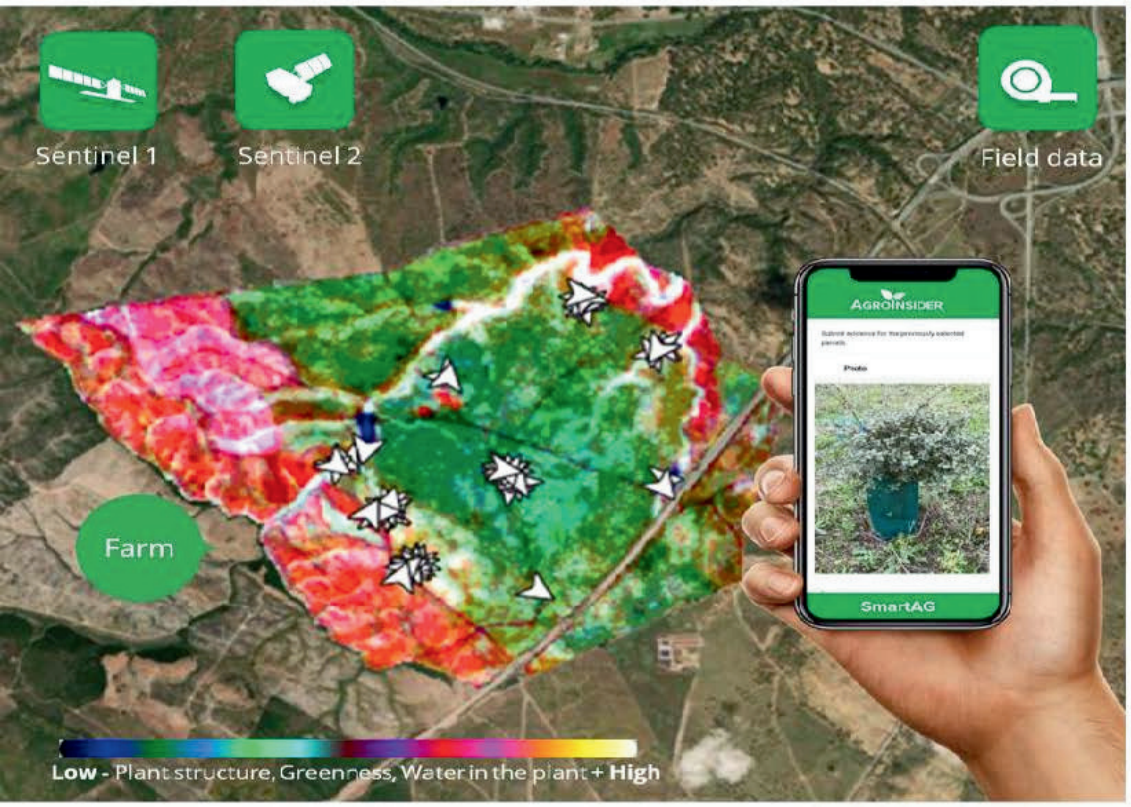
Smart AG
from Agroinsider



About the Smart AG tool

What It Does: Uses Copernicus satellite & field data to monitor, report and verify vegetation growth and health.

Who Can Use It: Anyone managing land (like farmers or forest caretakers), or monitoring carbon sequestration.

Benefits: Helps quickly spot and fix issues on large land areas, saving time and money.

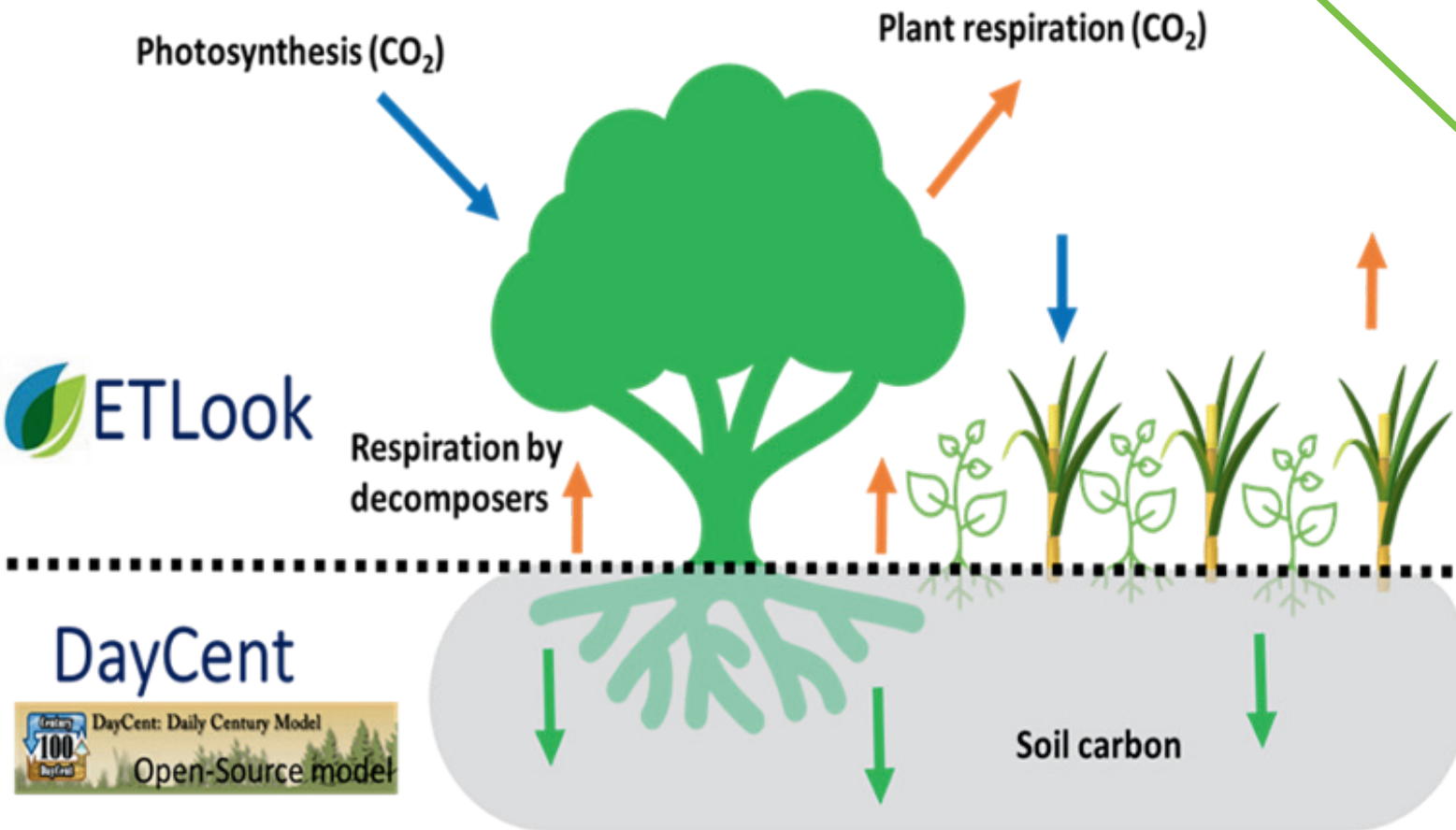
Where we've used it: Spain, Portugal, Ukraine, Indonesia, the Netherlands

Find out more

Email Patrícia Lourenço
patricia@agroinsider.com

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

CMMT-eLEAF model



About the CMMT-eLEAF model

What It Does: Measures plant and soil carbon, combining direct forest measurements, advanced mapping technology, and remote sensing to estimate total carbon storage.

What its good for: Calculating ecosystem productivity and carbon sequestration.

Benefits: Comprehensive, large-scale monitoring of biomass and carbon capture using high-tech models and satellite data.

Where we've used it: United States, South Africa, Burkina Faso, the Netherlands

Find out more

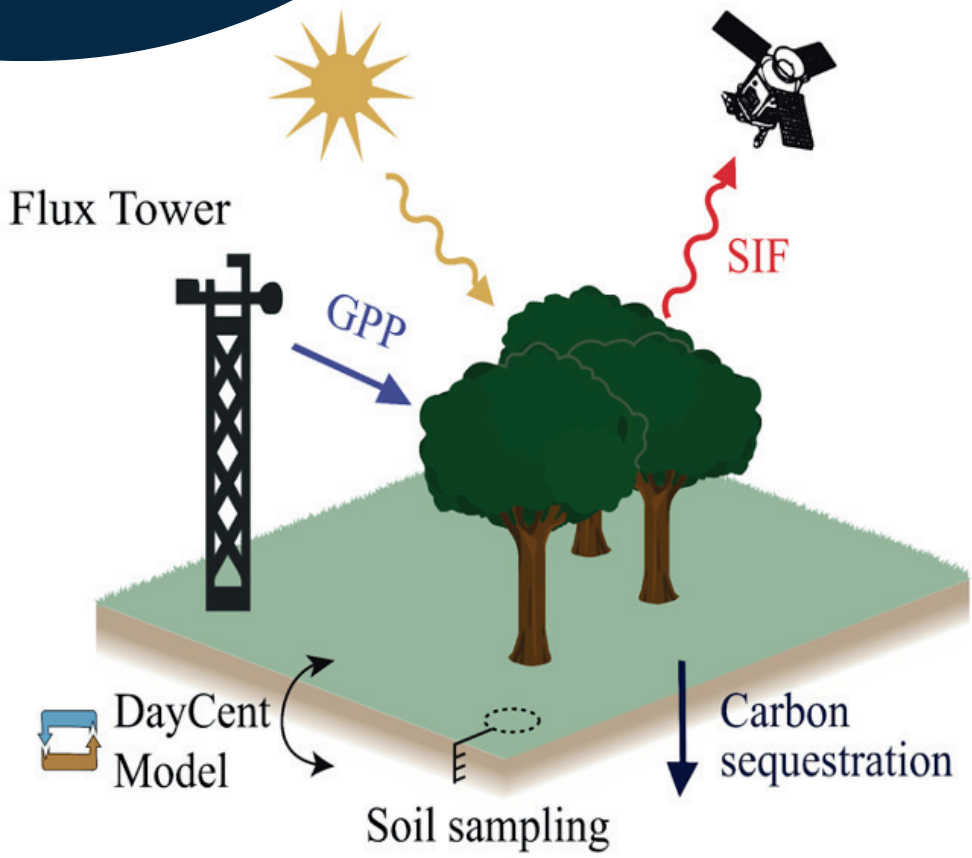
Email Mohamed Ahmed
mohamed.ahmed@eleaf.com

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

SIF-GPP-Carbon Sequestration Model by KNMI

Koninklijk Nederlands Meteorologisch Instituut
Ministerie van Infrastructuur en Milieu

LANDMARC



What It Does: Uses satellite data to track how plants use carbon and how land use changes affect carbon storage globally.

What its good for: Helps understand carbon dynamics on a global scale and supports climate change mitigation efforts.

Limits: Its accuracy relies on the quality of satellite data and specific regional conditions.

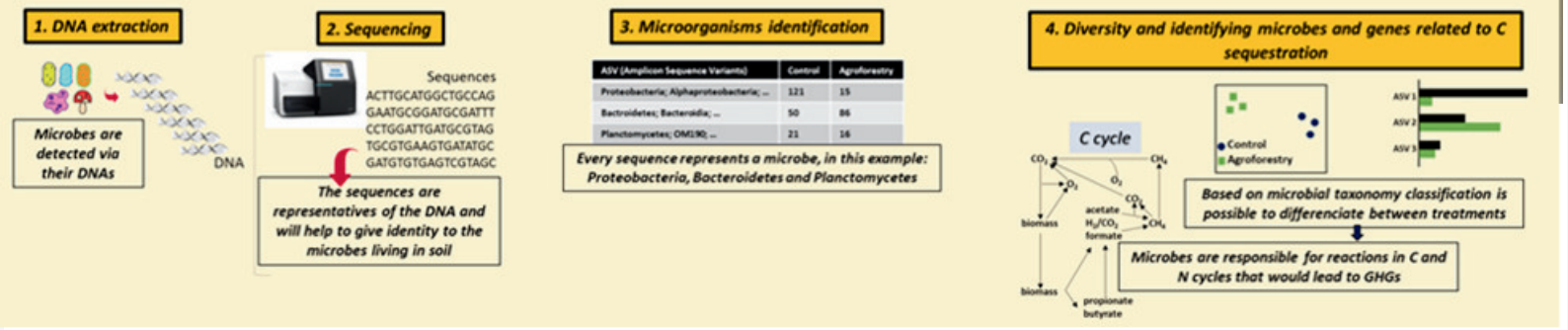
Where we've used it: Australia, China

Find out more

Email Juliëtte Anema
juliette.anema@knmi.nl

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Bioclear Earth Prototype



About the Bioclear Earth model

What It Does: Analyzes soil health using advanced methods to study soil microbes and their carbon storage roles.

What its great at: Provides detailed insights into soil microbial activity and overall soil health.

Limits: The logistics of delivering soil samples and preservation solution outside Europe are challenging.

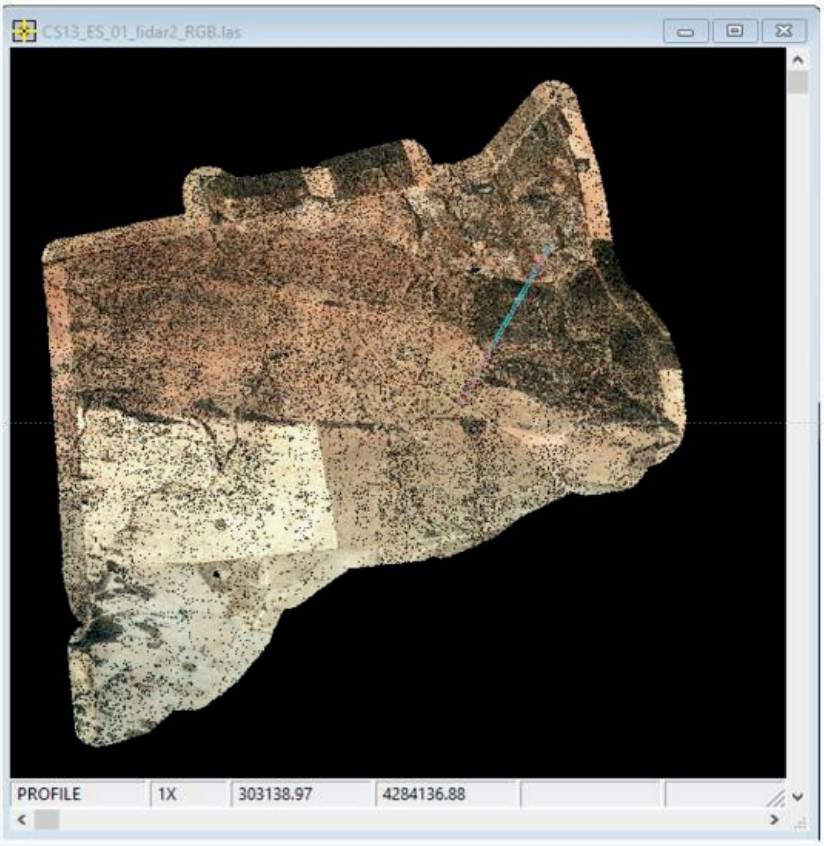
Where we've used it: The Netherlands, Germany, Switzerland, Burkina Faso, Kenya, Canada, Indonesia, Spain, Portugal, Vietnam, Nepal, Ukraine.

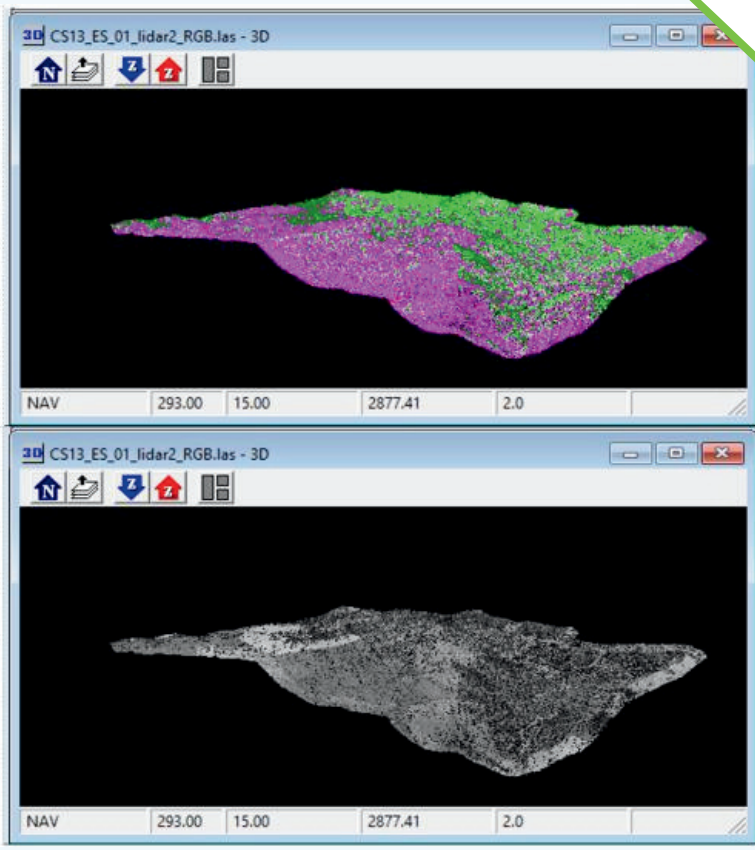
Find out more

Email Afnan Suleiman
Suleiman@bioclearearth.nl

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Field-map Forest Inventory-LiDAR Model





About the model

What It Does: It uses forest measurements and LiDAR remote sensing to convert data on biomass and biodiversity into **carbon storage values**.

Benefits: It's an accessible digital tool. It can evaluate the canopy height of dense forest stands **more accurately** than traditional tools.

Where we've used it: Spain, Portgual and Germany.

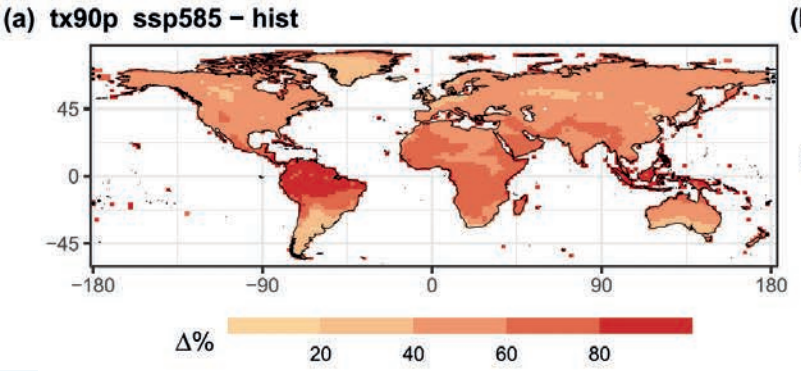
Find out more

Email Federico Julián Fuentes
fjulian.ambienta@gmail.com

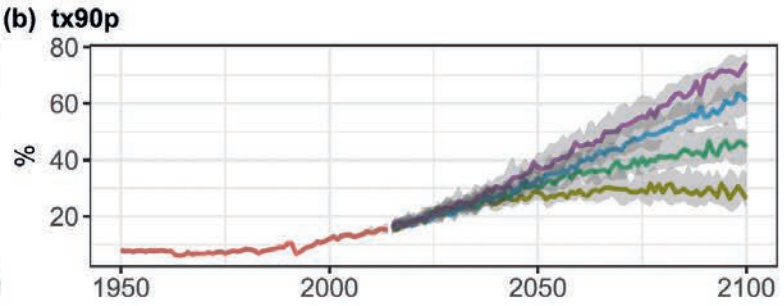
This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Droughts & Heatwaves: A risk analysis

LANDMARC



Map shows median future projected changes in the frequency of very hot days under a strong emissions scenario.



TTime series of the simulated changes for the same heat-related metric, under four future emission scenarios.

We used **25 climate models** and **4 emissions scenarios** to project how much we can expect droughts and heatwaves to change in future.

The bad news: we can expect droughts and heatwaves to get worse, particularly in certain regions.

The good news: Projections show that lowering emissions can still make a big difference when it comes to future droughts and heatwaves.

Read the research

Email Markus Donat
markus.donat@bsc.es

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Regional Engagement:

Are countries collaborating to meet climate goals?

Our methodology

We held **four regional workshops** for Europe, Africa, Asia, and Latin America

Stakeholders were **informed** on baseline and current conditions

With the help of workshop facilitators, they develop **detailed content (based on the table below)**

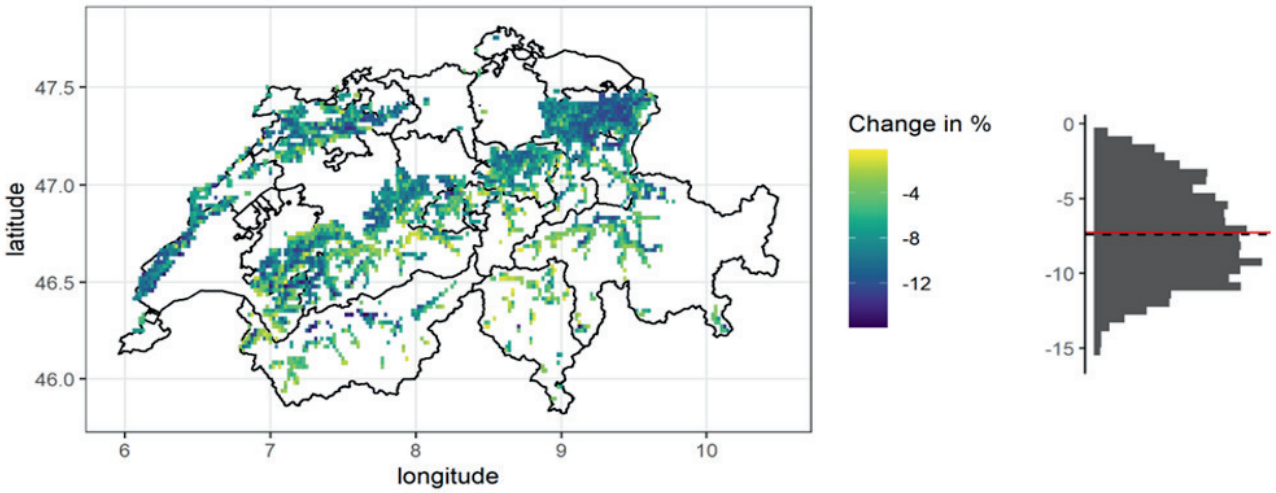
	Climate Ambition		
Regional Engagement	Baseline	Moderate ambition	High ambition
Current	N/A (taken as input)		
Improved	N/A		
High	N/A		

Results coming soon!

Email Francis Johnson
francis.x.johnson@sei.org

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

DayCent



Distributions of annual C sequestration potential and relative grass biomass yield change from implementing silvopasture on permanent grassland in ***Switzerland****.*

About DayCent

What it does: It uses information about the weather, the type of soil, and what the land is used for to predict how much carbon dioxide is released or absorbed by the land over time.

What its good for: Understanding how **specific** land use practices change the soil, especially with respect to levels of carbon and nitrogen.

Where we've used it: the Netherlands, Switzerland, Spain, Portugal, Ukraine, Burkina Faso, Kenya, France, Australia

Find out more

Email Moritz Laub
moritz.laub@usys.ethz.ch

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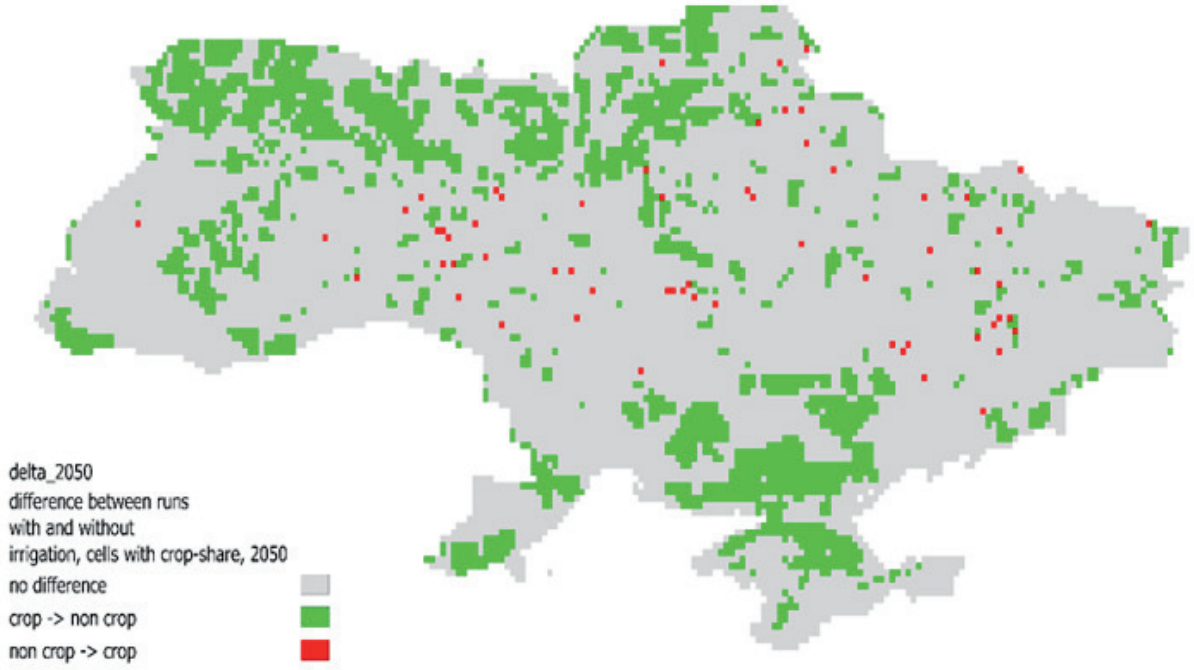
LandSHIFT



*This shows the differences between the "reference scenario" and the "non-irrigation scenario" in **Ukraine**. The upper part shows that (as intended) irrigated cropland is taken out of production (green cells).*

About LandSHIFT

What it does: It predicts how land use might change over time based on different scenarios of population growth, economic development, and environmental policies**.**

What its good for: large-scale, long-term predictions. It can help in planning for sustainable development by showing where pressures on land might lead to environmental degradation or loss of habitat.

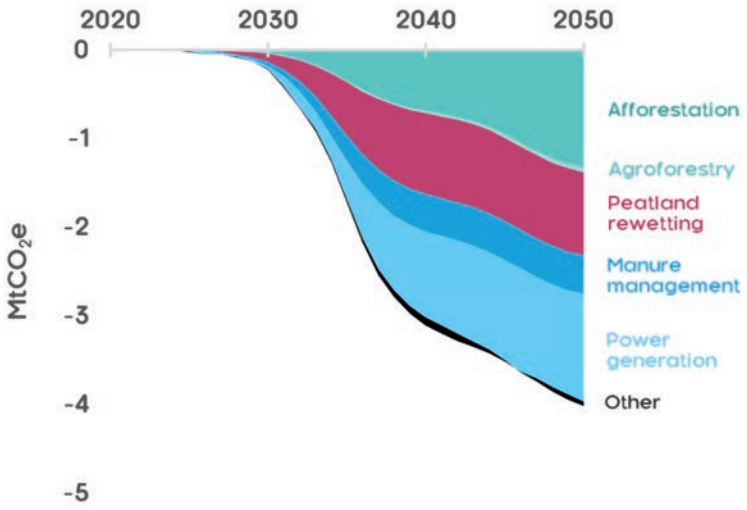
Where we've used it: Ukraine, Indonesia, Burkina Faso, Switzerland

Find out more

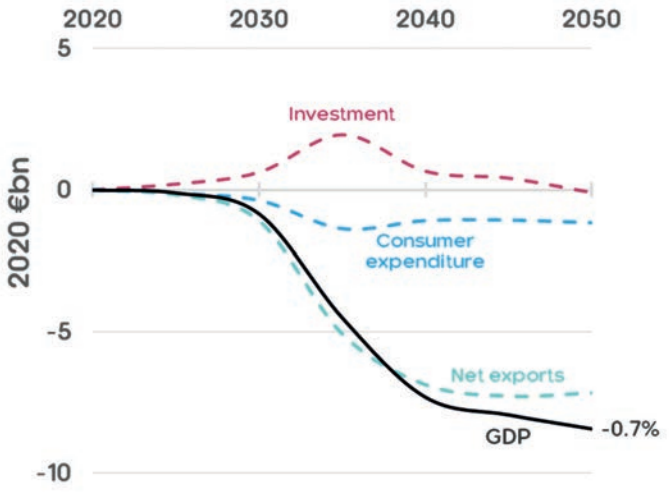
Email Ruediger Schaldach
schaldac@uni-kassel.de

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

E3ME



Scenario GHG emissions impacts by source, absolute difference from baseline, MtCO2e, in ***the Netherlands.***



GDP and components by scenario, 2020-2060, differences from baseline, 2020 € billion and % in ***the Netherlands.***

About E3ME

What it does: It helps us understand how changes in the economy, energy use, and the environment are connected worldwide.

What its good for: Looking at how economy, energy, and environment interact globally. It can predict how green policies or technologies might impact jobs, industries, and emissions.

Where we've used it: The Netherlands, Switzerland, Germany, Sweden

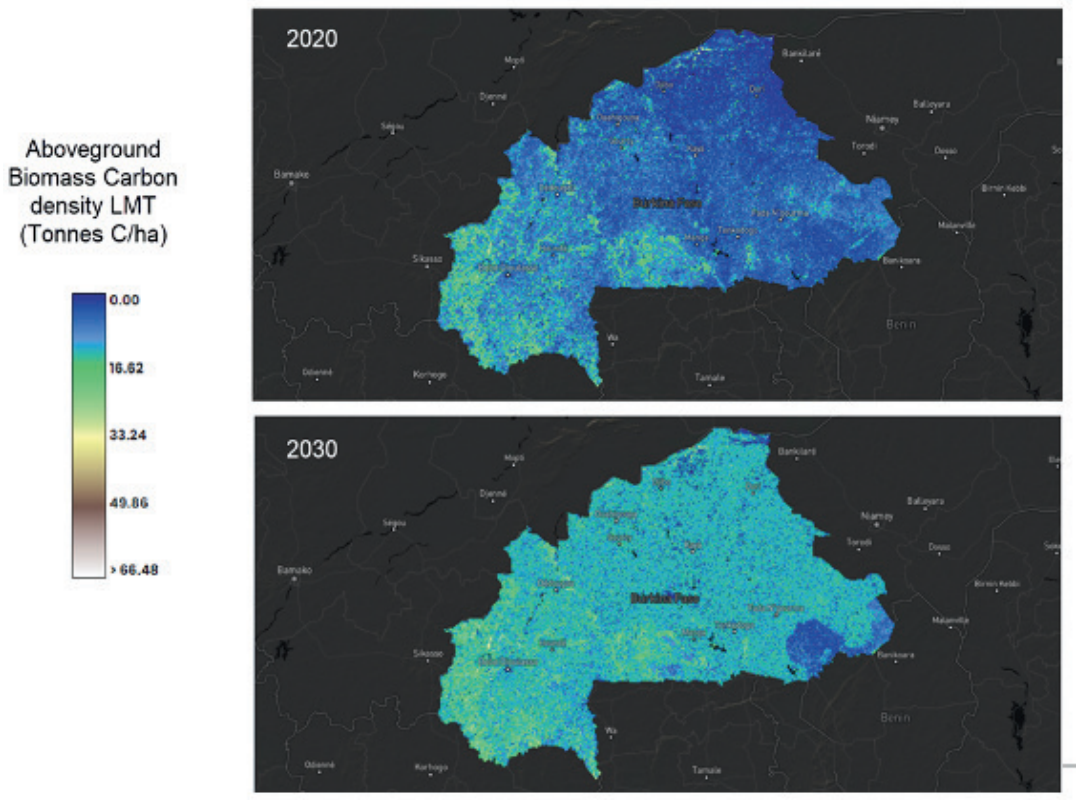
Find out more

Email Michael McGovern
mm@camecon.com

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

ALCES Flow

LANDMARC



ALCES Flow output for our optimistic scenario for ***Burkina Faso.***

About ALCES Flow

What it does: It simulates changes in landscape composition and carbon in response to projected land use changes.

What its good for: Analysing the impacts of various land use scenarios on carbon dynamics and landscape changes.

Where we've used it: The Netherlands, Burkina Faso, Vietnam, Canada, Indonesia, Venezuela, Nepal, Spain, Switzerland

Find out more

Email David Ismangil
D.S.Ismangil@tudelft.nl

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

A Win-Win for Kenyan Maize Farmers

Kenya's maize yields have been stagnating in a way that cuts against the grain of global trends.

But our research, informed by long-term trials data, DayCent modelling results and stakeholder engagement, suggest there are a few simple changes Kenyan farmers could make that might **improve yields**, while also capturing **more carbon** in the soil.

The fable below illustrates these findings.

Declining harvests

In Kenya's western highlands, **Mzee Jengo** was known far and wide for his bountiful maize harvests, year after year.

One day, a young farmer named **Baraka** came to Mzee Jengo, worry etched on his face.

"Mzee," he said, "I plant maize every season, but my harvests are getting smaller and smaller. My children are hungry, and my heart is heavy. What am I doing wrong?"

This project has received funding from the European Unions' Horizon2020 Grant Agreement No 869367

Learn more

“The Soil is like a Bank”.

Mzee Jengo, seeing the desperation in Baraka’s eyes, decided to share his wisdom.

“You see, Baraka,” he said, “the soil is like a bank. If you take something out, you must put something back. Every time we harvest maize, we take nutrients from the soil. We must return these nutrients, or the soil will become poor.”

Nitrogen and Manure

Mzee Jengo invited Baraka to his farm.

He showed Baraka his compost heap, full of farmyard **manure.** “This is one way to give back to the soil,” he explained.

“The manure is rich in nutrients. But that’s not all. I also add **mineral nitrogen fertilizer**. The combination of manure and fertilizer keeps the soil healthy and the maize happy.”

Learn more

This project has received funding from the European Unions’ Horizon2020 Grant Agreement No 869367

Plants that Protect the Soil

Next, he took Baraka to a field where he had planted **Calliandra** and **Tithonia flowers**.

“These plants help to protect the soil,” he said.

“Their roots go deep, bringing up nutrients from the depths.”

Baraka listened carefully, absorbing every word. He thanked Mzee Jengo for his wisdom and returned to his farm.

Reaping the rewards

Baraka followed Mzee Jengo’s advice.

He added manure and mineral nitrogen fertilizer to his fields, and planted Calliandra and Tithonia flowers.

As his soil became richer, the maize grew taller, and the harvests were bountiful.

Baraka’s heart was no longer heavy. He had learned that caring for the land is also to care for yourself.

This project has received funding from the European Unions’ Horizon2020 Grant Agreement No 869367

Get in Touch!

Stakeholder Engagement

1st Pillar of LANDMARC

LANDMARC

Bottom-up approach

“LANDMARC follows a bottom-up approach, where the knowledge of land users, communities and local experts is used as a baseline for our research. Stakeholder perspectives offer context that a more general analysis may miss.”

The feasibility of Nature-Based Solutions is assessed by:

Local engagement
14 countries in 4 regional platforms

On-the-ground work
in 52 case studies

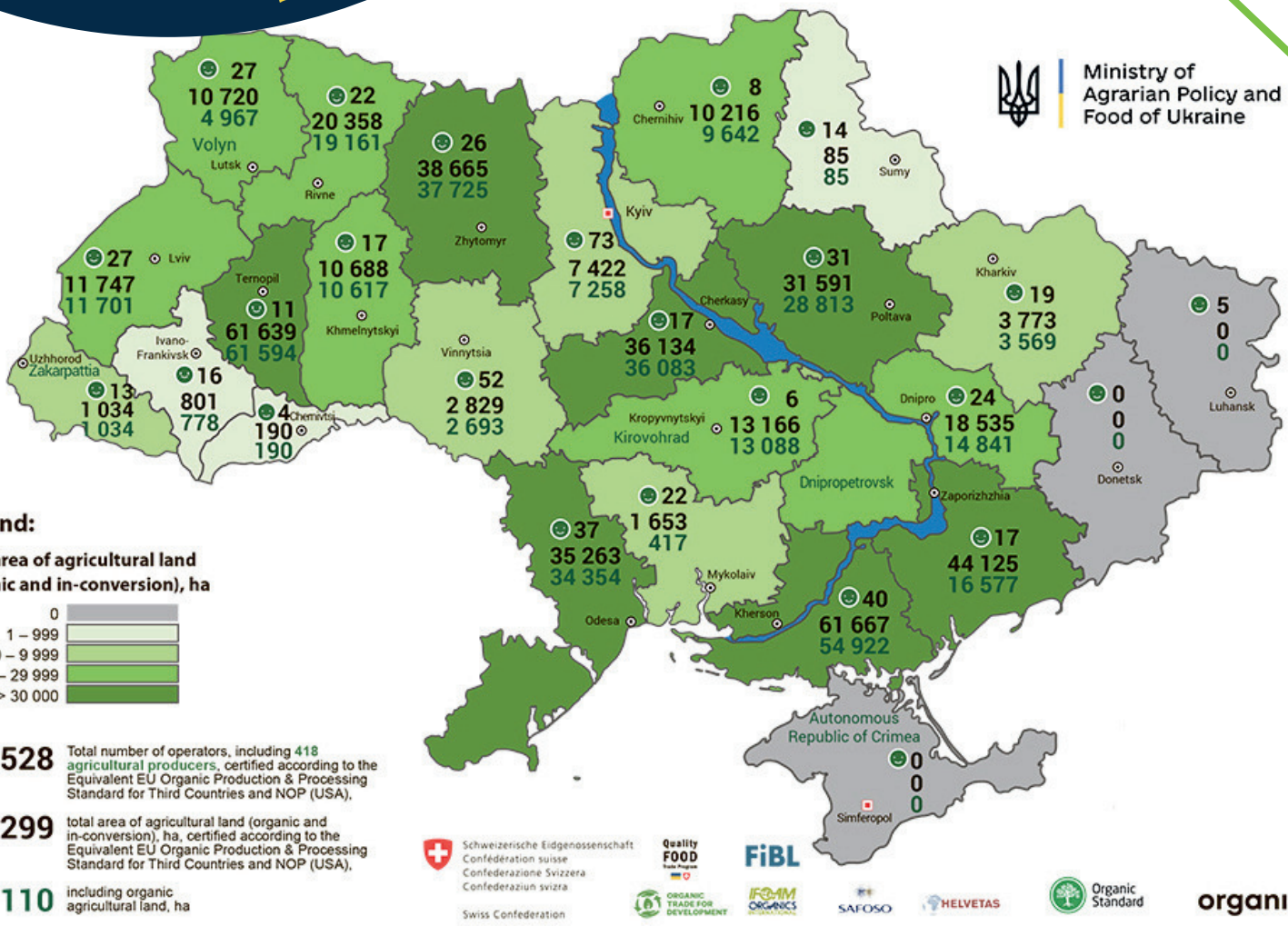
Want to learn more?

Or contact Carlos Picón at carlos@jin.ngo

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Scaling Organic Farming in Ukraine

LANDMARC



Four takeaways

(1) We've been working with a wide range of stakeholders to select LMTs tailor-made for Ukraine's context

(2) Organic Farming is one of the most promising options.

(3) It offers a path to climate goals that doesn't undermine global food security.

(4) Organic Farming also promotes environmental stewardship and agricultural resilience.

Find out more

Email Natalia Prozorova
N.V.Prozorova@tudelft.nl

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Scaling Biogas in Ukraine

LANDMARC

Four takeaways

(1) Biogas addresses two challenges at once: managing organic waste and reducing emissions.

(2) Total biogas production potential in Ukraine is at least 25% of its current natural gas consumption.

(3) We've identified where biogas installation could work best.

(4) More worked is needed to find profitable uses for all by-products of biogas production.

Find out more

Email Natalia Prozorova
N.V.Prozorova@tudelft.nl

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

Searching for Carbon Farming

Meet **Carla**, a dairy farmer from the Netherlands.

As someone who cares deeply both about farming and the climate, Carla dreams of making her farm carbon neutral.

But, the complexity of the certification process and understanding the available incentives feels daunting.

A Maze of (Dis)incentives

As Carla delves deeper into certification requirements, she encounters an intricate maze of policies, guidelines, and verification processes.

Her efforts to implement sustainable practices (like manure management systems and reforesting pasture lands) are met with an array of potential incentives, each with different rules and application processes.

This project has received funding from the European Unions' Horizon2020 Grant Agreement No 869367

Learn more about our research

LANDMARC

How Simplification can Help

Disheartened, Carla attends a local farmers' cooperative meeting.

There she learns about new initiatives to **streamline the certification process** and reduce administrative burdens.

Inspired by the shared experiences of her peers, she realizes her dream is not unattainable after all. She begins to see a path forward.

Transformation in Action

Carla is emboldened by the cooperative's support and freed by the simplified process.

She adopts new technologies for carbon sequestration and engages in innovative practices like **agroforestry**, all the while documenting her journey for the simplified certification process.

The once daunting maze of policies now feels like a guided path towards sustainability.

Learn more about our research

This project has received funding from the European Unions' Horizon2020 Grant Agreement No 869367

A Sustainable Legacy

Years later, Carla's farm becomes a model of carbon-neutral dairy farming in the Netherlands.

Her efforts not only contribute to the fight against climate change but also inspire a new generation of farmers.

The **simplification of the certification process and incentives landscape** has empowered many more farmers like Carla to take bold steps toward sustainability.

Find out more

Curious about about **how** the carbon farming certification process and incentives landscape could be made simpler for farmers like Carla?

We've written a **detailed article** about this which is in the process of being published.

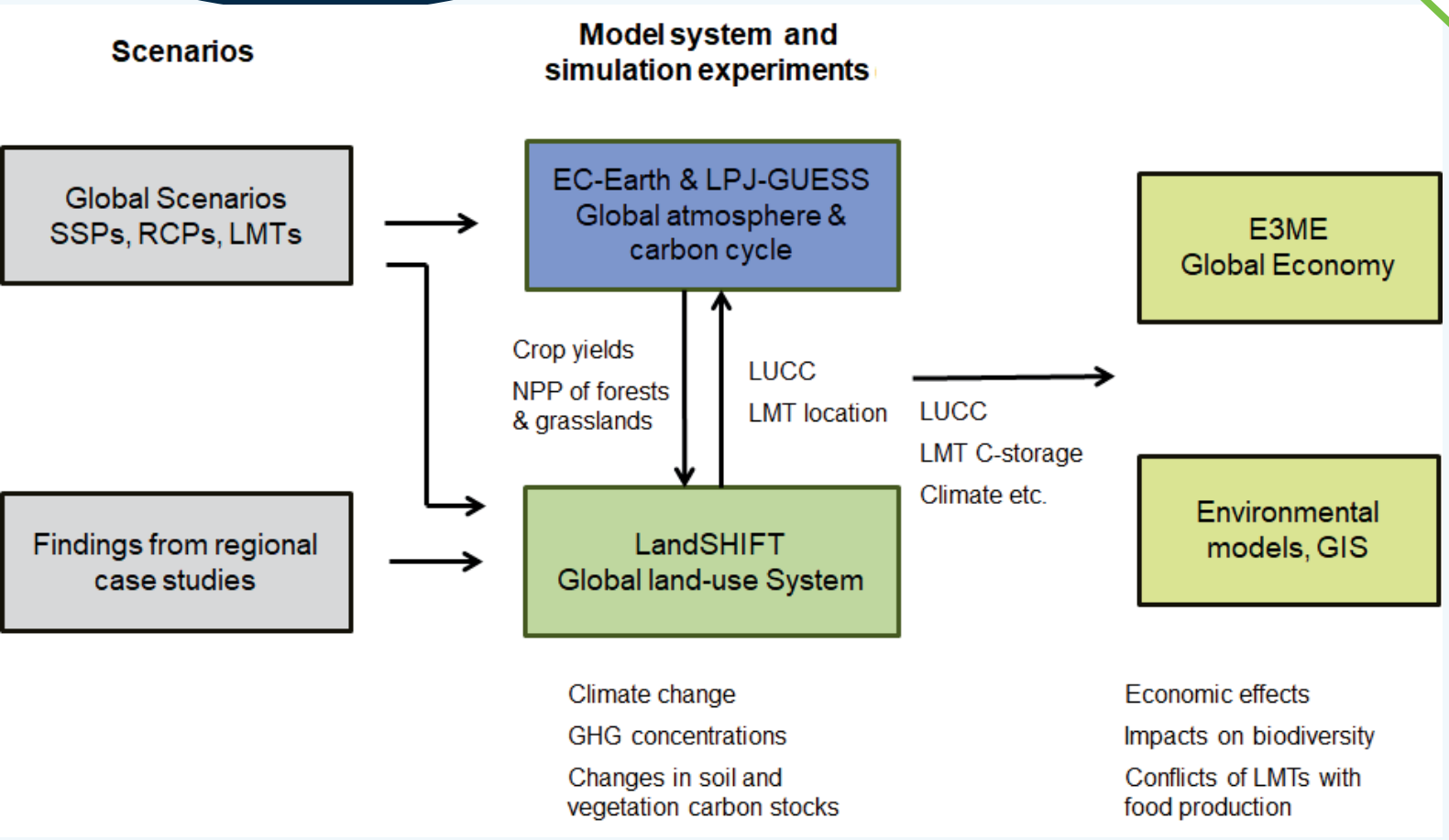
If you'd like to know more in the meantime, please contact **Eise Spijker** at **Eise@jin.ngo** for more information.

This project has received funding from the European Unions' Horizon2020 Grant Agreement No 869367

Email Eise

Global Modelling of Land-Based Mitigation Technologies

LANDMARC



What we are doing: We're scaling up findings from local & regional case studies with a land-use model (LANDSHIFT-G) and a global climate model (EC-Earth).

Why we're doing this: It allows us to model interactions between climate, vegetation and land use.

What we've found: Preliminary results show that land-based mitigation technologies (LMTs) need to be part of the solution to the climate crisis, as well as strong emission reductions.

Results coming soon!

Email Etienne Tourigny or Florian Wimmer
etienne.tourigny@bsc.es / wimmer@usf.uni-kassel

This project has received funding from the European Union's Horizon2020 Grant Agreement No. 869367

DEHESAS & MONTADOS

AGROSILVOPASTORAL SYSTEMS IN SPAIN AND PORTUGAL

Dehesas and Montados are traditional land use systems in Spain and Portugal that combine forestry with cork oaks and grasslands with low intensity farming of pigs, sheep an cows.

The LANDMARC project studied the effects on the environment of these complex system, and the climate risks they are exposed to.

CLIMATE RISK

DROUGHTS

Dehesas are well adapted to heatwaves and droughts during the summer. However, the increasingly unpredictable distribution of rains and heat extremes outside the summer season compromise the system by altering biological cycles and triggering erosion.

WILDFIRES

The combination of weather extremes, decreased system health and land abandonment due to rural depopulation makes the system vulnerable to wildfires.

PESTS

Compromised system health combined with the effects of climate change results in the increased proliferation of pathogens that seriously threat this ecosystem, such as "La Seca”

EFFECTS ON THE ENVIRONMENT

BIODIVERSITY

The combination of trees, grasses and different types of grazing animals allows for a very fast nutrient cycle, resulting in high biodiveristy and system resilience.

SOIL HEALTH

The shade provided by trees and the year-round soil coverage translates into reduced erosion and high water retention, even in hot and dry environments.

CARBON SEQUESTRATION

The fast biological cycles of the system results in a high ecosystem carbon, enhanced by the exploitation of forest products such as cork.

Learn more!

or email Carlos Picón at carlos@jin.ngo

OUTLINE

The dehesa/montado model is an example of a technique combining climate adaptation, mitigation and economic exploitation by creating a closed ecological cycles that respect the ecosystem.

LANDMARC

This project has received funding from the European Unions' Horizon2020 Grant Agreement No 869367

DEHESAS Y MONTADOS

SISTEMAS AGROSILVOPASTORALES EN ESPAÑA Y PORTUGAL

Las dehesas y los montados son sistemas agrarios tradicionales en España y Portugal que combinan explotación forestal de encinas y alcornoques, pastos y ganadería de baja intensidad de cerdos, ovejas y vacuno.

El proyecto LANDMARC estudia los efectos ambientales de este complejo sistema, así como los riesgos ambientales a los que se enfrenta.

RIESGOS CLIMÁTICOS

SEQUÍAS

Las dehesas están bien adaptadas a sequías y olas de calor en el periodo estival. Sin embargo, la cada vez más impredecible distribución de las lluvias y las olas de calor fuera del verano comprometen el sistema, alterando sus ciclos biológicos.

INCENDIOS

La combinación de fenómenos climáticos extremos, una menor salud del ecosistema y el abandono de tierras por la despoblación rural hacen a las dehesas cada vez más vulnerables a incendios forestales.

PLAGAS

La disminución de la salud del ecosistema, en combinación con los efectos del cambio climático, permiten que plagas como “la seca” proliferen con una mayor facilidad.

EFECTOS MEDIOAMBIENTALES

BIODIVERSIDAD

La combinacion de árboles, pastos y diferentes tipos de ganado se traduce en un ciclo de nutrientes muy rápido y abundante, promoviendo una gran biodiversidad y resiliencia.

SALUD DEL SUELO

La sombra de los árboles y la cobertura del terreno durante todo el año evitan la erosión y permiten que este mantenga una mayor humedad, incluso en periodos secos y calurosos.

SECUESTRO DE CARBONO

Estos rápidos ciclos biológicos se derivan en una mayor acumulación en carbono en el ecosistema, intensificado por el aprovechamiento de corcho y otros productos forestales.

EN RESUMEN

El modelo de dehesas y montados es un buen ejemplo de explotación agraria que combina resiliencia climática, mitigación y beneficio económico creando sistemas ecológicos sostenibles y beneficiosos para el medio.

Learn more!

or email Carlos Picón at carlos@jin.ngo

LANDMARC

This project has received funding from the European Unions’ Horizon2020 Grant Agreement No 869367

Netherlands

Peatland Rewetting

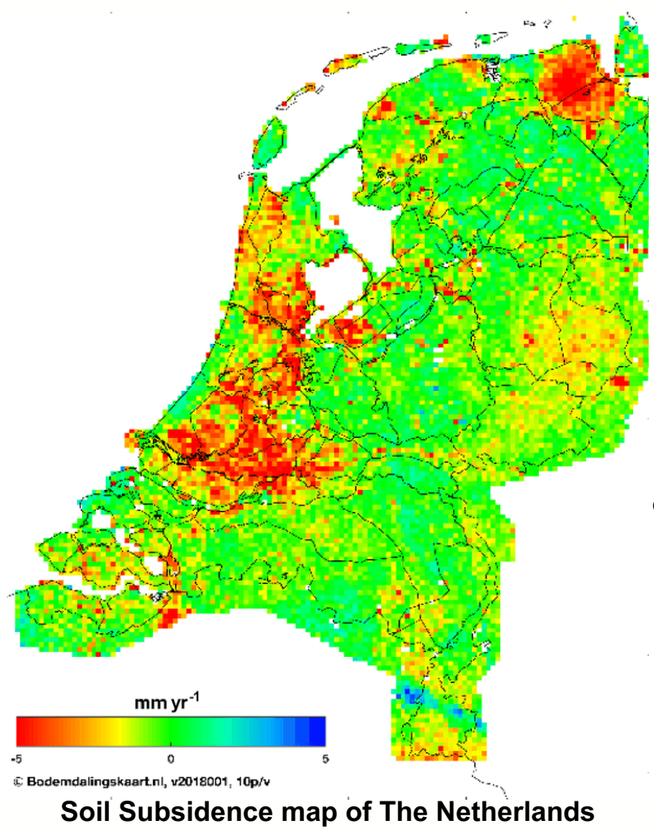
Draining peatlands

In parts of the Netherlands, people have been lowering ground-water levels for centuries.

Among other things, this makes wetlands available for other uses, increases agricultural yields, and, in the past, allowed for the utilization of peat.

But lowering ground-water levels in areas with organic soils has far-reaching effects.

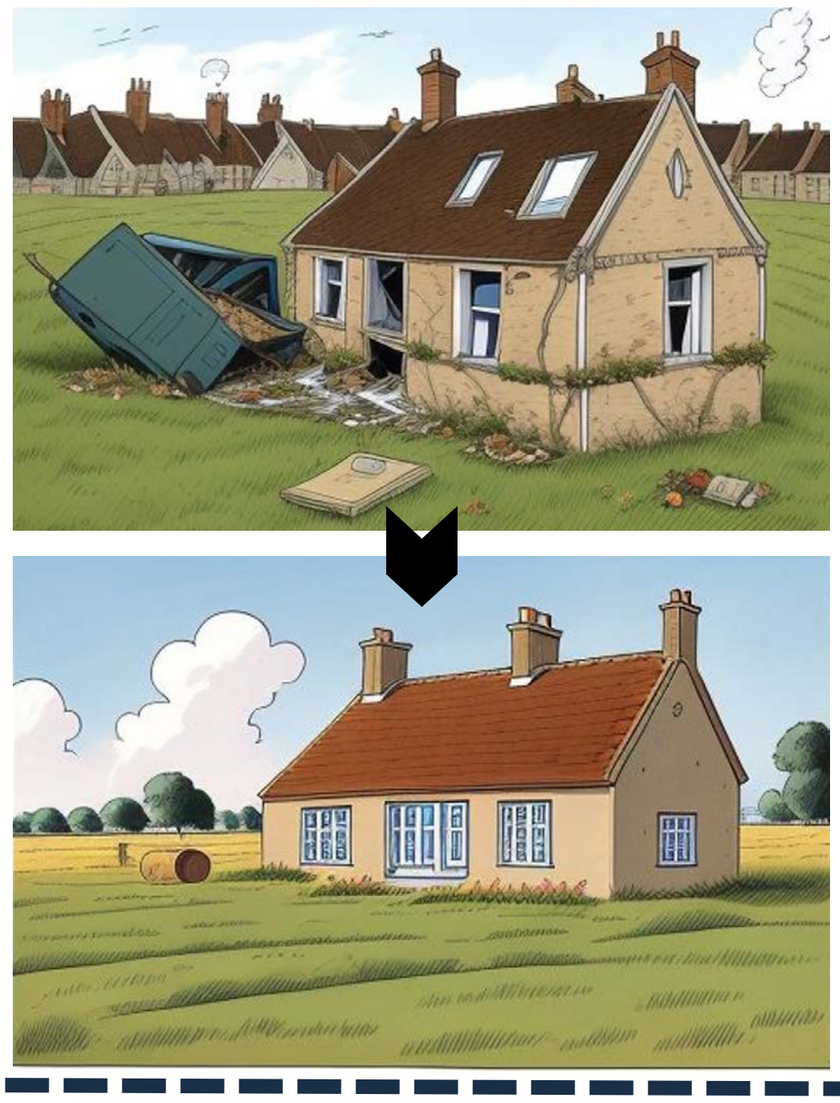
Effects



Soil Subsidence map of The Netherlands (© Bodemdalingskaart.nl)

Consequences include:

- **GHG emissions.** Peatlands contain >20% of the world's soil carbon. Draining peatlands releases that carbon into the atomsophere.
- **Infrastructure damage.** Lowering groundwater levels can cause soil subsidence, which can damage houses, roads and railways systems.



Raising Water Levels

The good news is that, by raising water levels, much of this damage can be reversed, reducing emissions and damage.

But, as our research found, this would likely result in some agricultural land becoming less productive.

Farmers could adapt by switching to water tolerant crops (known as paludiculture) or lowering the demand for dairy cattle grazing fields.

What this means

Peatland rewetting is a way to **unify climate change mitigation and ecosystem services** while addressing social issues.

But it also goes **against traditional practices** and implies deep **changes** in the productive systems of the affected regions.

Learn more!

Email Carlos Picón at carlos@jin.ngo

This project has received funding from the European Unions' Horizon2020 Grant Agreement No 869367

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Nature-based Solutions - Beyond Carbon Sequestration

Introduction

As climate researchers, we often focus on the mitigation potential of NBSs, but which other effects on the environment do they have?

LANDMARC conducted 81 interviews with land users and experts in 14 countries in Europe, Africa, America and Asia. The findings could change our understanding of NBSs.

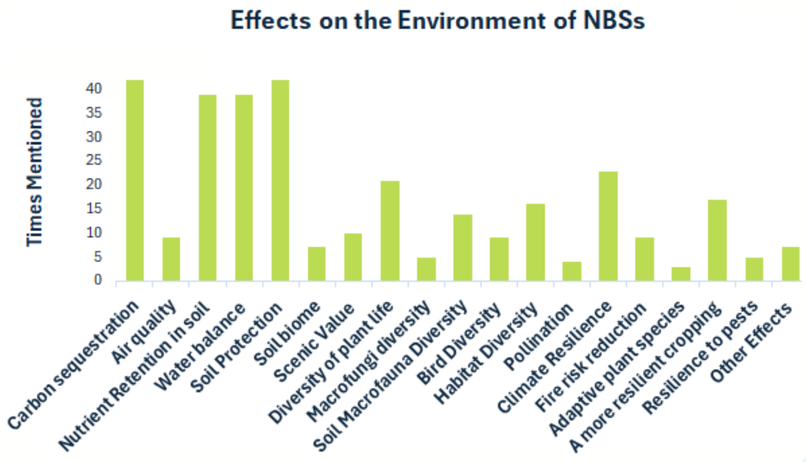
Mitigation / Adaptation

When asked to evaluate the effects of the implementation of NBSs, most interviewees cited increased ecosystem carbon as one of them, but parameters linked to resilience and climate adaptation prevailed in most cases.

This is especially true for developing countries, which are often more exposed to the effects of climate change and where food security is often a bigger concern.

Why?

Compared to widespread land management practices (such as some industrial agriculture techniques), most NBSs increase the resilience of the system by improving soil quality, avoiding erosion and restoring biological cycles. This makes the systems more resilient to the effects of climate change change.



Implications

While in most cases the adaptation benefits of NBSs outweigh their mitigation potential, their upfront cost and long-term returns often hamper their implementation. However, it is easier to capitalize on the mitigation component in the form of carbon credits in the shorter term. This could be understood as a useful enabling mechanism for implementing these techniques, addressing both mitigation and adaptation, and bridging the gap between land users and the sustainabilty community interests.

Want to learn more?

Web article

Deliverable

Or contact Carlos Picón at carlos@jin.ngo