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Scaling regenerative agriculture in the Netherlands

Point of view 2024

Introduction

- Pressure on **environmental boundaries** affects the **productivity of agricultural systems,** which has negative consequences for food security and prices. This downward spiral highlights the growing importance of **reshaping our food systems.**
- As opposed to intensive farming and its related challenges, **regenerative agriculture** helps meet **society's changing needs** with regards to **limiting impact** on the planet and people.
- In this point of view, we aim to address:
  - What is regenerative agriculture, and what are its benefits and risks – specifically for the Netherlands (NL)?
  - What are the opportunities and challenges for food-agri players in scaling regenerative agriculture in NL? How can they collaborate?

- This document forms a **starting point** for conversations around regenerative agriculture, and is open for iteration.
- We base this research on the North-Western European context, and believe we need to create a food system where we apply the most relevant means of food production specific to this local context.
- Together, we can **specify opportunities** for value creation and capture, to make **better strategic choices** for your business.

Questions? Contact Tina Scheele (TiScheele@deloitte.nl) or Arthur de Wilde (AdeWilde@deloitte.nl).

Executive summary

1 Our current food system: Pressure is rising; change is needed

Netherlands (NL) exports €80bn worth of produce, leading to degrading **soil quality, biodiversity loss**

Most research calls out 50% more global food to feed 10bn people and climate change **aggravates pressures** on supply

A nitrogen overload, 30 Mt GHG emissions and **vast amounts of freshwater usage in NL.**

2 Benefits of regenerative agriculture: Solutions are readily available

Transitioning towards regenerative agriculture can provide a solution

by reducing tilling more pointy, permanent soil cover, intercropping, planned grazing and reducing synthetic fertilizer

This case study focuses on a selection of practices and contexts that can help us

to potentially reduce **GHG emissions** (-38%), **water** (-3%), nitrate pollution (-70%)

and help to achieve many of our sustainability targets, creating a future-ready system

3 Economics of regenerative practices can outperform conventional

Economic benefits of regenerative farming are positive and sustainable

Crop farmer case is positive , but dairy farmers need **additional support**

Economic benefits could show in **4 years** and payback period can take **8+ years**

4 The transition needs to be enabled by the entire value chain

The Dutch food system is **falling behind** compared to **global** regenerative **initiatives**

Majority of farmers are **willing, but lack perspective** on how to make the switch

To scale and capitalise on regenerative agriculture, we need to aqcuire **capital, new models** and **commercial knowledge**

Each player in the **value chain** has **distinctive roles** and **opportunities**

Farmers have various **financing options** to find investment and transition capital

5 Helping to accelerate Regenerative Agriculture in the Netherlands creating opportunities for all involved

Failing to **invest** in regenerative agriculture poses numerous **risks** for **value chain parties**

Investing in regenerative agriculture will eventually **polarize competitor models** in **winners** and **losers**.

Deloitte can help you to **assess** the **threat, strategize,** create new **business models**.

We do so through our proven **regenerative agriculture framework**

Our Current Food System

The amount of food we produce and the way in which we do so is under pressure.

Netherlands potential for Regenerative Agriculture

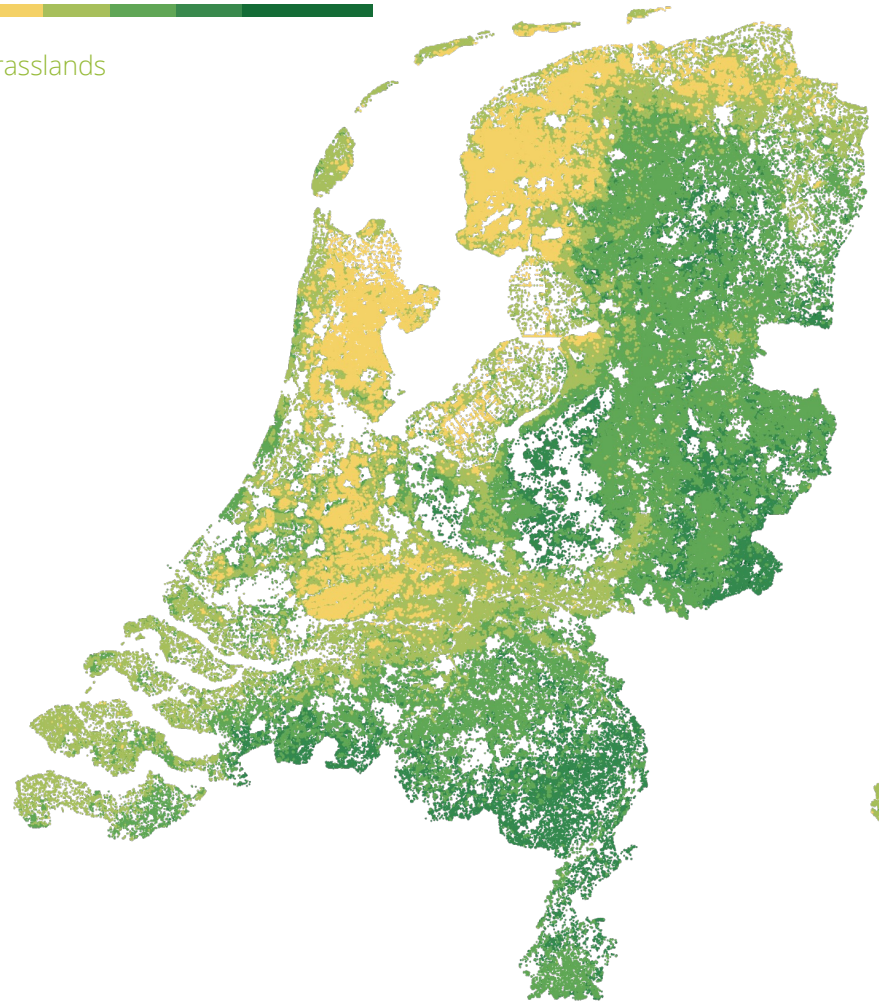
Netherlands potential

Analyzing indicators of regenerative agriculture potential (soil type, organic matter, bulk density, nitrogen deposition, Soil PH), we pinpoint the biggest opportunity in the eastern and southern regions of the Netherlands.

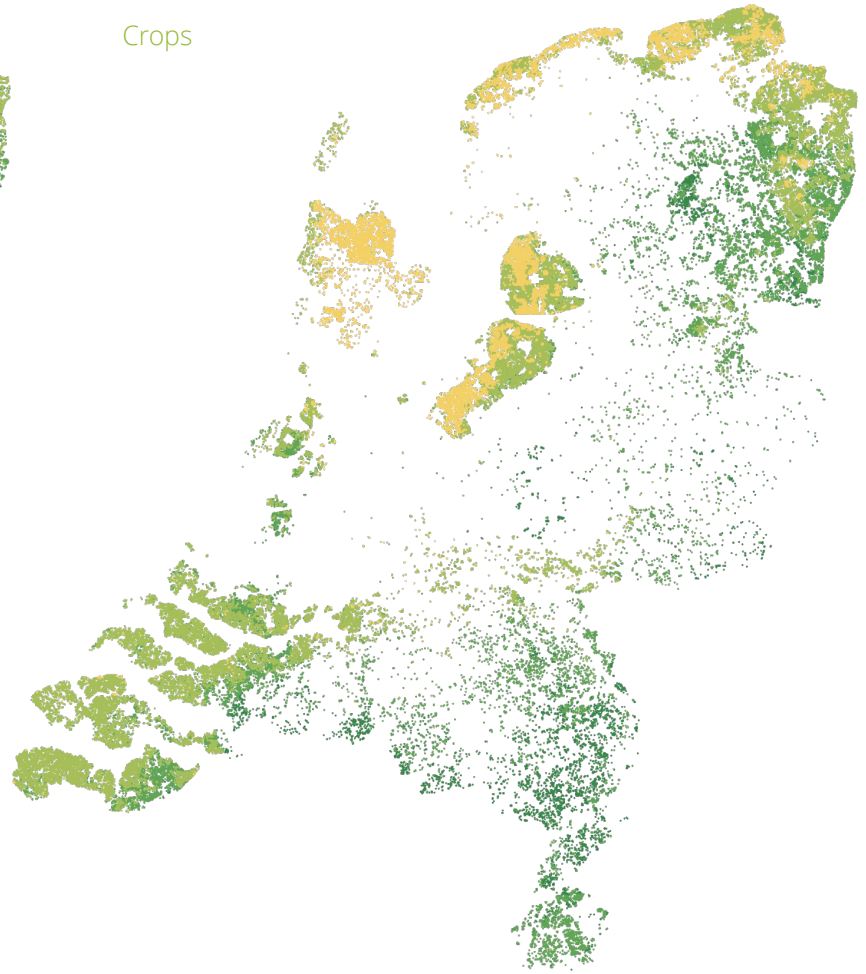
This is where we suggest to start with the transition to regenerative practices.

less potential **more** potential

Grasslands



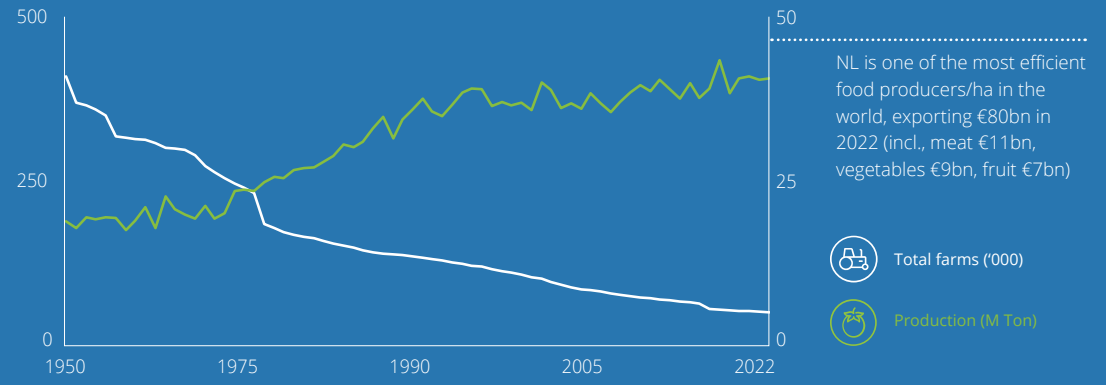
Crops



Our current food system

The Netherlands – a production powerhouse, exporting €80bn[1] of agricultural produce annually – has intensified its agricultural practices over the years, leading to a decline in soil quality and biodiversity.

Intensification of Dutch agriculture over time



(1) Domestic exports, excluding re-exports;
(2) Source: NRC (November 2023) 'Rapport: Europees beleid voor bodemverbetering faalt op alle fronten';
(3) Soil organic matter (i.e., organic material from plants, animals and microorganisms) is an important indicator of soil quality, as soil organic matter significantly improves the soil's capacity to store and supply essential nutrients, reduces soil erosion, improves water infiltration and water holding capacity, and increases the capacity to capture carbon in the soil; (4) Increasing soil organic matter in the soil is a natural way of capturing carbon in the soil, thereby lowering CO2 emissions.
Source: CBS, RLI (Raad voor leefomgeving en infrastructuur), Ecochain, EIP-AGRI, WUR, NRC, USDA.

Effect of intensification on NL soil quality

Reduced soil fertility

- 10% reduction in yield occurs as a result of subsoil compaction caused by the use of heavy machinery
- **21.4%** of **forest** and **18.5%** of **natural soils** have **poor** or **moderate acidity**
- The Netherlands ranks highest in Europe for soil pollution caused by fertilizers.

Reduced water quality and storage

- **33%** of **forest** and **37%** of **natural soils** are strongly or moderately **dried out**
- **The Netherlands has the poorest water quality among all EU member states.** With **only 1% of Dutch waters classified as 'good'** according to the European Water Framework Directive (WFD) assessment in 2019

Reduced ability to store CO2

- Grasslands and wetlands **emitted 2.5%** and **9.1% more GHG,** respectively, in 2017 than in 2016
- The various **fractions in organic matter** are **significantly reduced** in agricultural and forest soils[3]; **restoration** is **necessary** for **food production** and **CO_2 sequestration**[4]

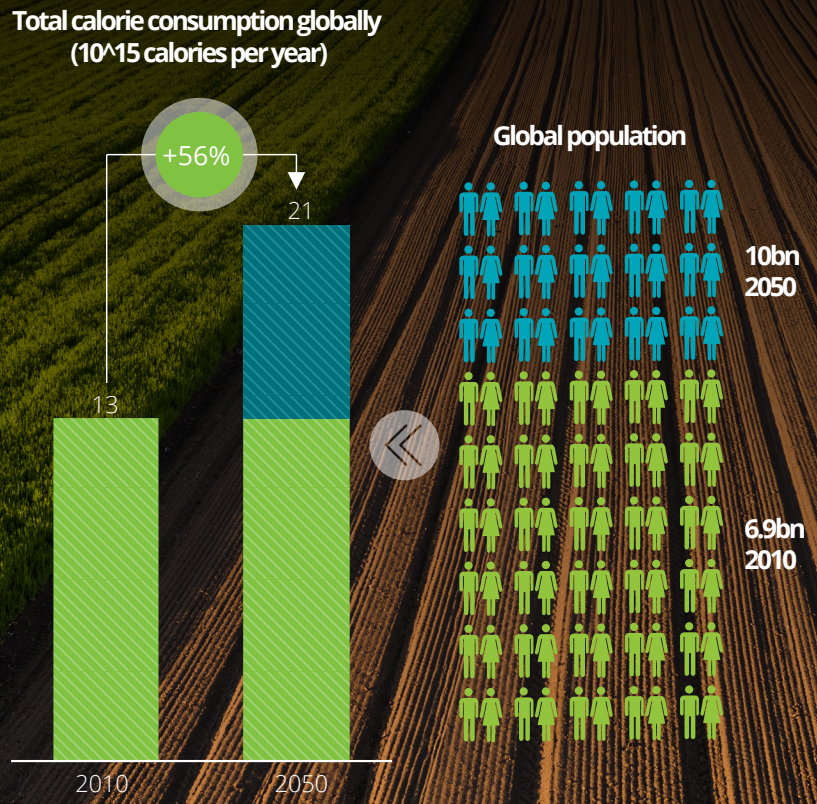
Reduced nutrients

- **Fruits and vegetables** used to be much **richer** in **vitamins** and **minerals** (e.g., 1950s broccoli had 130mg of calcium, versus 48mg today)

Biodiversity loss

- **46** out of **52 protected ecosystems** are in **moderate** to **poor condition**
- On average, **characteristic animal species decreased** by **50%** in agricultural and open natural areas

We will need 56% more food to feed nearly 10bn people globally in 2050...



Our current food system

Food demand is projected to rise through 2050, while climate change is intensifying pressures on food supply, resulting in negative outcomes for food security and food prices.

... but climate change is pressing on the ability of our soil to produce food...

In the last 100 years we **lost 1/3 of the topsoil** ground worldwide.

Land degradation currently affects **1.7 billion hectares** of land

The industrialised countries **lose soil** at a rate **17 times** higher than it takes to generate new topsoil

... as well as on the availability and quality of fresh water

70% of freshwater globally is used for agriculture (2,000-5,000 litres of water to produce a person's daily food)

Over the past 20 years, terrestrial water storage has dropped at a rate of **1cm per year**

Increased temperatures and more frequent floods and droughts due to climate change **deteriorate water quality**

The world grows **95%** of its **food on topsoil.** If we continue to degrade the soil at the rate we are now, the world **could run out of topsoil** in about **60 years.**

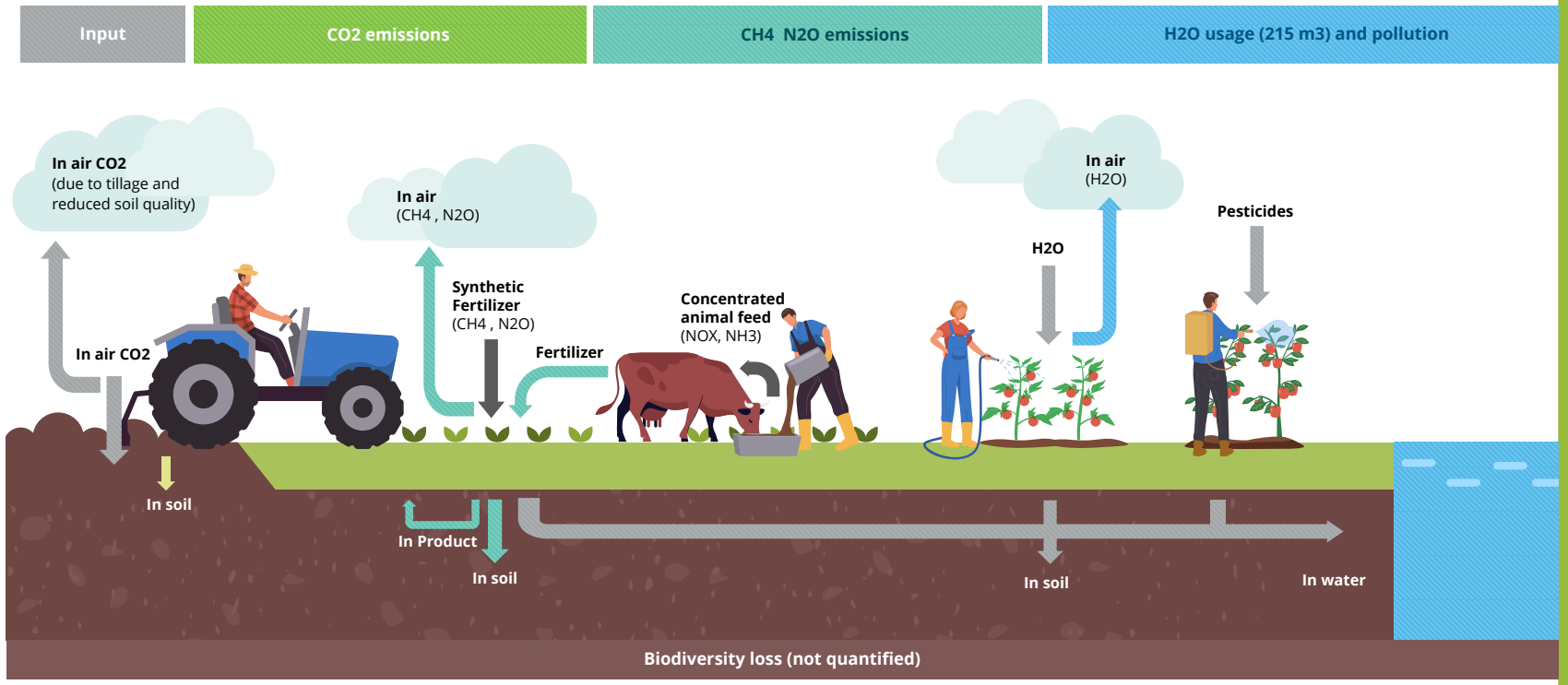
Agriculture is the largest **user of freshwater** worldwide, but the long-term availability of water is of growing concern due to **increased food demand** and **climate change.**

Note: Calorie consumption is expected to grow faster than global population (percentage-wise) from 2010-2050, since expected growth of income per capita would result in growing calorie consumption per capitaSource: FAO, Swiss Environment Technology AG, UN, IPCC

Our current food system

The Dutch agriculture sector annually accounts for 28 Mton CO2-equivalent GHG emissions, water usage (215M m3) and pollution. Mainly due to natural fermentation by livestock, use of synthetic fertilizers, land-use changes and use of fossil fuels.

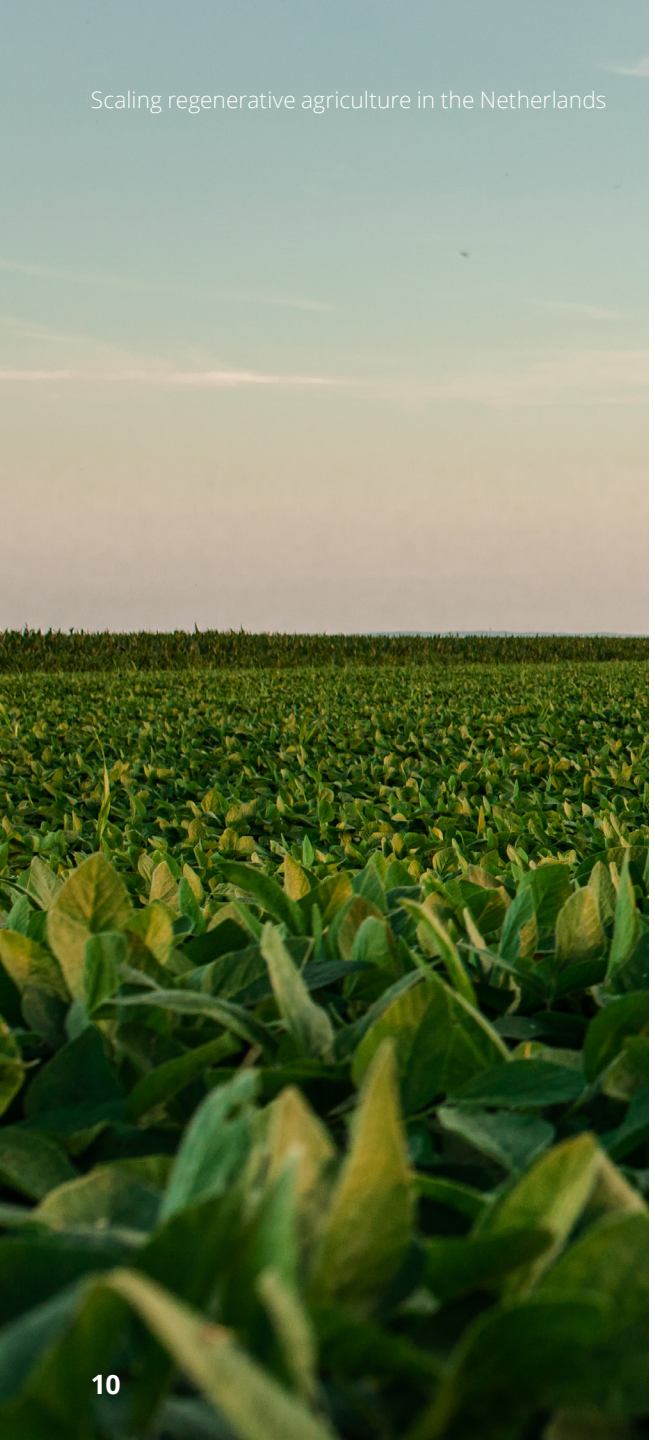
Environmental impact of agri-food sector in the Netherlands (2021)



Source: CBS; Note: (1) scope 1 and 2 emissions; (2) In total, agriculture in the Netherlands in 2021 had a GHG footprint of 28 Mton, 9 Mton for natural gas use, 9 Mton for fermentation by livestock, 3 Mton for manure, 4 Mton for stables and manure storage, 1 Mton for vehicles, and 2 Mton for others.

Benefits of regenerative agriculture

There are readily available solutions to tackle the growing problems and turn the tide.



Benefits of regenerative agriculture

The transition to regenerative agriculture can provide a solution to food supply & demand, soil quality, nutrient reduction, biodiversity loss and GHG emission challenges.

Key principles

Soil health as entry point for ecological, economic and social benefits

Soil dynamics should be treated as one of the most **complex systems** on earth

Integrate nature and agriculture with focus on circular economy and biodiversity conservation

No solution fits all, implementation is dependent on unique farm conditions **(nature and location)**

Key benefits

Improved Soil Health: Enhances soil fertility, structure, and moisture to **store and supply essential nutrients**

Increased capacity to **capture and sequester carbon**

Increased capacity to **capture and retain water, improving water quality**

Improved **resilience** to extreme climate, and **stable yields**

Reduced Need for Inputs: Less reliance on synthetic fertilizers and pesticides.

Benefits of regenerative agriculture

Regenerative agriculture encompasses a variety of practices aimed at restoring and enhancing the health of agricultural ecosystems. Some key regenerative agriculture practices include permanent soil coverage, planned grazing, reduced tillage and reduced chemical use.

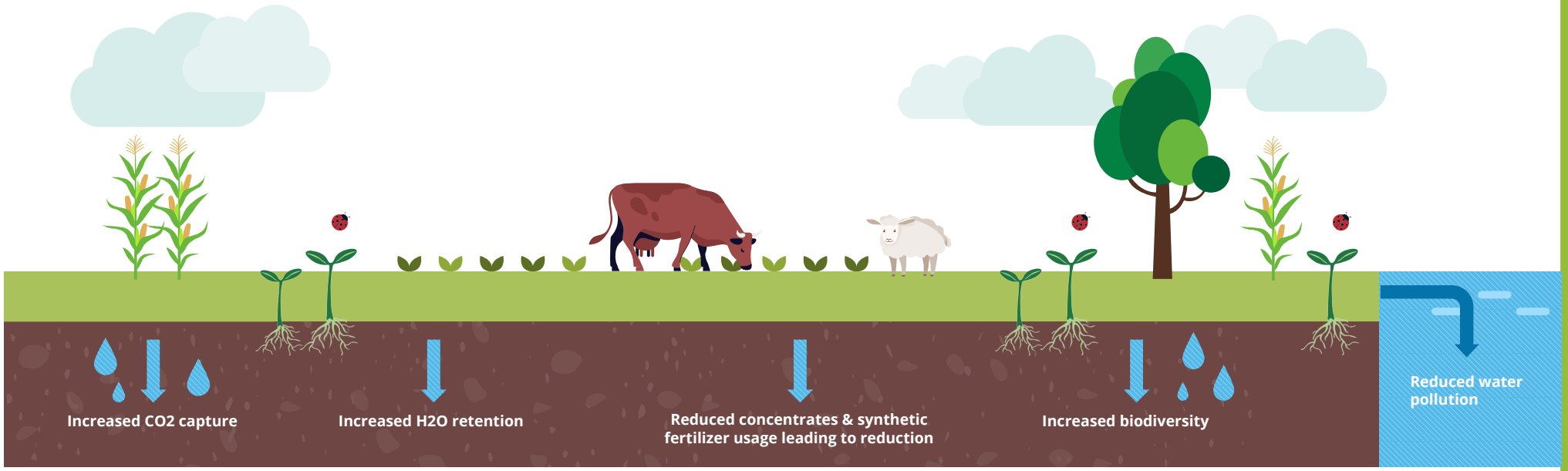
Highlighted regenerative farming practices[1]

Permanent coverage of soil
Permanent coverage of land (cover crops), multiple crop species grown simultaneously/sequenced or different crop with higher carbon capture

Planned grazing
Managed grazing practices for livestock, to restore grasslands, prevent overgrazing, and enhance soil fertility.

Reduced tillage
Direct seeding and/or minimal mechanical soil disturbance through non-turning soil cultivation

Reduced chemical usage
Minimization or elimination of biocidal chemicals. Using naturally derived chemical alternatives where necessary



Source: (1) Regenerative practices shown here are not exhaustive; other practices include agroforestry (integration of trees and crops on the same land), diversified crop rotation, and composting; Source: Rodale institute; Expert interviews

Benefits of regenerative agriculture

There is no universal definition for regenerative agriculture. This case study focuses on regenerative agriculture practices, which include reduced tillage, permanent soil cover, agroforestry, reduced chemical usage, and planned grazing.

Regenerative agriculture practices

Cropland

Agroforestry	Integration of trees and shrubs into the cropland, to increase biodiversity and reduce water evaporation
Composting	Collecting and recycling organic matter, such as leaves and food scraps, and using the compost as fertiliser
Livestock integration	Integrating livestock with selected crops, allowing cattle to graze on cropland to fertilise and prevent pests
Reduced tillage	Direct seeding and/or minimal mechanical soil disturbance through non-turning soil cultivation
Permanent coverage of soil	Permanent coverage of land (cover crops) – multiple crop species grown simultaneously, or temporal sequences
Reduced chemical usage	Minimisation or elimination of biocidal chemicals, using naturally derived chemical alternatives where necessary
Diversified crop rotation	Growing different crops in succession on a piece of land, to avoid exhausting the soil
Intercropping	Growing different crops simultaneously on the same piece of land, either in strips or side by side

Grassland

Agroforestry	Integration of trees and shrubs into the grassland, to increase biodiversity and reduce water evaporation
Inter-seeding	Planting of other grasses, vegetables and herbs on the grassland, leading to reduced food concentrates usage
Planned grazing	Farmers decide where and for how long the animals graze a particular patch of land
Reduced chemical usage	Minimisation or elimination of biocidal chemicals, using naturally derived chemical alternatives where necessary

Included in our 'Case for Regenerative Agriculture'

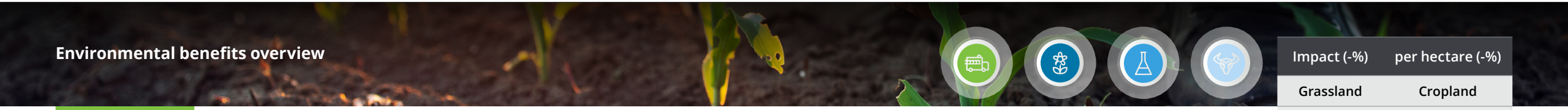
Fundamental as prerequisite for other practices

Not included in our case study

Source: Rodale institute; NRDC; USDA; BCG and NABU; Expert interviews

Benefits of regenerative agriculture

In Northwest Europe, the selected regenerative agriculture practices can reduce GHG emissions significantly (-38%) while also limiting water use (-3%), (nitrate) decrease pollution costs (-70%), and reverse biodiversity loss.



Environmental benefits overview

						Impact (-%)	per hectare (-%)
						Grassland	Cropland
GHG (CO_2eq)		• **Reduced tilling** lowers soil decomposition, which **improves carbon stock** when combined with practices that increase belowground biomass, such as **cover cropping** and **crop rotations** • Reduced tilling increases **nitrogen fixation** through legumes, which are a renewable source of nitrogen, **reducing** the need for **nitrogen inputs (fertiliser)** • Cover crop **roots capture nitrogen** that would otherwise leach out into soil	✓	✓	✓	✓	~40%[4]	~40%
Ammonia (NH_3)		• **Reduced** livestock **concentrates needed,** due to more varied diet from enriched grasslands[1]	✓	✓	✓	✓	~20%	N/A
		• **Less** (synthetic) **fertiliser** is needed as healthy soil will subtract nitrogen on its own[2]	✓	✓	✓	✓	N/A	~10%
Water	Use	• **Increased organic matter improves** the soil's **water-holding capacity**; tillage disrupts transport pathways, and reduces both infiltration and water-holding capacity[3]	✓	✓		✓	~20%	<5%
	Pollution	• **Reduced** use of **fertilisers** and **pesticides** (facilitated by the other regenerative agriculture practices) results in less pollution of ground water			✓		~20%	~80%
Biodiversity loss		• Reduced use of **pesticides prevents degradation of biodiversity** • **Intercropping** and **cover cropping promote biodiversity** that benefits biological pest control and pollination • Reduced tillage increases **organic matter in the soil, increasing below-ground biodiversity**	✓	✓	✓	✓	✓ Not quantified	

1) A changed diet of more silage maize and concentrated food with 10% less protein has no negative effect on milk production and health of cows (Chowdhury et al. (2023) "Feeding lower-protein diets (...) improves nitrogen use efficiency in dairy cows");
2) Assumed this only impacts cropland;
3) Estimate based on average 3% increase in water-holding capacity;

4) This figure considers reduction in GHG emissions from the soil only (not considering livestock GHG emissions) – when incorporating emissions from cows on grassland, the GHG reduction accounts for 9% of total GHG emissions.Sources: World Resource Institute "Regenerative agriculture: Good for Soil Health, but Limited Potential to Mitigate Climate Change"; KE Giller et al, 2021, "Regenerative agriculture: An agronomic perspective", BCG and NABU (2023) "The Case for Regenerative agriculture in Germany – and beyond", UNFCCC, De Groene Amsterdammer, CBS, WUR

NB: the figures for GHG, water use & pollution, and biodiversity loss are based on data from Germany. However, data is validated for the Dutch context, and appears to be coherent at first sight.

Benefits of regenerative agriculture

For the Netherlands specifically, a 100% transition to regenerative agriculture could potentially achieve up to 40% of our NL GHG emission goals in agriculture, whilst improving soil health water quality and biodiveristy at both crop and dairy farms.

Regenerative agriculture in NL: environmental impact comparison

Impact based on full switch to regenerative		Impact NL (yearly)	Climate ambition Netherlands	
			NL ambition	% reached with regenerative agriculture
GHG (CO_2eq)		- 3-4 Mton	• **55% reduction** compared to **1990 levels** in 2030 (228 Mt to 100 Mt) • For the **agriculture sector,** reduction of **9 Mt of GHG by 2030**	• **4%** of ambition (compared to 1990), **8%** of total reduction emissions target 1 • **~30-40%** of ambition of agriculture target
Ammonia (NH_3)		- 22 kton	• **39 kton** reduction by **2030**	• **55%** of ambition
Water	Use	- 16m m^3	• N/A	• N/A
	Pollution	EUR 200M	• Reduce nutrients and pesticides by **50% by 2023** compared to 2013 in water in agricultural areas	• **>100%** of ambition
Biodiversity loss		Decreased	• N/A	• N/A

NB: the figures for GHG, water usage & pollution, and biodiversity loss are based on data from Germany. However, data is validated for the Dutch context, and appears to be coherent at first sight.

Note: Mton = megaton; (1) Currently, the total GHG emissions in the Netherlands is 152 Mt, so the estimated impact of -4.4 Mt would be ~8% of the total reduction required to achieve the 2030 ambition of 100 Mt.Source: Rijksoverheid (Klimaatakkoord 2022), WUR, CBS, RIVM, BCG and NABU

Economics of regenerative agriculture

The reality of farmer economics of moving to regenerative practices.

Economics of regenerative agriculture

Economic benefits of regenerative farming could incentivise farmers. The benefits for crop farmers include avoided yield loss, additional income from carbon credits, and reduced fertiliser and crop-protection costs.

Farmer profit impact by profit driver (steady state (6-10 years), excl. subsidies)[1]

						Profit impact
						Cereal and oil seed[2]
Farmer profits	Revenues	Yield	• **Avoided yield loss** during droughts, and yield uplift due to higher water retention, less evaporation and recovered groundwater[4]	✓	✓	✓	+34%
		Price	• Excluding impact of potential price premium due to improved quality of produce				
		Other	• **Carbon credit income** due to improved soil carbon capture[3]	✓	✓	✓	+17%
	Input costs		• **Synthetic fertiliser** and **crop-protection reduction** due to fixed nitrogen in soil and better soil quality			✓	+75%
			• **Additional seed cost** for cover cropping (e.g., legumes and herbs) and undersown cropping		✓		-22%
			• **Additional biofertiliser** cost dependent on availability of manure and biomass within farm system			✓	-27%
	Operating costs		• **Reduced tillage** and seed preparation decrease machine costs and fuel consumption[4]	✓			+35%
			• **Additional machinery costs** for subsoiling, cover cropping and direct seeding[4]		✓		-46%
			• **Additional costs** for **soil analysis**	✓	✓	✓	-1%

NB: this impact is based on data from Germany, which is assumed to be similar across North-West Europe.

There is a chance that the impact is less in the Netherlands compared to Germany, due to the richness of NL soil and greater water availability.

(1) Figures based on analysis done on German farming conditions and including implementation of better soil structure, cover cropping, soil nutrient balancing, undersown cropping, minimal soil-disturbing mulch system and biofertilizer;
(2) Based on analysis of winter wheat 50%, barley 30%, rapeseed 20%;
(3) Diminishing returns over time expected; assumed net profit of 38 €/ha until 2035; and excluding potential income from nitrogen reduction;

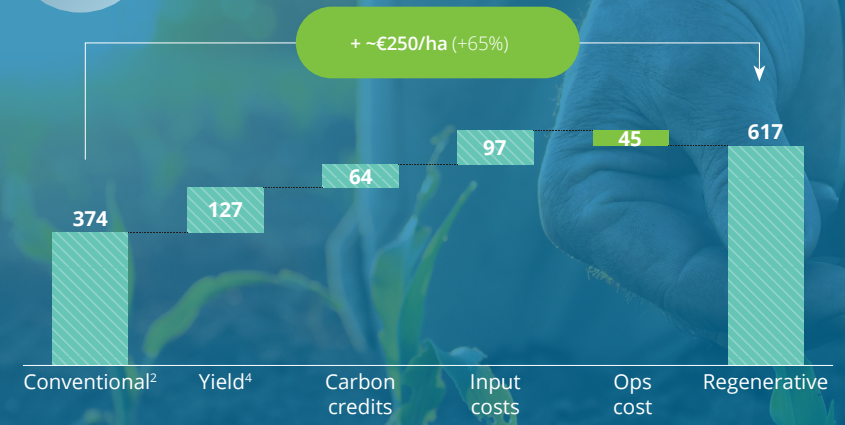
(4) Asset depreciation not considered, assumption based on machinery lease; Sources: KTBL calculator; FAO (Advances in Conservation Agriculture; Volume 2); 2030 Carbon certificate consensus range; Bloomberg; Princeton; World Bank Group; CDP; Seed producer price average; Bavarian ministry of agriculture Contribution margin calculator; agrarheute.com; Chiemgau-agrar.de; The Case for Regenerative Agriculture in Germany and Beyond – BCG and NABU

Economics of regenerative agriculture

For cereal crop farmers, regenerative practices could outperform conventional methods by ~€250/ha after 6–10 years. For dairy farmers, lower yields will result in lower profits, if current ways remain unchanged.

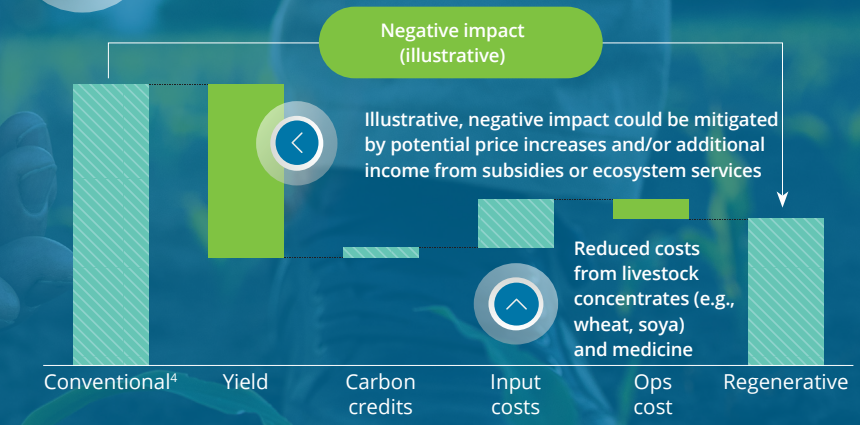
Farmer profit conventional and regenerative (in €/ha, (6–10 years), excl. income from subsidies and price impact)[1]

Cropland



Please note: this impact is based on data from Germany, extrapolated to the NL context.

Grassland



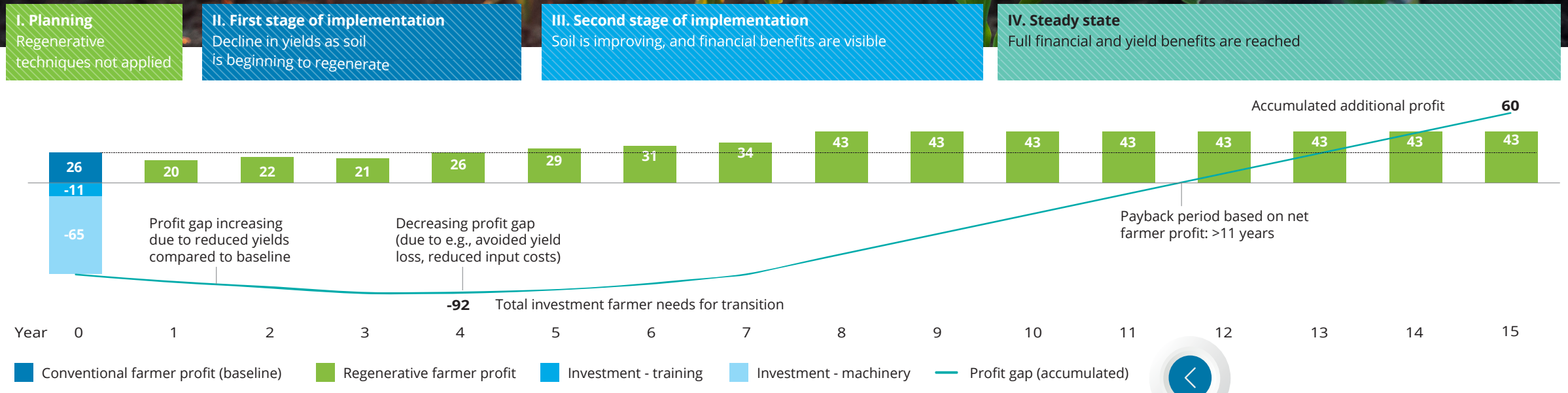
Note: the impact for dairy farmers is based on data from the Netherlands (in contrast to the data for cropland farmers)

(1) Figures based on analysis of German farming conditions, applicability to Dutch farming conditions (resource and nutrient requirements) to be validated at a later stage;
(2) Income from normal operations, based on five-year avg. baseline '18–'22, excluding crop rotation;
(3) Based on analysis of winter wheat 50%, barley 30%, rapeseed 20%;
(4) Calculated as avoided loss in a drought year due to improved resistance of soil, excluding (negative) effect of intercropping; (5) Average income from normal business operations dairy farms of 100–250, 250–500 and >500 cows; '15–'19; Sources: Wageningen economic research, The Case for Regenerative agriculture; Deloitte analysis, De Natuurverdubbelaars

Economics of regenerative agriculture

However, the benefits of regenerative farming take time to materialise, with an expected payback period of >11 years for an average Dutch crop farmer's initial investment.

Profit build-up and payback period (farmer profits in €k/year; plot size 60 ha)



Notes: Assumed that 50% of machinery investment is needed as upfront investment. Remainder is covered in leases already incorporated in conventional P&L; Payback calculations are based on the economic benefit of transition to regenerative using net profit above conventional farming income; Price premiums have been excluded from this analysis; analysis describes scenario where farmer makes transition with 100% of land; more realistic would be a phased transition; Data based on indicative assessment of German BCG report and Dutch Agrimatie P&L.

Accumulated gap in profit (due to investments or reduced yields) compared to situation where no regenerative techniques would be implemented

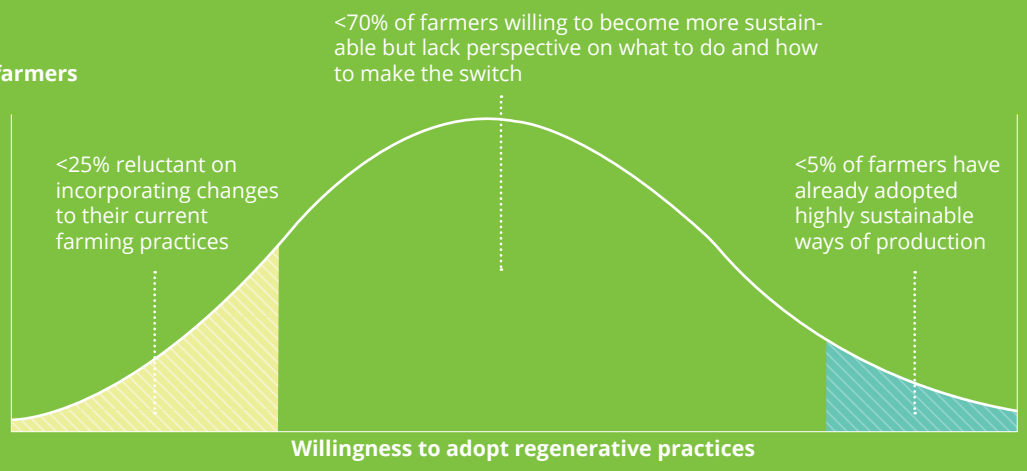
The move to regenerative agriculture

Despite the expected benefits, accelerating change is challenging.

The move to regenerative agriculture

Some farmers have already made the step towards regenerative agriculture. Many others are willing, but lack perspective on how to make the switch.

Willingness to adopt regenerative practices by Dutch farmers



Sources: Eurostat, WUR (2023) 'Melkveehouders over verduurzaming in de melkveehouderij'

Concern	Possible solution
Lack of a viable business model	**Develop and promote sustainable business models that integrate profitability with environmental and social sustainability**
Knowledge gap	**Provide education, training and support to farmers to enhance their understanding of sustainable practices**
Changing government policies	**Advocate for stable and consistent policies that support and incentivise sustainable farming practices**
Lack of a clear & shared vision	**Improve communication and collaboration between farmers, government and companies to establish a shared vision for sustainable farming**
Negative public image	**Implement tailored communication campaigns to increase public awareness and understanding of sustainability efforts made by farmers**

The move to regenerative agriculture

To scale regenerative agriculture, capital, increased awareness and knowledge, and a viable commercialisation pathway are needed.

Prerequisites for transition to regenerative agriculture

Financing the transition

- **Farmers need to** find **necessary upfront investment capital** and **transition capital** to transition to regenerative farming (yield in the early years might be lower than normal)
- Financial institutions to engage in **longer-running loans** for farmers
- Insurance companies to play a role in **insuring against yield loss** in transition years
- **Government** to supply **subsidies** for granted **ecosystem services**
- Viability for grassland dependent on **price premiums** or **government subsidies**

Farmer enablement

- Improved **willingness** by **farmers** to embrace new practices, through **increased knowledge of benefits and cultural change**
- **Improved awareness** regarding the environmental impact of food products of consumers
- **Build-up of specific knowledge** about unique situations of different farms, products and local contexts, enabling effective implementation
- **Ecosystem of regenerative agriculture input providers** (e.g., equipment, seed, biofertilisers, monitoring)

Viable commercial model

- **Processors and producers** to engage in **long-term farmer contracting**, to provide volume stability
- Public and private entities to collaborate on **lower accreditation cost** for **regenerative organic certified** products
- **Business models** in which a **premium** is **captured** for **regenerative** products
- Valorise **carbon sequestration** through carbon credits
- **Develop standardised definition and transparency** on regenerative agriculture in NL and beyond
- **Certification** of regenerative agriculture standard products

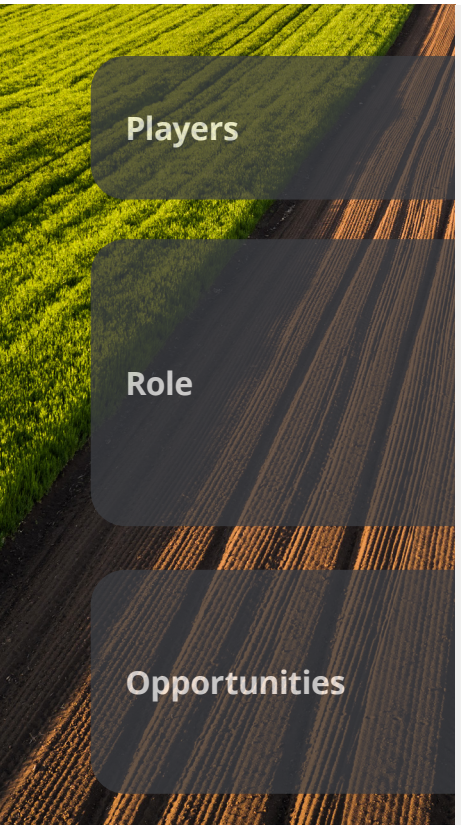
Key influencing stakeholders:

Companies	Companies	Companies
Government	Government	Government
Researchers	Researchers	Researchers

Opportunities in regenerative agriculture

Each ecosystem player has distinct opportunities and roles, to support – and benefit from – the transition.

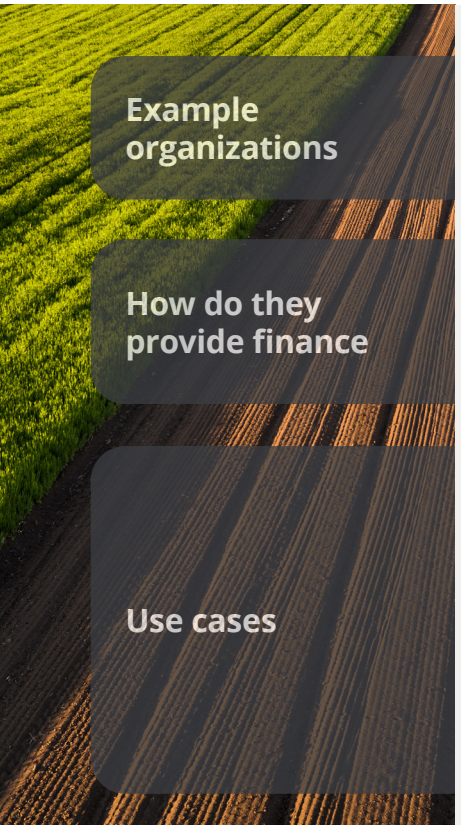
Role and opportunities per ecosystem player



	Input providers	Processors and producers	Distributors and retailers	Financial institutions	Policy makers	Researchers
Players	syngenta, John Deere, agrifirm	Unilever, Danone, Cargill, Nestlé	vermaat, Jumbo, Albert Heijn, crisp	Rabobank, Triodos Bank, FMO	Rijksoverheid, European Commission, FAO	Wageningen University & Research, Global Soil Partnership, eip-agri
Role	• **Promote use of regenerative inputs**, by creating awareness of environmental and economic benefits	• Provide stability to regenerative farmers, by engaging in **farmer volume guarantees** (e.g., long-term contracting) • **Facilitate scaling of information to farmers**	• Establish **sourcing requirements** to **prioritize products** from regenerative farms and fuel differentiation • Support **customer research** to test potential for **differentiated pricing** and **active promotion**	• Financial institutions to engage in **longer-running loans** for farmers • Insurance companies to play a role in **insuring against yield loss** in transition years	• Develop **supportive policies** that **provide (financial) incentives** to make transition, such as subsidies and tax incentives • **Fund** and accelerate **research** on **specific conditions** in NL	• **Generate evidence-based knowledge** to build the case for adopting regenerative practices • Drive development of **best practices** and **guidelines based** on NL context
Opportunities	• **Develop** cost-attractive **regenerative inputs** (e.g., biofertilisers) • **Create advisory branch** to help farmers adopt **regenerative agriculture**	• **Capture a share of the price premium** • Reduction of **Scope 3 emissions and the ESG goals** • Opportunity to differentiate your brand from competitors	• **Capture a share of the price premium** • Reduction of **Scope 3 emissions and the ESG goals** • Opportunity to differentiate your brand from competitors	• Develop viable **farmer financing options** and explore specific **financing products/ terms**	• Leverage regenerative agriculture to make significant progress on **climate targets**	• **Build expertise** and **become a global leader** in regenerative agriculture practices

Financing options for the move to regenerative agriculture

Fortunately, farmers have various financing options to fund upfront investment and provide capital to transition to regenerative agriculture; however, the scale of these specified offerings is still too limited.



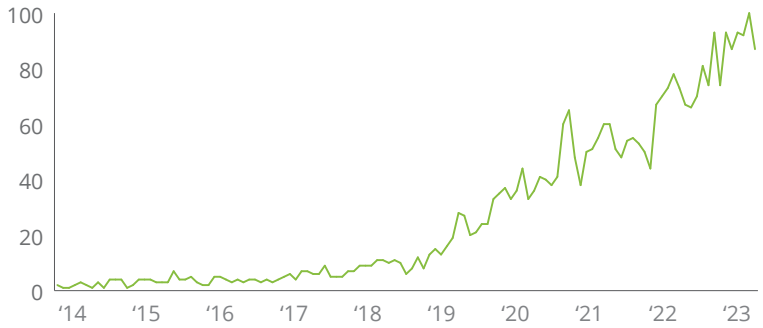
Financing options	Input providers	Processors and producers	Distributors and retailers	Financial institutions	Policy makers
Example organizations	European Investment Bank, Rabobank, Triodos Bank	STICHTING DOEN NATIONALE POSTCODE LOTERIJ, mySOILCAPITAL, VP Capital	Funded by the European Union, Limburgs Energie Fonds, Ministerie van Landbouw, Natuur en Voedselkwaliteit	reNature., lenteland, eit Food	Crowd About Now, OnePlanet CROWD, Klim
How do they provide finance	• Debt providers (possibly with interest discount) • Equity investments	• Debt providers • Equity investments	• (Low-interest) debt providers • Subsidies	• Debt providers • Bridging farmers to funding sources, knowledge and impactful relationships	• Crowdfunding platforms connect individual investors with farmers
Use cases	• **McCain** and **Rabobank** help farmers transition to regenerative agriculture (technically, commercially and financially) • **Triodos Organic Growth Fund** specifically focuses on investments in organic and sustainable agriculture projects in Europe	• **DOEN** provides subsidies and loans to parties active in regenerative farming (e.g., Lenteland) • **Soil Capital** pays farmers for carbon reduction on their farm-land	• The **Dutch Government** invests €129m in the Re-Ge-NL innovation programme. This programme is designed to bring about the transition to a regenerative, profitable and socially supported agricultural sector	• **Lenteland** develops farms (5 to 25ha) following the community-supported agriculture model • **ReNature** supports farms in all steps of scaling up their farms, from business idea to fundraising to maintenance	• **Oneplanetcrowd** facilitated a fundraise of €670k (from 336 funders) for regenerative farm Schevichoven • **Klim** pays farmers for carbon sequestering or other environmentally focused interventions (e.g., restoring hedges and/or planting flower strips)

The move to regenerative agriculture

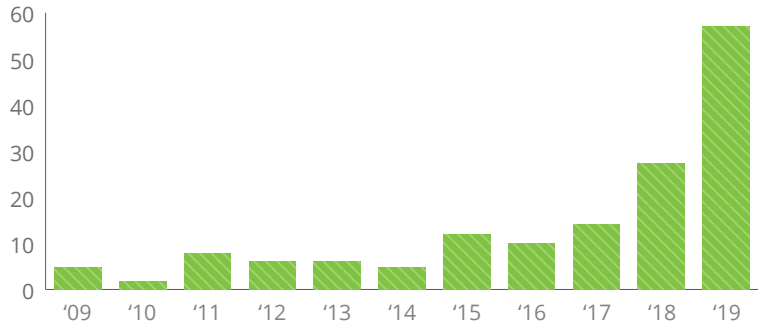
New insights and initiatives are arising, as regenerative agriculture has recently received considerable attention across the food value chain. There is urgency to act now; NL is falling behind the EU and global movement.

Public, research and institutional attention has grown over time

Public searches of "regenerative agriculture"[1]



Scientific publications using term RA



NL investments

The **Dutch government** announced its intention to **invest €129 million** in Re-Ge-NL.

This is a programme with **strong focus** on research and **regenerative practices.**

Currently, coordinated initiatives from the **food value chain are lacking.**

Dutch farmers

At this moment in NL, **only a small number of crop farmers are practising regenerative agriculture at scale.**

They are doing so through a **diversified revenue model,** capturing a premium on products, running educational programmes and supplying to surrounding markets.

(1) Numbers represent interest relative to the highest point on the chart where a value of 100 is the peak popularity and a value of 50 means the term is half as popular; Sources: Google Trends; Newton et al. (2020),Sources: metnatuurmee, WUR

Launched regulatory initiatives and measures

EU **Farm to Fork strategy** (2020) aims to reduce **use of pesticides** (50%) and **fertilizer** (20%).

The **'Quatre promille'** initiative aims to demonstrate that agriculture, and in particular **agricultural soils,** can play a **crucial role** in **food security** and **climate change.**

Common Agricultural Policy (CAP): Under CAP, there are **funding opportunities** and **incentives** for farmers to adopt sustainable and regenerative agriculture practices.

Opportunities and risks

How we can scale regenerative agriculture together.

Risk of doing nothing

Failing to invest in regenerative agriculture poses numerous risks for value chain parties; not being able to comply with lowering scope 3 emissions, losing market competitiveness, and decline in long-term viability.

Financial institutions

- Lost **business**, with farmers switching to other providers
- Missing out on **sustainability benefits** of transitioned customer base/farmers
- Missed **learning opportunity** and **ability to scale** (sustainability financing, carbon banking) when applied to other segments
- **Not meeting evolving** investor/ stakeholder **expectations on social responsibility**
- Lower **impact on long-term viability,** as environmental impact becomes more prominent

Input providers

- **Reduced demand** for traditional products & services, losing competitive market share and position:
- **Fertilisers:** Decrease/ban of synthetic fertilisers
- **Feed producers:** decrease in synthetic ingredients, circular feed models, lower concentrated feed intake
- **Pesticides:** Strong decrease in synthetic pesticides
- **Seed:** Changing needs (farmers apply seed saving; different crop portfolio, 'sustainable' seeds)
- **Agri machinery:** low demand for traditional machinery on fields
- **Missed revenue opportunity** in growing market for sustainable agricultural inputs
- Falling behind in innovation, leading to **risking market relevance**

Processors / FMCG

- Losing **competitive differentiation**, and potential **market share loss**
- **Negative impact** on **sourcing** and **supplier relationships**
- Risk **of supply chain disruptions** and **higher input** costs/lower yields
- Losing **progressive farmer base**
- **Failure** to **meet** growing market segment – potentially missing out on sales and revenue
- **Missed revenue opportunity** in growing market for sustainable sourced products
- Not being able to meet **regulatory challenges** and **compliance issues (Scope 3 emissions)**
- Lower **impact on long-term viability,** as environmental impact becomes more prominent

Retailers / Distributors

- Losing **competitive differentiation,** and potential **market share loss**
- **Negative impact** on **sourcing** and **supplier relationships**
- Risk **of supply chain disruptions** and **higher input** costs/lower yields
- **Missed revenue opportunity** due to not meeting consumer preferences/ growing market segment
- Exposure to **regulatory challenges** and **compliance issues (Scope 3 emissions)**
- Lower **impact on long-term viability,** as environmental impact becomes more prominent

Opportunities within regenerative agriculture

Investing in regenerative agriculture will eventually polarize competitor models into winners and losers. Winners will start the transition now to secure their farmer base and establish commercial product differentiation.

Financial institutions

- Develop new, viable **farmer loan products or financial packages** to provide short-term financial support for transitioning
- Set-up **new business models** with **new revenue streams:**
  - **Financial consulting and advisory** services to guide farmers in the transition (financial and risk mitigation)
  - **Insurance products** to address transition risk and changes
  - **Carbon credit / biodiversity financing** (verification and issuance)
  - **Education resources and training**
  - **Partner up with AgriTech** to jointly develop propositions (Financial funding models of machinery etc)
  - **Green Financing programs** to incentivize and attract conscious farmers

Input providers

- Opportunity to **innovate, differentiate** and **extend products/ services portfolio:**
  - **Fertilizers:** organic fertilizers (e.g., from biogas installations, 'personalized' fertilizers)
  - **Feed producers:** regeneratively-grown and circular feed ingredients, focus on nutrients with potential shortages Pesticides: Organic pesticides/herbacides, enabling farmers to locally 'brew'
  - **Seed:** preference for heirloom, open-pollination and GMO-free seeds, different plant mix (cover crop/intercrop)
  - **Agrimachinery:** new types of machines (low-tillage, smaller tyres, different harvesting) and new leasing models
  - **Services:** farmer education, soil and biodiversity measuring, CO2 tokenization / monetization / certification
- **Develop new business models** with **new revenue streams** (e.g., farm data management, advisory, circularity)
- Take a **orchestrating role** in the chain, connecting up & down stream players
- Start farmer transition now to lock in **regenerative farmer base**

Processors / FMCG

- Start farmer transition now to **lock in regenerative farmer base**
- Forge **exclusive sourcing agreements** by partnering with farmers, gaining a **competitive advantage**
- **Secure a consistent supply** of produce, **mitigate disruptions**
- **Achieve cost savings** and potential reductions in input costs over time, **enhancing profit margins**
- Explore opportunities for **commercial product differentiation** with the potential for price premiums
- Build **strong brand reputation** and foster **customer loyalty** within specific customer segments
- **Monetize farmer education** and **service** to third parties

Retailers / Distributors

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How Deloitte can support your company

Our experts are keen to help your company define and enact on your Regenerative Agriculture response.

01 Assessing the threat of Regenerative Agriculture on your business

Clarity on where Regenerative Agriculture will threaten your business in the future is a pre—requisite to act. Deloitte can help your company to *assess and quantify the threats,* e.g. through reduced market demand for existing products, missing product differentiation, challenges on continuity of input supplies and regulatory pressures (scope 3, biodiversity, water etc.)

02 Formulating a Regenerative Agriculture Framework

The different parts of your company need to be rallied behind the ambition of Regenerative Agriculture, the major levers and staging thereof as well as funding requirements and internal roles and responsibilities. Deloitte can take your company along our *holistic Regenerative Agriculture framework* to develop a plan and spur implementation, combining our Regenerative Agriculture expertise with your company specific circumstances.

03 Developing new growth models

Regenerative Agriculture opens new opportunities for companies to profit from in a still mostly unexplored terrain. Based on deep *sector expertise and innovation capabilities,* Deloitte can help translate regenerative agriculture trends into differentiating *value propositions and* fundamentally *new business models.*

04 Building Ecosystem collaboration

The agricultural transition required is too massive to achieve by a single company. Ecosystem collaborations across the value chain will be vital to accelerate the transition. Deloitte's existing *ecosystems in agriculture/food,* its deep *relationship with many players in the agriculture/food industry* and its *AgTech start-up platforms* enable Deloitte to quickly develop your ecosystem needs with you and connect your company to the right parties.

How Deloitte can support your company

Our proven Regenerative Agriculture framework helps companies to make major choices on the journey to Regenerative Agriculture.

Vision and ambition
- Define company's contribution towards scaling regenerative agriculture in the value chain
- Express environmental, financial, and socio-economic objectives of regenerative agriculture efforts
- Align regenerative agriculture ambition with wider ambitions of the organization

Prioritized raw materials & regions
- Identify potential impact of regenerative agriculture efforts for different raw material-region combinations
- Prioritize raw material—region combinations based on potential impact and ease of implementation (e.g., economics, control of value chain etc.)

KPIs
- Set the crops, raw materials in focus for regen ag
- Set detailed target variables (e.g. water reduction, soil health)
- Determine quantified targets are based on opportunity potential per ingredient—region combination

Methodology, Tools & enablement
- Choose sustainable farming methods to implement innovative best practices and methods to secure a regenerative system
- Develop plans for farm construction, crop rotation, bio alternative products, fertilization and crop monitoring
- Set up supporting tooling & ensure farmer enablement
- Develop plans for farmer information, education and support

Financial model
- Set needed financing options
- Select pay strategy (performance/ results/hybrid)

Commercial model
- Detail out commercial model (across the value chain)
- Insets and offsets
- Customer value proposition and communication
- Identify and solve for blockers

Monitoring
- Establish monitoring tactics (e.g. self-report or sensors)
- Build data infrastructure & monitoring dashboard
- Decide on monitoring protocol (vCS, RothC etc.)

Ecosystem approach
- Align internal ecosystem, engaging with departments from operations to communications
- Ensure alignment of wider ecosystem / value chain players to ensure sustainable impact
- Formalize agreements

Governance
- Implement governance mechanism and framework to enable agile and effective program management
- Follow-through feedback loop to adapt farmer practices

Get in Touch

With our experience and expertise, we are committed to helping you navigate the future with confidence.

To navigate the future with confidence, organisations need to make and act on the right choices: clear, timely and inspirational choices that deliver growth in a dynamic, disrupted world. Our global capability in sustainable food systems, and especially our Regenerative Agriculture research and client work allows you to tap into a global network of Food & Agri experts to accelerate your journey with deep industry insights.

Our partnerships with world class institutions and ecosystems across the food chain allow us to quickly identify systemic and science-backed solutions to your regenerative agriculture journey. And we offer a differentiating breadth of services has enabled us to support our clients on a full array of topics on their Regenerative Agriculture journey, from strategizing to implementation. Through commercial models, farmer enablement, monitoring and reporting to financing via carbon markets

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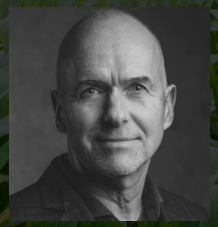

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Important notice

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