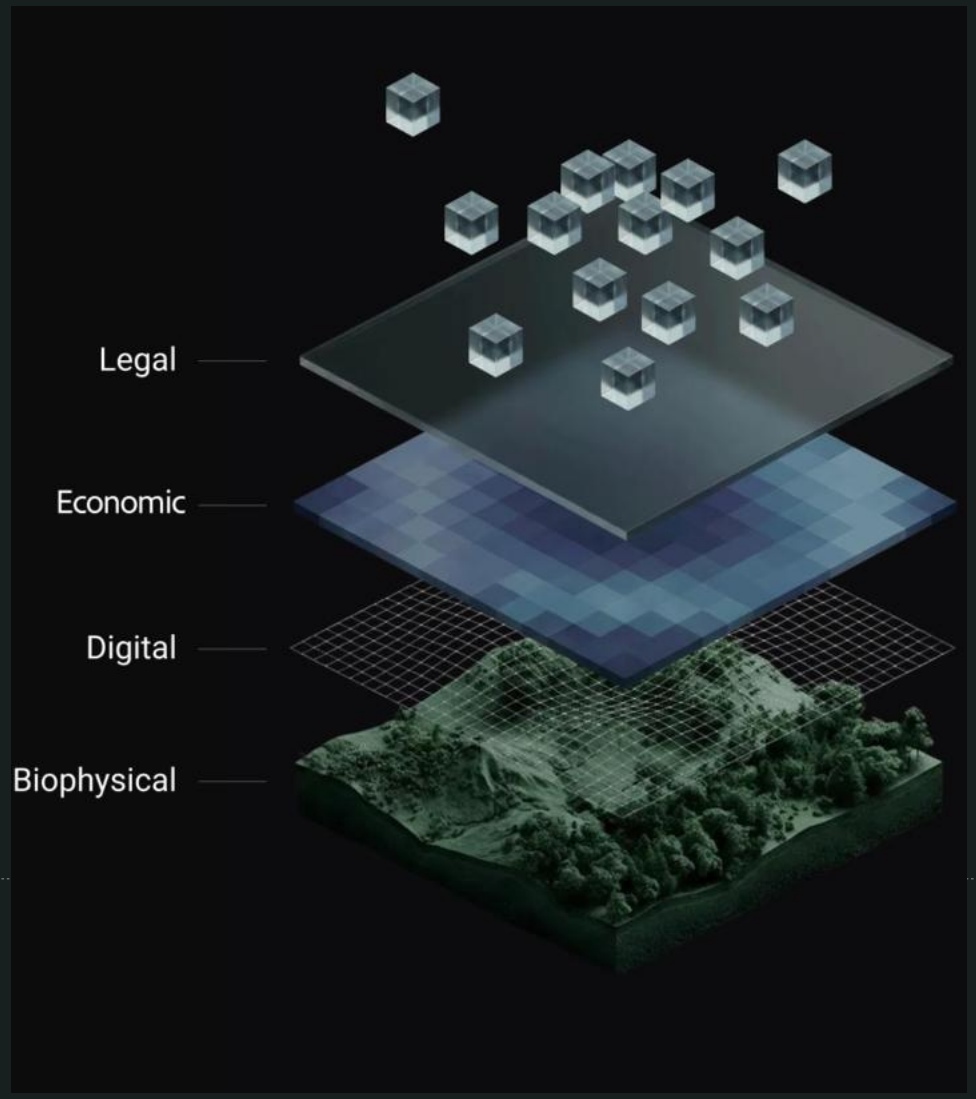
SOLUTION APPROACH

- Nature-linked landscape transition financing via mixed blended finance facility that channels funding (eg. via companies) to farmers for transition
- Outcome-based offtake



4. The Nature Stack.

Value from Nature, for every acre you own, need, touch or steward.



→	Nature-based contracts	*Monetize*
→	Nature Risk Pricing	*Manage*
→	Natural capital accounts & indicators	*Measure*

THE LANDBANKING GROUP

You want to understand the return on nature investment for your company — biophysically and economically?

You want to know whether your supply chain exposure can be turned into a bankable natural capital asset?

You want to design the contracts, the finance structure, and the MRV layer that make this real — not just a pilot, but at scale?

We are looking forward to hearing from you!

Lena Luepken
Strategics Project Manager
The Landbanking Group

lena.luepken@thelandbankinggroup.com

Backup

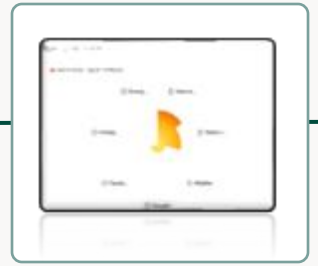
Exemplary Agri journey to value

Step 1. Define value roadmap and goals e.g. impact reporting or resilience improvement

Goal to improve resilience by 5%

Step 2. Map your land assets and **onboard** them on the Landler platform

20 plots uploaded, overall 10,000 ha



Step 3. Quantify **biophysical impact** a) Understand state of nature (resilience) with current and historical data for each asset at plot and landscape level b) Identify risks: Evaluate vulnera-bilities like heat stress

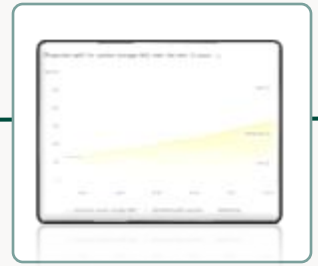
Heat risk endangering harvests. Water holding capacity steady.

Step 4. Communicate to relevant stakeholders (investors, shareholders, suppliers etc.)

Medium Water holding capacity.

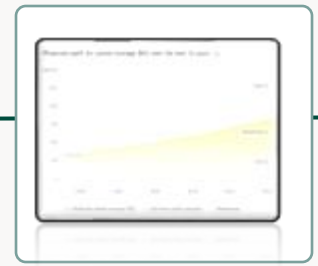
Step 5. Portfolio management: Forecasting and scenario mapping; Options for investment; Return on investment calculator

More Soil Organic Carbon possible.



Step 6. Implement **targeted improvements on the ground** (e.g. via incentivizing improvements) and and continue to monitor

Increased Soil Organic Carbon: Potential for higher yields



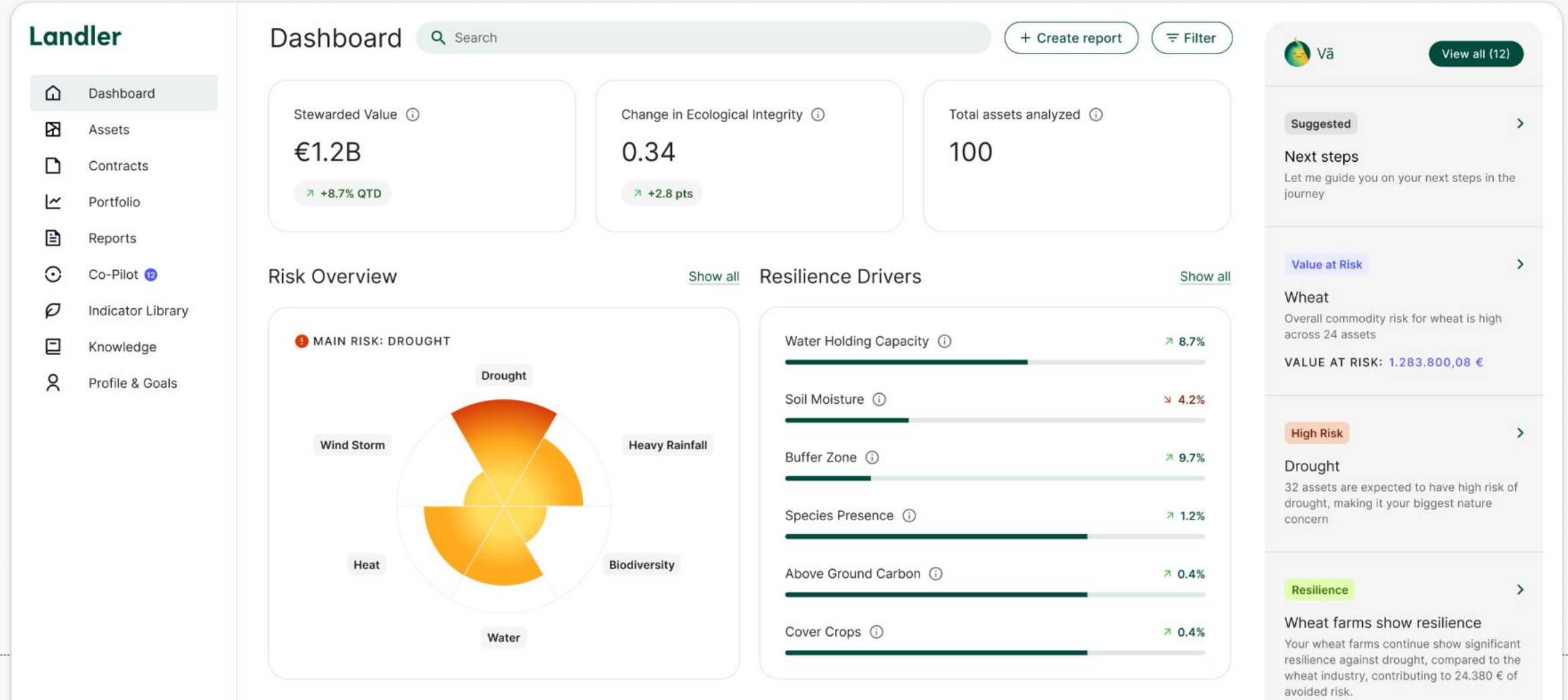
Step 7. Realize monetary value (e.g. via higher resilience) and report

Monetize resiliency

Manage land – plan & implement

Impact Reporting (Outcome-based)

Landler: The end-to-end platform to manage natural capital at any scale



Indicators on Landler

Biodiversity

AVAILABLE NOW

- Habitat Intactness
- Ecosystem Integrity Index (EII)
- Deforestation
- Species Occurrence
- Threatened Species Presence
- Protected Areas in Vicinity (WDPA)
- Protected Areas in Vicinity (Open Data)
- Natural Habitat
- Vegetation Condition

BUILT ON DEMAND

- Canopy Height
- Biodiversity In-situ Pack
- Indicator Species
- Invasive Species
- Landcover / Landuse

Carbon

AVAILABLE NOW

- Soil Organic Carbon (Stock)*
- Soil Organic Carbon (AI model)*
- Soil Organic Carbon (Change)*
- Above Ground Carbon (High Resolution)
- Above Ground Carbon (Low resolution)

BUILT ON DEMAND

- Carbon In-situ Pack
- Carbon Accounting Integration
- Carbon Flux Estimate (IPCC Tier 1)

Soil

AVAILABLE NOW

- Cover Crops

BUILT ON DEMAND

- Soil In-situ Pack
- Soil Biology+ Pack
- Soil Resilience Index
- Soil Physics+ Pack
- Soil Chemistry+ Pack
- Soil Microbes
- Soil Biodiversity
- Topsoil pH
- Crop Suitability
- Soil Properties
- Soil Retention / Erosion

Water

AVAILABLE NOW

- Soil Moisture Dynamics & Trend*
- Precipitation*
- Water Holding Capacity (High Resolution)*

BUILT ON DEMAND

- Water In-situ Pack
- Water Resilience Index
- Water Surface Temperature
- Surface Water
- Water Holding Capacity (Low resolution)

Social

AVAILABLE NOW

- Indigenous Areas
- Population Density
- Life Expectancy

BUILT ON DEMAND

- Social In-situ Pack
- Social Resilience Index
- Governance Pack
- Livelihood Pack
- Health Pack
- Education Pack
- Amfori Social Risk

Auxiliary

AVAILABLE NOW

- Climate Risk

BUILT ON DEMAND

- Auxiliary In-situ Pack
- Surface Temperature
- Air Temperature
- Cooling and Shade

TLG

EII – The structure

Structural Integrity

How physically undisturbed or fragmented is the landscape?

Functional Integrity

How well is the ecosystem functioning in comparison to an unmodified state?

Compositional Integrity

How close is the species composition to an undisturbed state?

1

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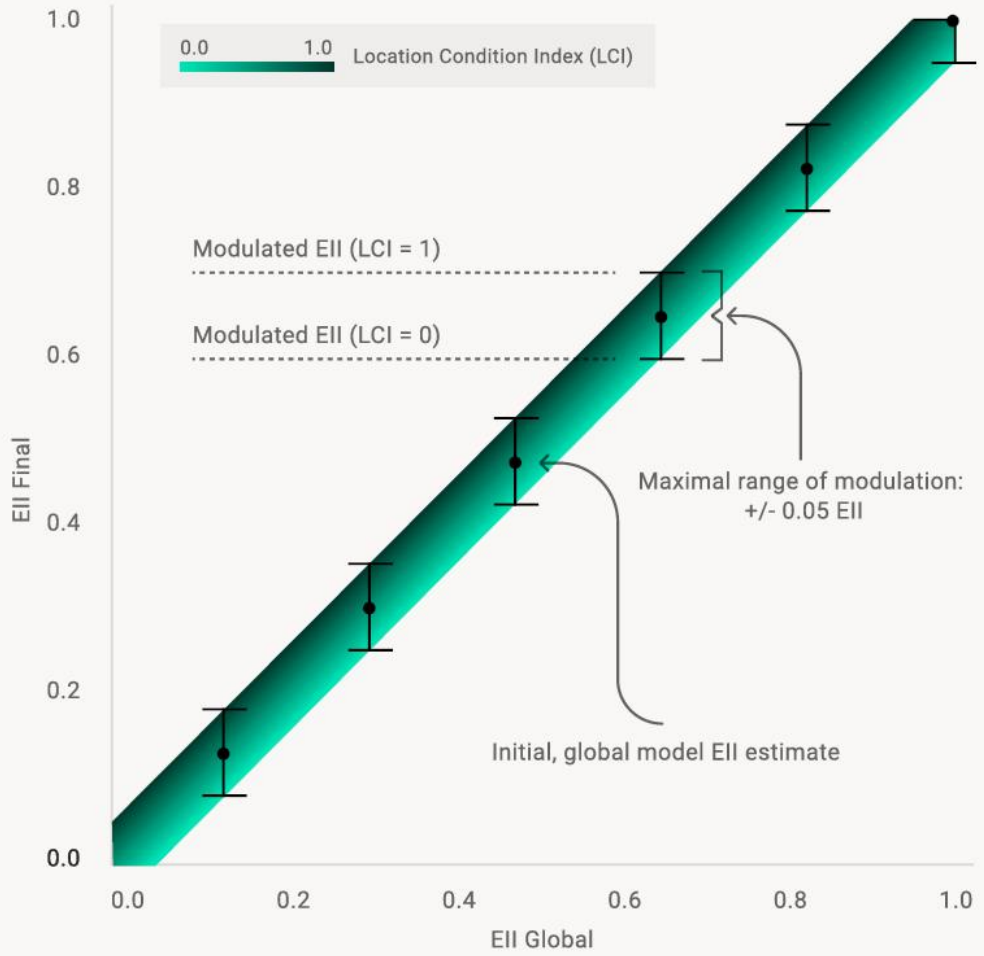
Scientific work by UN-WCMC, implemented and given open access to the public by TLG

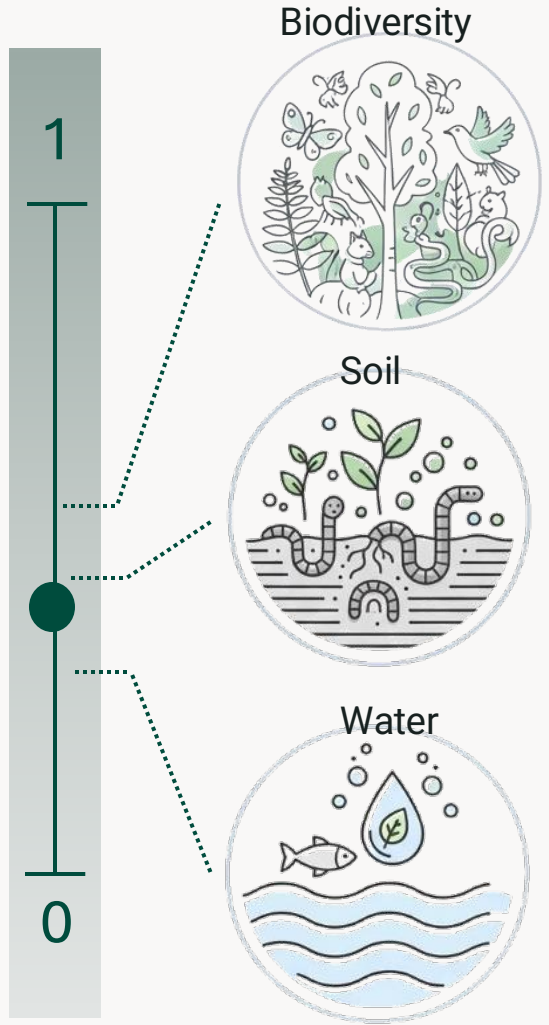
From Global Model to Local Context



Global EII

X

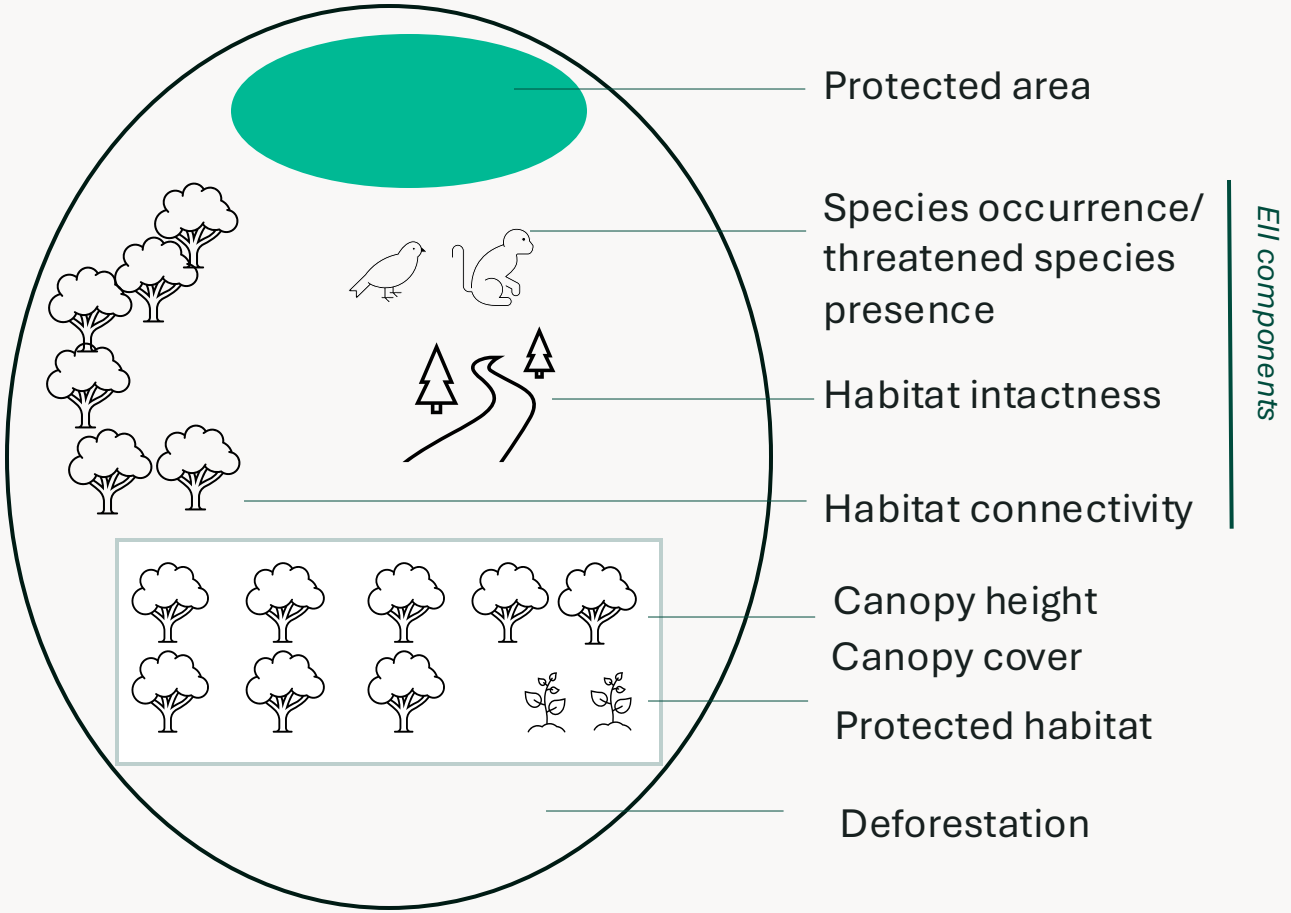
Local Condition



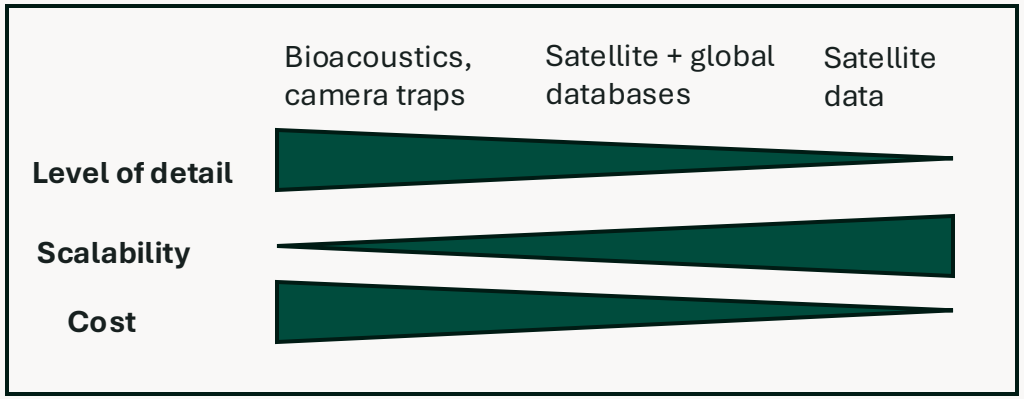
Scientific work and implementation by TLG

Deep dive: Satellite-based biodiversity monitoring

Indicators (exemplary)



Remote vs. on the ground measurements



Satellite-based monitoring is most useful when scalability and low costs needed

We are here to support you understand, measure and manage your Nature dependencies, risks and opportunities – with a positive ROI

The Landbanking Group is:

- A globally active Nature Fintech, advisor and thought leader
- Founded by serial entrepreneurs with decades of relevant experience
- Built by a global, diverse team of experts in Germany, South Africa and Australia

Trusted by international brands

SIEMENS, Ritter Sport, dm, EDEKA, nationalgrid, Bird&Bird, BAIN & COMPANY, ecotone, African Parks, GOLDBECK

Cooperating with world class scientists and verifiers

Stanford Natural Capital Project, universität innsbruck, Lobelia., eci Environmental Change Institute University of Oxford, Preferred by Nature, TÜV SÜD, SGS, CFA Cool Farm Alliance

Aligned with leading frameworks and initiatives

GREENHOUSE GAS PROTOCOL, TNFD Taskforce on Nature-related Financial Disclosures, SCIENCE BASED TARGETS, IAPB International Advisory Panel on Biodiversity Credits