

# SMARTAGRO

## SUSTAINABLE INNOVATIONS

increased profits \* enhanced resilience \* reduced emissions

4p1000  
4. October 2021

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



6 CLEAN WATER AND SANITATION



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



15 LIFE ON LAND



16 PEACE AND JUSTICE STRONG INSTITUTIONS



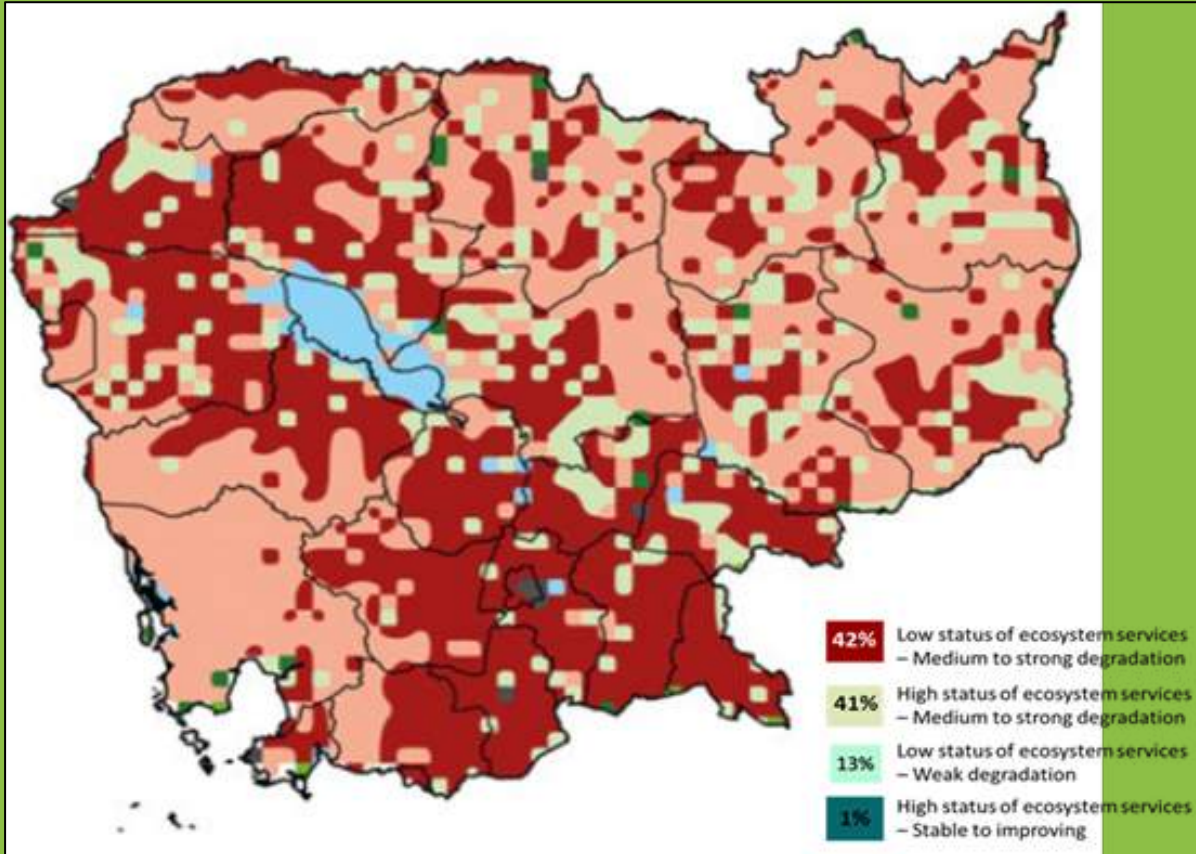


## Mission

SmartAgro implements agroecological practices to add long term value to people, smallholder communities and the ecosystem in the farming industry, and reward regenerative practices for a transition to a nature-positive agriculture.

# Cambodian context

## The Problem: Agricultural land degradation



Land Degradation Source: GLADIS-FAO16

- 79% of Cambodians live in rural area.
- 42% of **agricultural land** is medium to severely **degraded (C depleted)**

### **AFOLU** accounts for:

- 24% of GHG emissions globally,
- 44% in Asia,
- 85% in Cambodia.

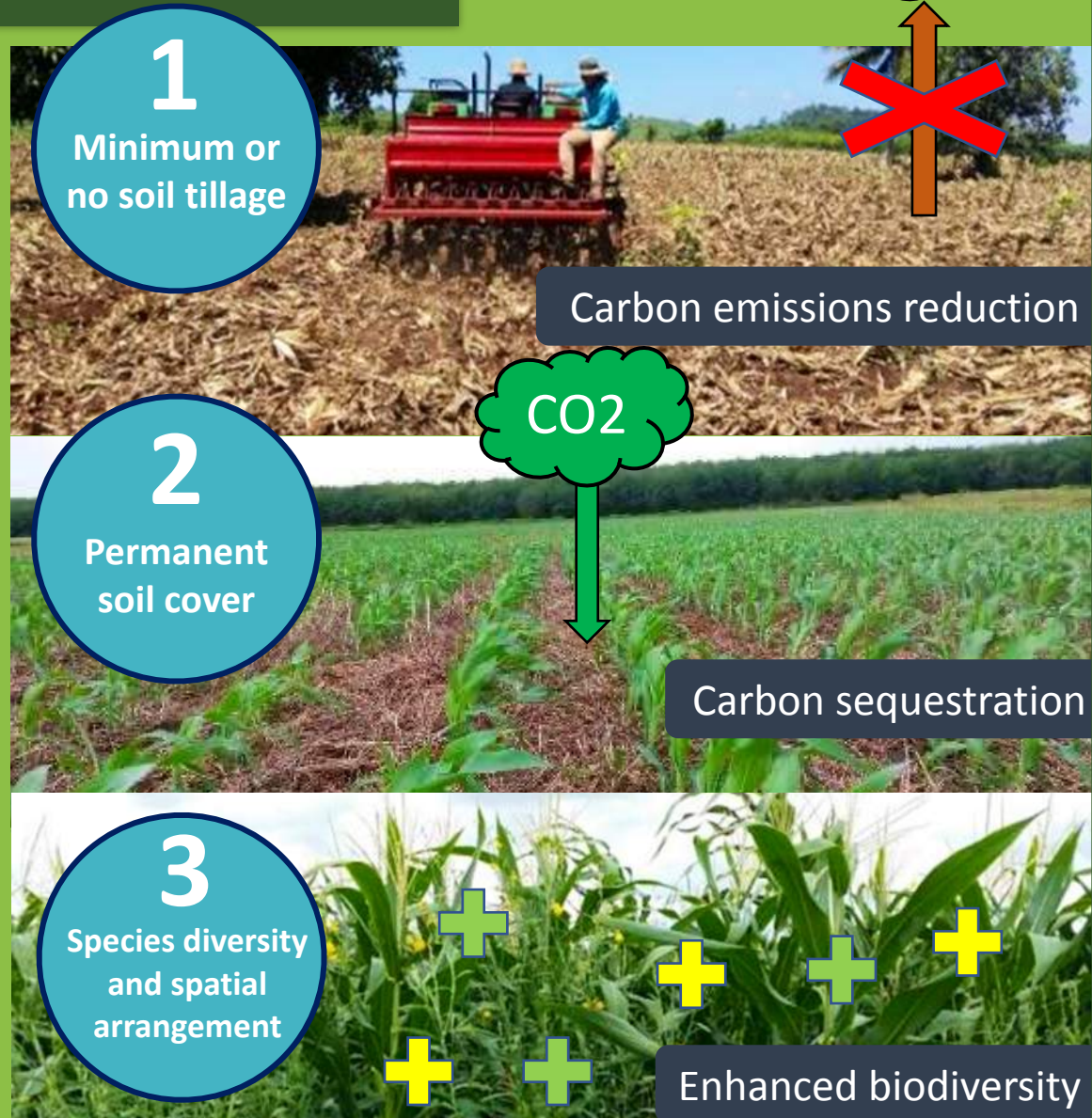
**Annual cost of land degradation** is \$677 million or 8% of GDP in 2010. (UNCCD, 2018)

# The Solution: Conservation Agriculture

## Impacts and co-benefits

### Co-benefits:

- Climate Change mitigation & adaptation
- Soil improvement (reduced erosion, increased fertility and water retention)
- Increased profits, enhanced resilience, reduced emissions
- Increased biodiversity and natural resource conservation





## Smart Agro at a glance

Backed-up by R&D work in Conservation Agriculture conducted by the General Directorate of Agriculture (GDA/DALRM) and CIRAD over the last 15 years

- Technical Assistance to scale-up Sustainable Intensification & CA
- Supplier of cover crops produced with farmer networks
- Supplier of high quality Bio pesticides and Bio feed additives

Bananas, papayas,  
panicum, designed  
& implemented  
by Hoa Tran Quoc

# The Solution: no-till + cover crops



Biomass input + good  
weed control

Reduced costs for

- labor
- fertilizer
- pesticide
- herbicide
- gasoline
- machinery





**Our designs achieve a triple win:**

- increased production/ profits
- enhanced resilience
- reduced emissions

**We increase resources in the soil instead of extracting them:**

- Increase in soil C (+300–500 kg C/ha/year)
- N (+45 kg N/ha/year), better plant nutrition
- 2X Water infiltration rate (264 ml/min)
- Improved soil structure + aggregation
- 2X soil respiration microbial communities

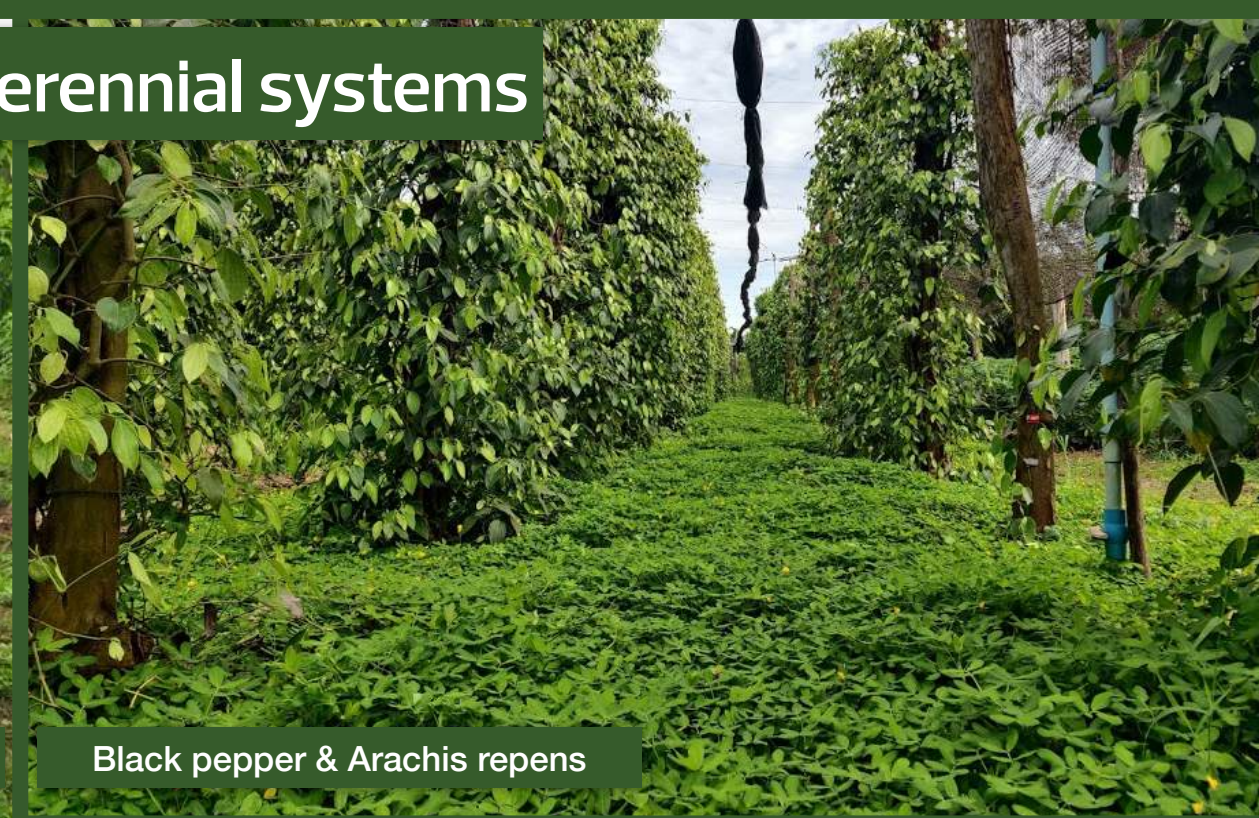
Maize on biopump seedmix.  
No weeds.



# Climate-smart perennial systems



Mango & sunn hemp



Black pepper & Arachis repens

- Soil protected
- N supply
- Integrated pest management
- Integrated soil fertility management



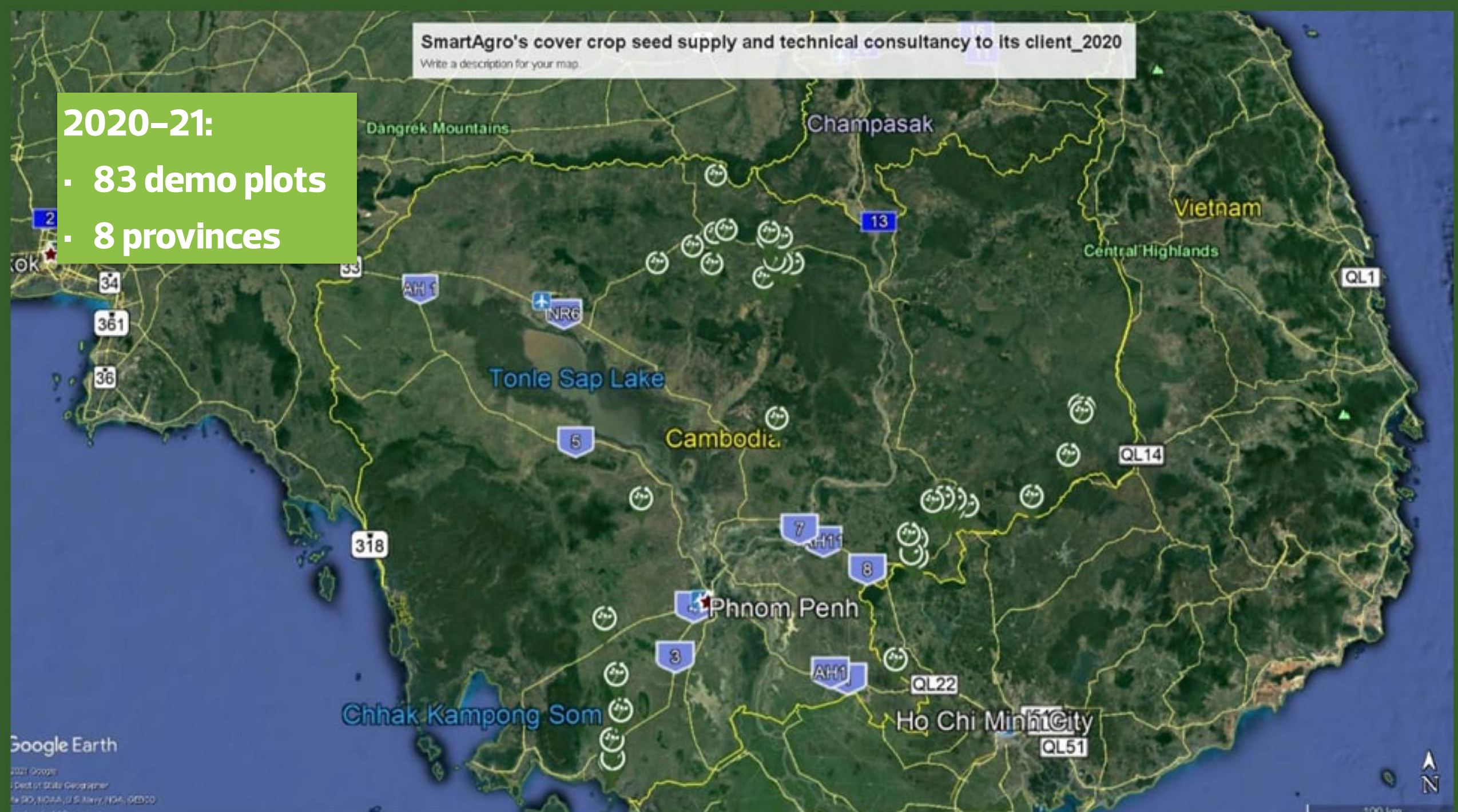
Rubber & stylosanthes guianensis

SmartAgro's cover crop seed supply and technical consultancy to its client\_2020

Write a description for your map.

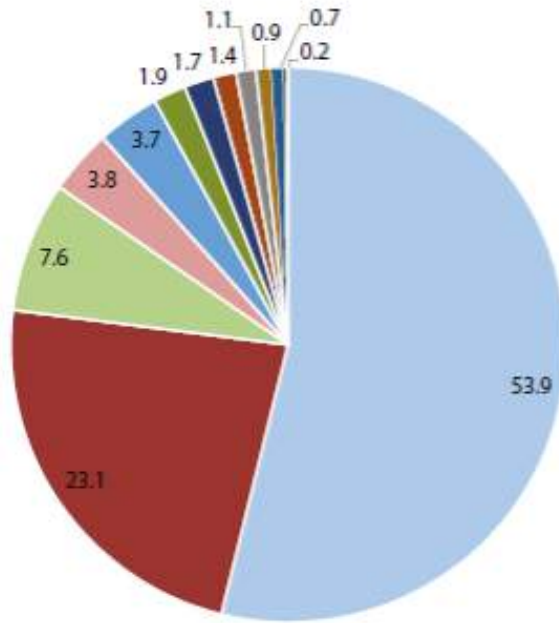
2020-21:

- 83 demo plots
- 8 provinces



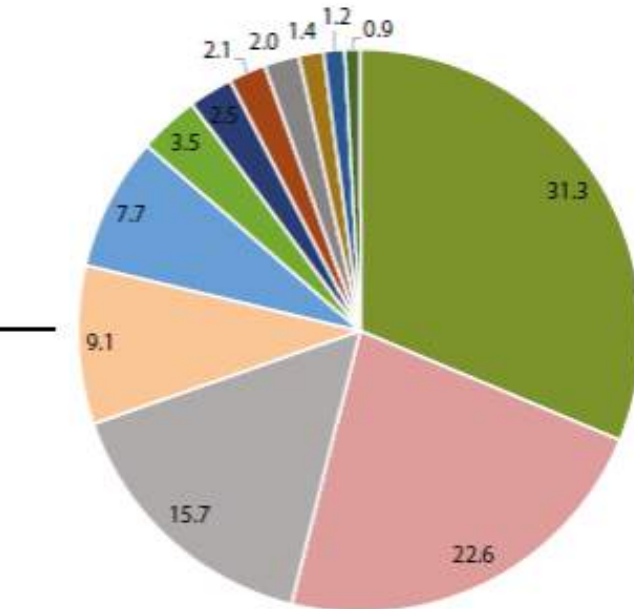
# Commoditization of farming systems

Share of area under annual crops (non-rice)

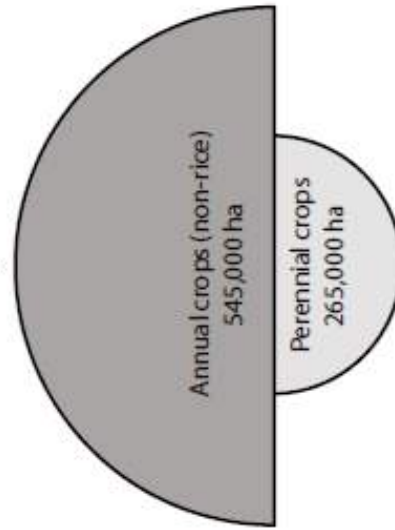


**Cassava  
Maize**

Share of area under perennial crops



**Rubber  
Cashew  
Fruit tree  
Banana**



Nationwide > 600,000 ha of cassava

Ingalls *et al.*, 2018. State of Land in the Mekong Region

# DEI MEAS (GOLDEN SOIL): Payment System for Ecosystem Services

- Enabling support for smallholders from donors/buyers via a transparent, inexpensive MRV system
- Providing incentives for adoption of regenerative practices via transparent reward system



part of ASSET project

A composite illustration representing the MRV+R system. It shows a satellite in space with beams of light scanning a field. A tractor is working in the field, and a person is using a handheld device in the foreground. The scene is set against a sunset sky.

MRV+R

# Project developer / Aggregator

National and international  
research institutions



International NGO  
→ Business model, project  
management



Private Company  
→ TA and intl market  
access



# Partners – Dei Meas Pilot

Field team/ Government



Farmer Aggregator

**WAT4CAM**

Cooperatives

Donor/NGO

Processors

Registry



Third-party Verifier

*tba*

Remote-sensing and MRV



# Political framework & PPP

Enabling environment to promote rewards for provision of ecosystem services



Government

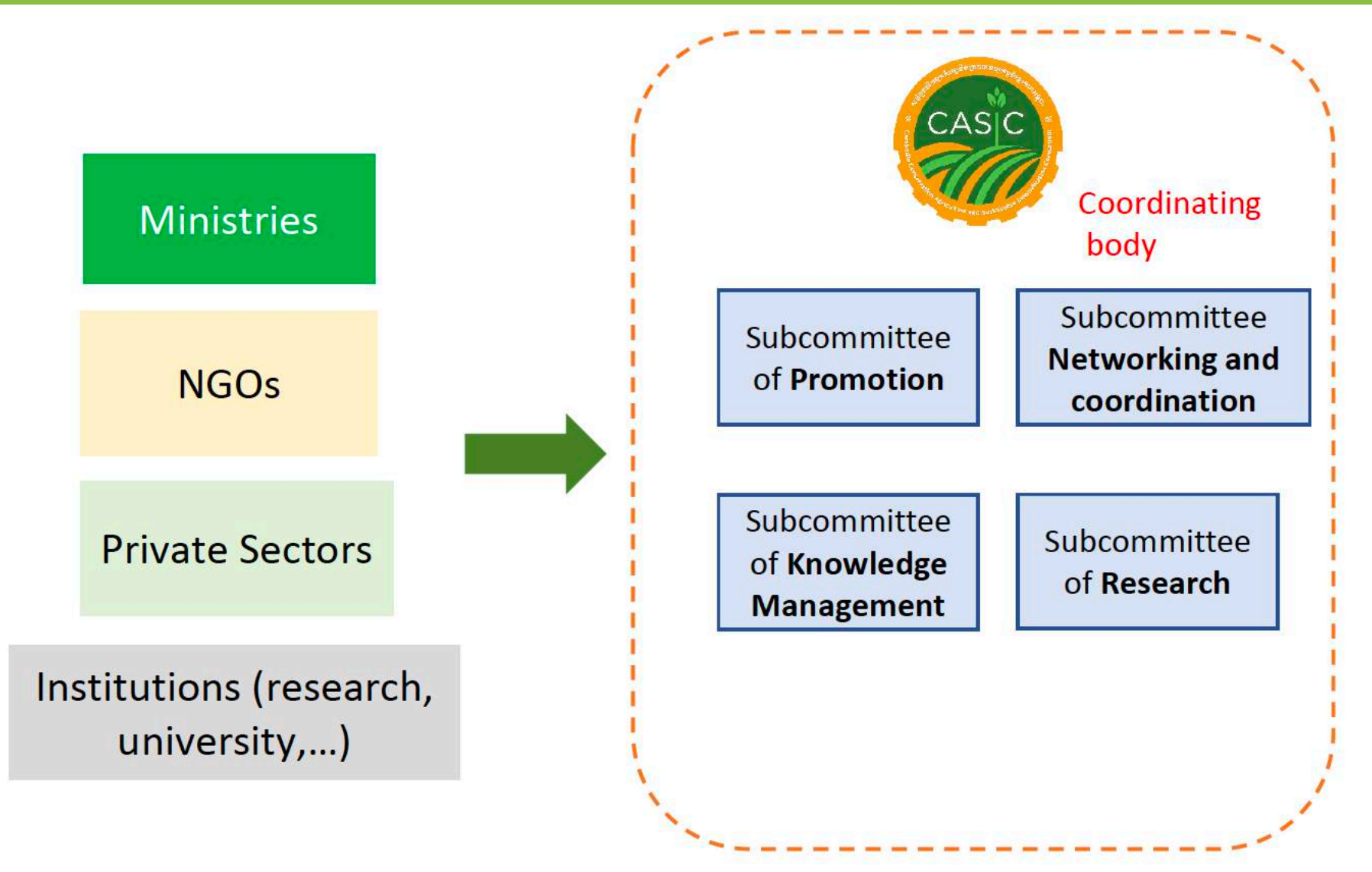


Ministry of Ag



- effective governance
- public policies
- institutional arrangements
- financial mechanisms
- incentives and regulatory instruments
- land tenure rights protection
- education and capacity building

# Transition to Agroecology & CA/SI





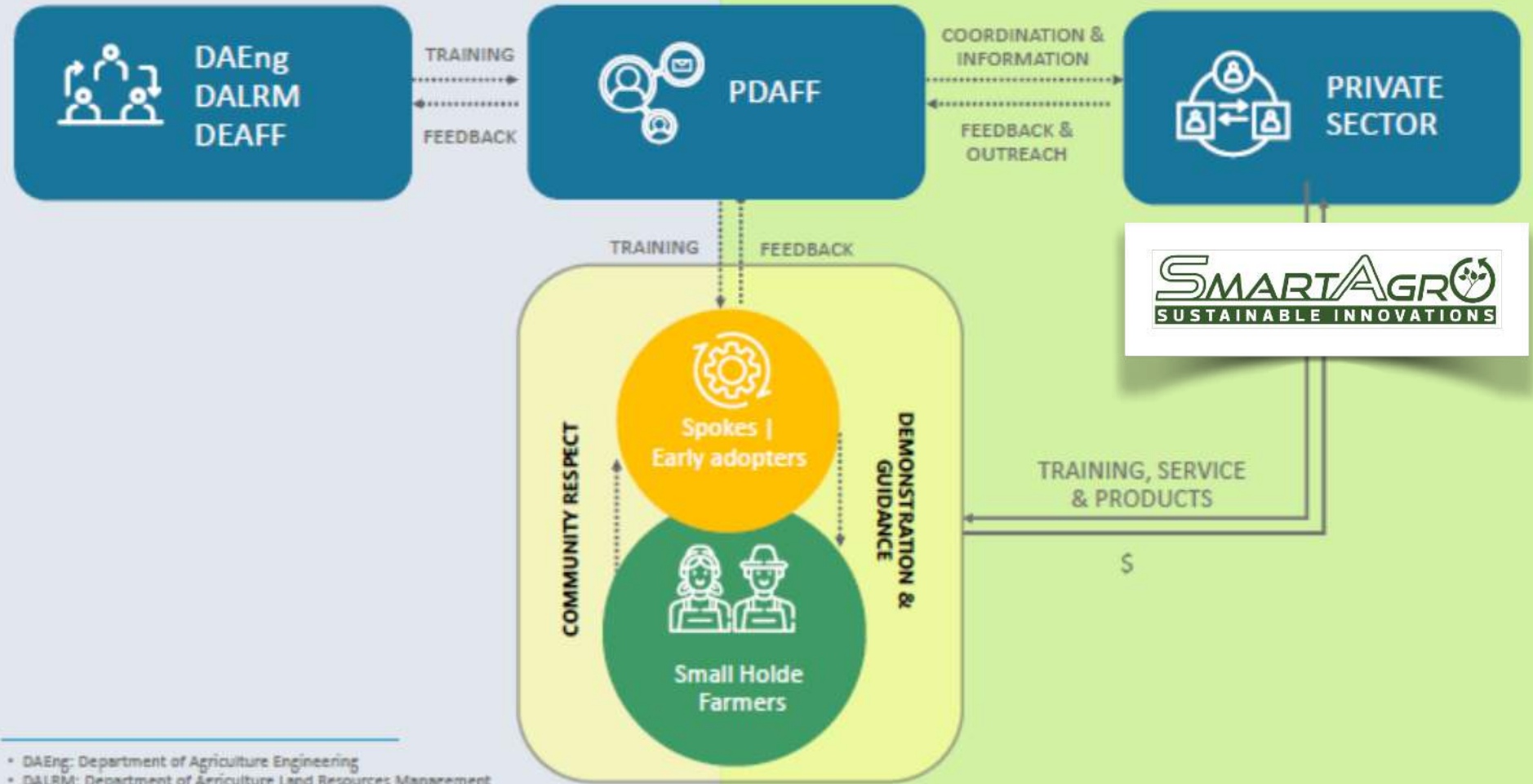
# Implementation & scaling

## Early adopters-led extension model



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Metkasekor  
(Farmer's Friend)

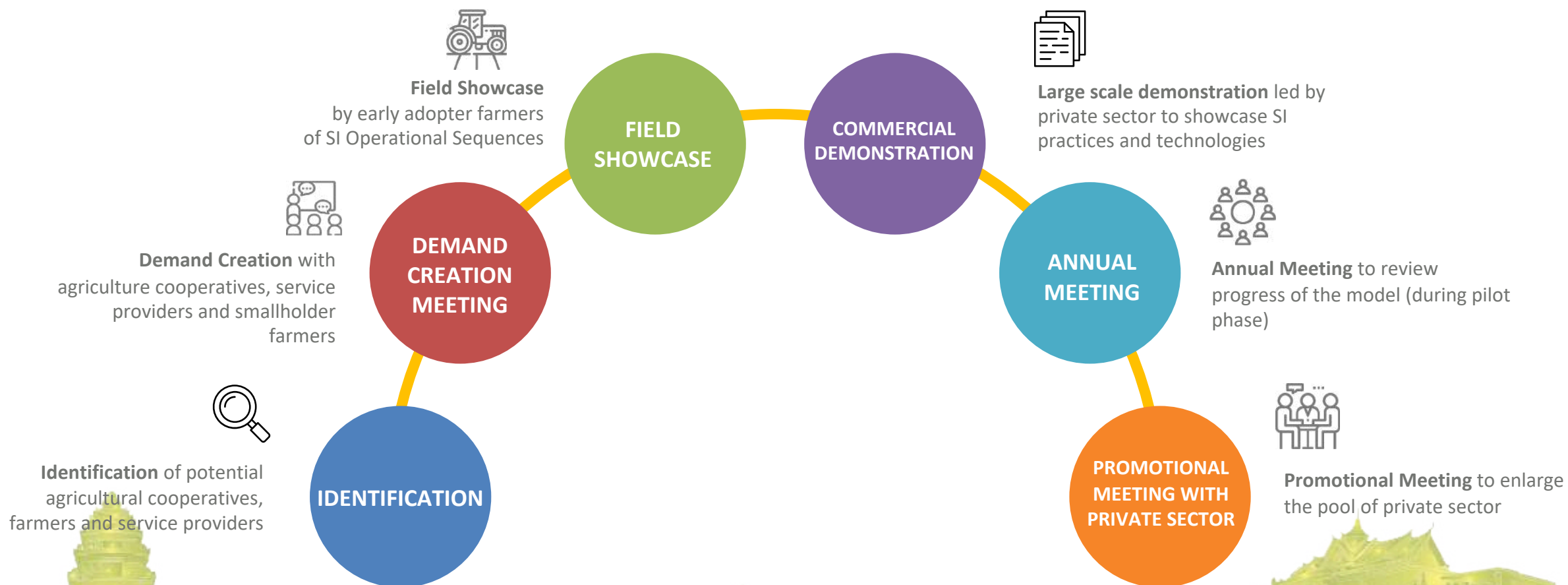


- DAEng: Department of Agriculture Engineering
- DALRM: Department of Agriculture Land Resources Management
- DEAFF: Department of Extension of Agriculture, Forestry and Fisheries
- PDAFF: Provincial Department Agriculture, Forestry, and Fisheries

# Implementation & scaling

## Early adopters-led extension model

### Metkasekor Steps



# Implementation & scaling

Early adopters-led extension model

Metkasekor Technology



soil cultivator

1 preparing land for plantation

2 land levelling



land leveller



combine harvester

6 harvesting main crop

3 planting of cover crop



seed broadcaster



no-till planter

5 planting of main crop

4 cover crop management

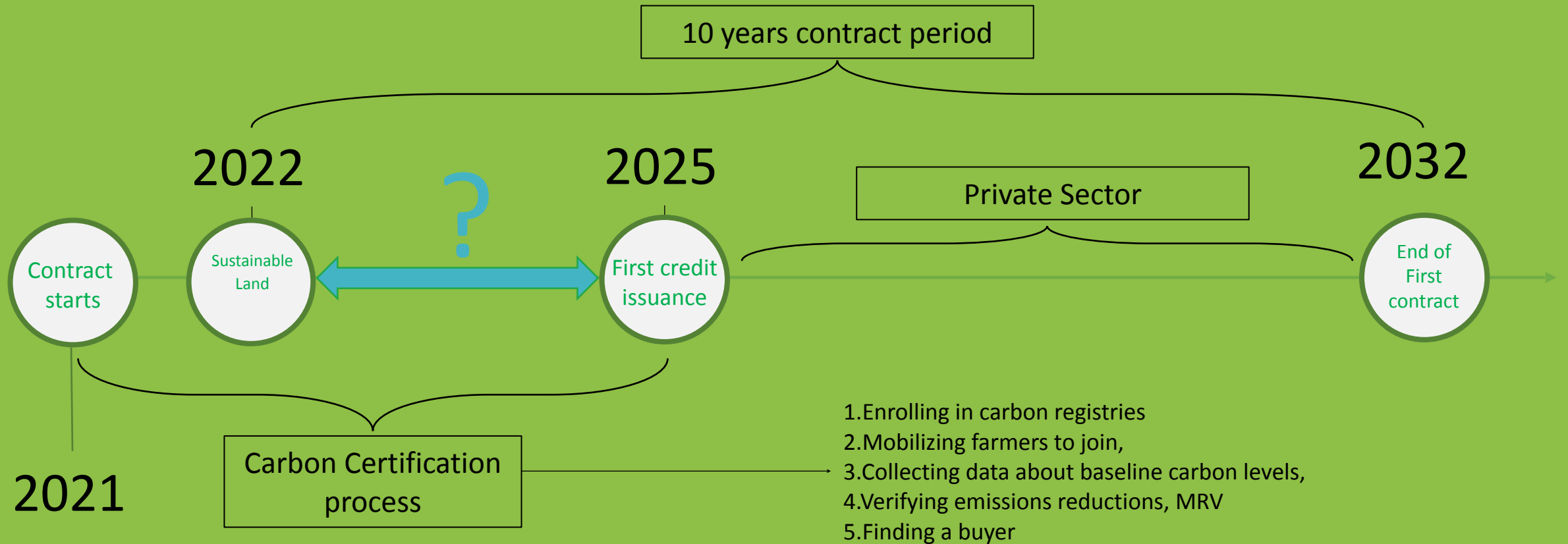


roller crimper



# The voluntary carbon market

## Timeline



## Towards a croplands methodology for tropical climates

### PhD thesis past and present

- Assessing & mapping soil organic carbon (SOC) sequestration potential: PhD Lyda Hok (2015, 2018, 2020), Msc Vira Leng (2014 + re-sampling 2018)
- Assessing SOC dynamic (stabilization vs. mineralization, Biofunctool; Pheap, Lefèvre et al., 2019)
- Assessing the impacts of land use on SOC, regional study Laos – Cambodia (Battambang, ASSET/FFEM)
- Assessing trade-offs between SOC sequestration and other GHG emissions (PhD Vira Leng, 2021 – 2024, ASSET/FFEM, Kampong Cham, Red Oxisol)
- Evaluating the effects of SOC on yields and ecosystem goods and services (PhD Sambo Pheap, 2021 – 2024, CCCA, Battambang)
- IR Spectroscopy to be developed (VIE, Titouan Filloux, 2021 – 2022)
- On-going work of the Global Soil Partnership updating SOC stocks at national scale with potential comparison of land uses

# The Solution

Remote sensing



# Our Approach

We are building a platform that will reduce the monitoring, reporting, and verification costs of nature-based climate solutions by 10x and increase transparency in the markets.



## What we measure

We use remotely sensed data to quantify the impact of regenerative agriculture practices in a low-cost way. Our current focus is on Soil Organic Carbon (SOC) where we have reached regional **accuracies of 80%**.



## The Solution

Our insights are serviced to our customers through our web portal, **seqana.earth**. These are downloadable in a variety of formats.



## Data

Our solution uses a blend of Copernicus, LandSat, and commercial data sources with various spectral signatures and resolutions. Our SAR based approach was **featured in the Copernicus Masters**.



## Impact

Our mission is to **enable nature-based climate solutions** and to democratize the carbon markets by lowering the complexity and cost to of entry for small-holder farmers around the world.

# CREDIT CLASSES



NO-TILLAGE (NT) + CROP  
DIVERSIFICATION



$x$  \$/ ?

(per year no tilled, no of  
species per crop sequence)



NT + CROP DIVERSIFICATION +  
SINGLE COVER CROPS



$x$  \$/ ?

(Linked  
to biomass produced)



NT + CROP DIVERSIFICATION +  
MIXED COVER CROPS



$x$  \$/ ?

(Linked to no of species per  
season)



ALTERNATE WETTING AND DRYING  
(AWD)



$x$  \$/ ?

(Linked to draining field for  
 $x$  days)



## PROJECT AT A GLANCE



6.000ha  
OF EARLY ADOPTERS



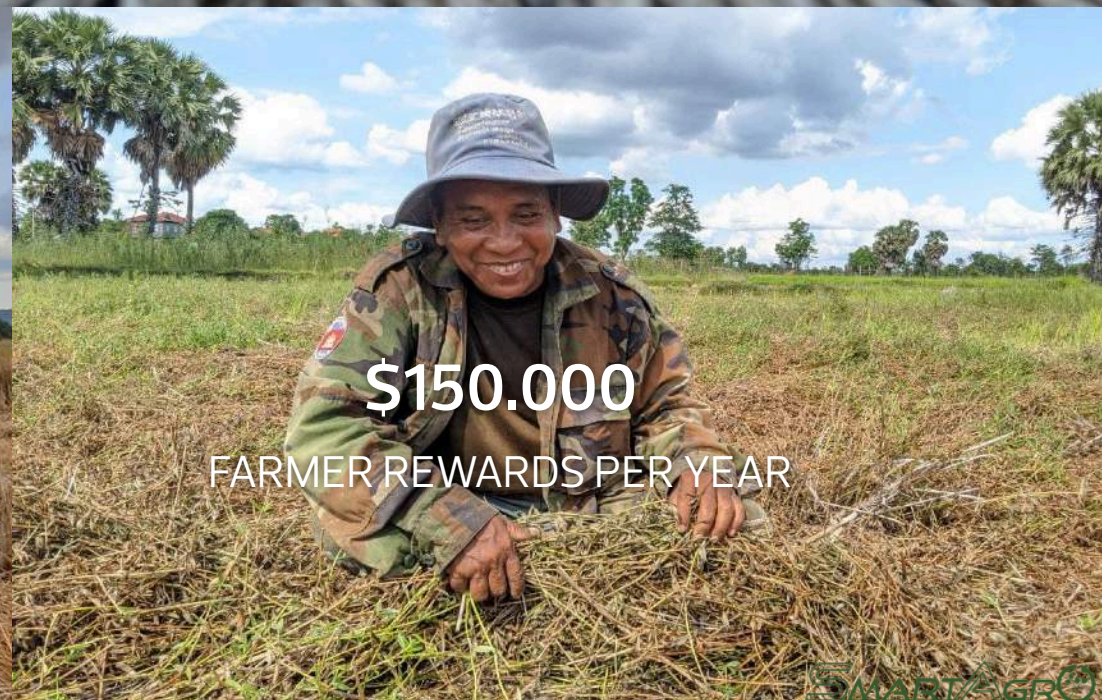
3 PRACTICES

COVER CROPS, NO-TILL,  
DIVERSIFIED ROTATIONS

3  
YEARS



2.000 FARMER  
HOUSEHOLDS



\$150.000  
FARMER REWARDS PER YEAR

## PROJECT OUTCOMES

**INCREASED PROFITS FOR FARMERS &  
BETTER QUALITY OF FOOD PRODUCTS**

THROUGH IMPROVED SOIL & ECOSYSTEM HEALTH &  
ENHANCED RESILIENCE

**EST. 10.000 +**

METRIC TONNES OF CO<sub>2</sub>-E  
STORED IN SOILS **PER YEAR**

**FARMER CENTRIC  
RESEARCH**

DRIVEN BY PhD STUDIES

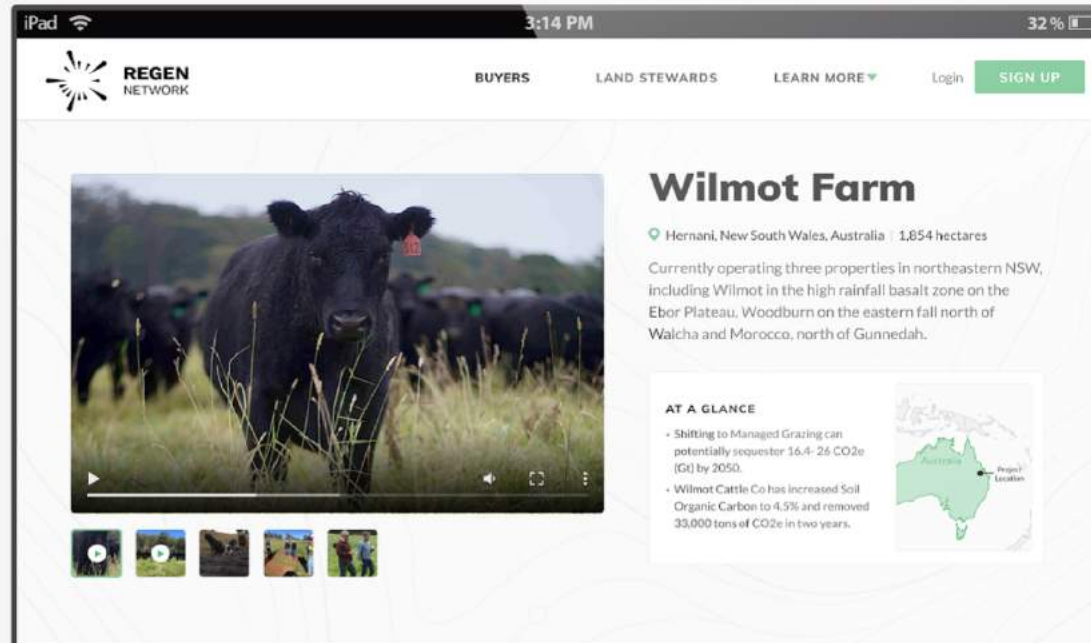
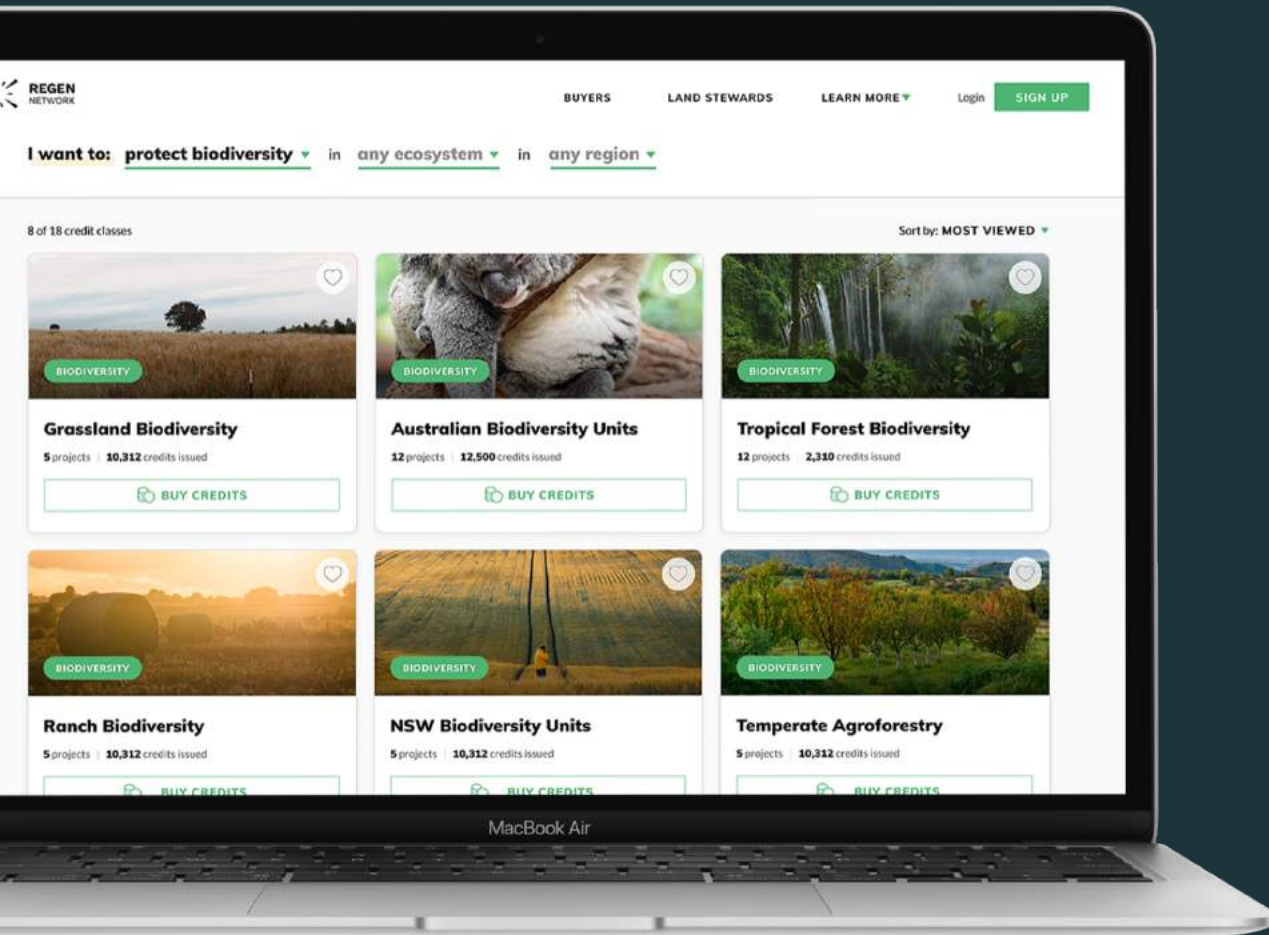
**GETTING TO SCALE**

BY LINKING FARMERS TO NEW  
ECOSYSTEM PAYMENT SCHEMES

**BUILDING THE MARKET**

CREATING DEMAND & SUPPLY FOR  
ALL STAKEHOLDERS

# Regen Registry



## Story

Wilmot is an extraordinary property high in the New England Tablelands at Ebor. Set on 1,854ha and at approximately 1,200m above sea level, average annual rainfall of 1,200mm, highly fertile volcanic basalt soils, and complimented by a series of pristine spring fed, year-round natural waterways including five waterfalls, it is quite simply a unique environment for growing cattle.

[READ MORE](#)

### PROJECT DEVELOPER

#### Impact Ag

Armidale, New South Wales, Australia

Impact Ag utilises a variety of pathways and partners to measure and monetise natural capital on assets under management or advisory.

### LAND STEWARD

#### Wilmot Cattle Co.

New South Wales, Australia

Wilmot Cattle Company is an innovative, regenerative, grass-fed beef business.

## Monitored Impact

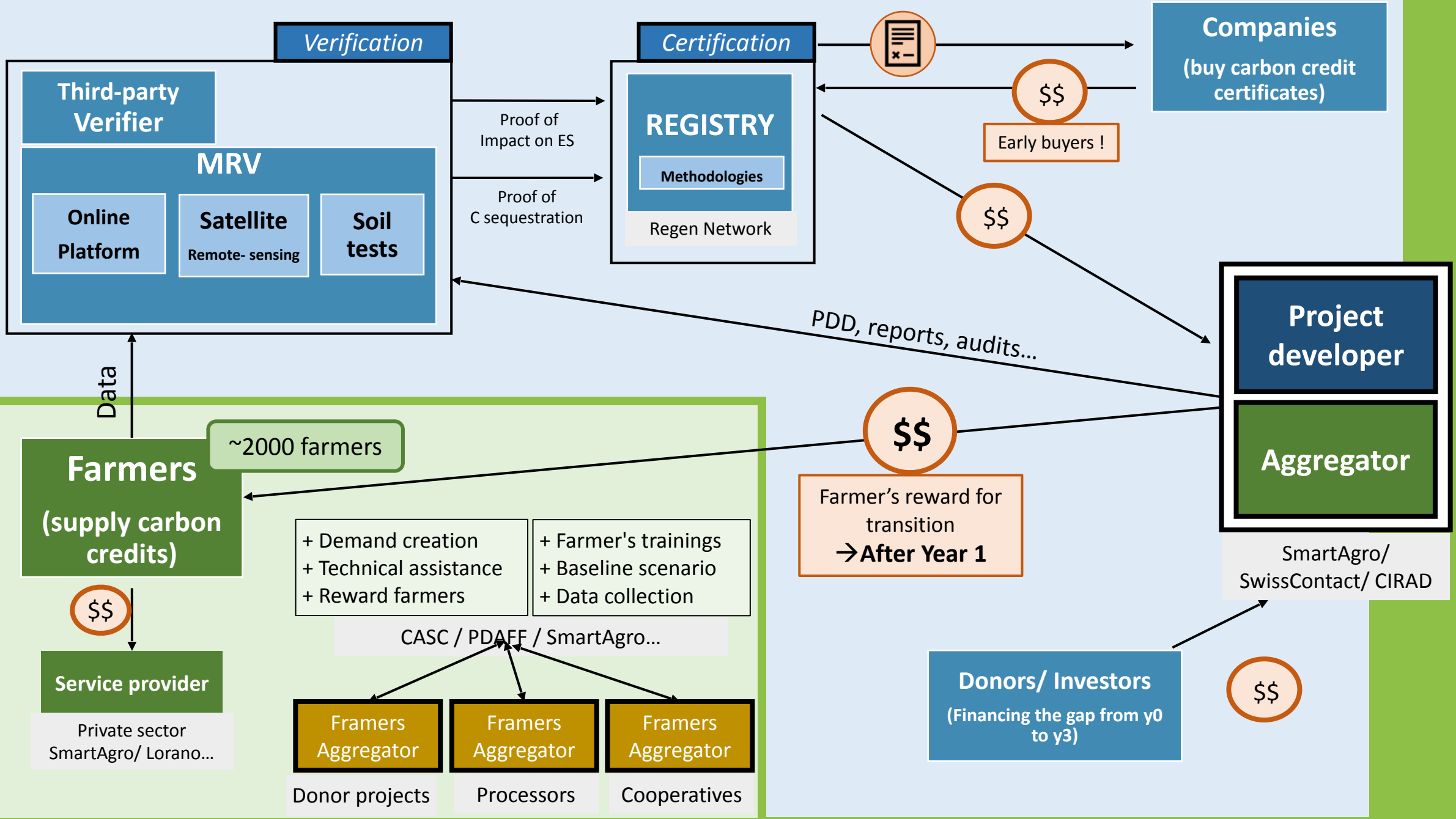


## Co-benefits



### Above ground biomass

We will encourage all plant diversity and endeavour to keep a living plant in the soil as much as possible.



## Key take-aways

- Land degradation and poor soil management has direct consequences on food security, climate change and livelihoods.
- Re-designed agriculture can be a solution.
- Farmers benefit additional revenue stream for carbon sequestration and ecosystem services production,
- GOLDEN SOIL program **bridges financing gap** and pays farmers already in the first year of transition to incentivize adoption of regenerative practices,
- GOLDEN SOIL program uses transparent blockchain based MRV technology and certified standards and connects to international marketplace.

# Partners:



# TA:





**Thank you!**