EARA
European Alliance for Regenerative Agriculture
Simon Kraemer (Policy Steward EARA)

DG AGRI TECHNICAL WORKSHOP ON SUSTAINABILITY

Sustainable Soil Management & Regenerative Ways of Farming

Introduction to the Praxis & Concept of Regenerative Agriculture

Agenda

1 Sustainability Crises in Agrifood Ecosystems

2 Evolution of Sustainability Narratives in Agriculture

3 The Praxis & Concept of Regenerative Agriculture

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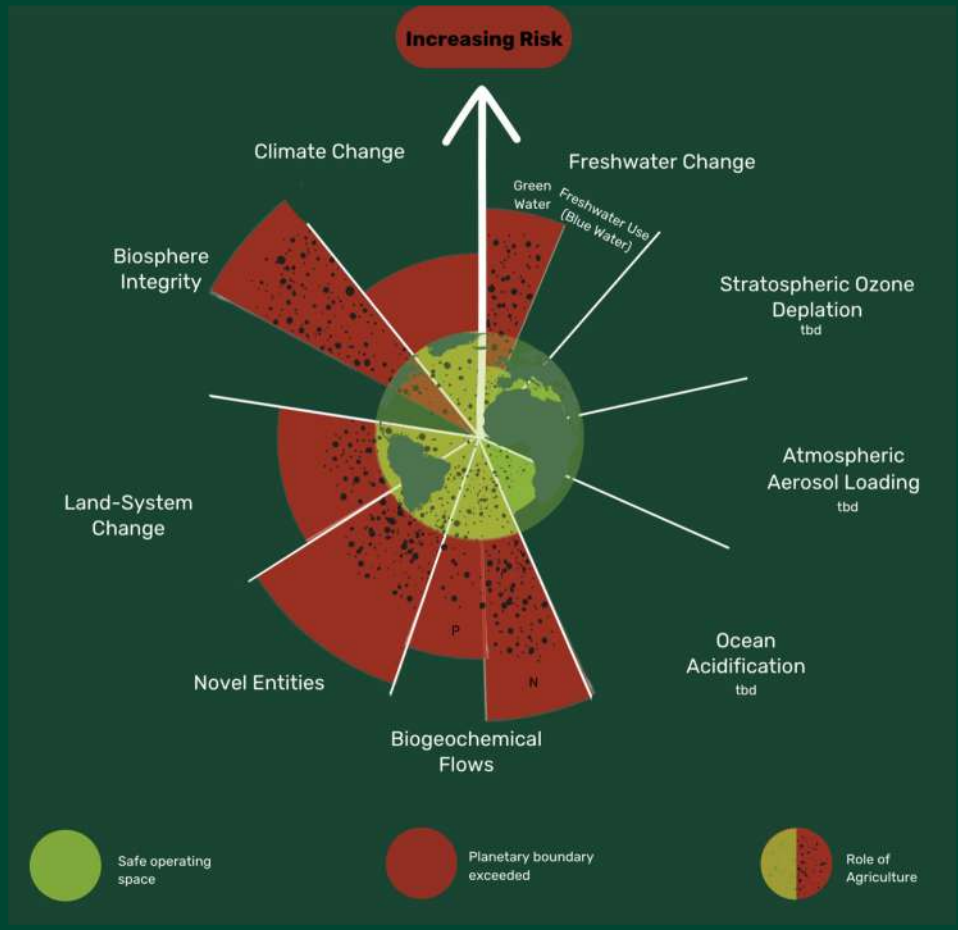
FROM A GLOBAL PERSPECTIVE, ACCORDING TO SCIENCE, THE AGRIFOOD SYSTEM...

- is the greatest driver of the degradation of our planetary health
- is the primary driver of biodiversity loss
- has severely impacted freshwater resources and their availability
- is the economic sector emitting the greatest amount of greenhouse gasses
- fails to supply sufficient and healthy food for all

Campbell et al. 2017; UNEP 2021; Wang- Erlandsson et al. 2022; Crippa et al. 2021; FAO 2023



Own figure based on Wang-Erlandsson et al. 2022; Persson et al. 2022; Steffen et al. 2015, Campbell et al. 2017; Kovac & Kravcik 2023.

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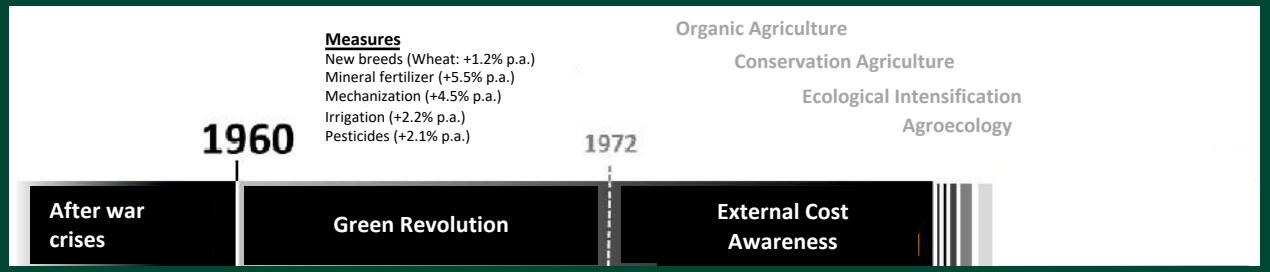
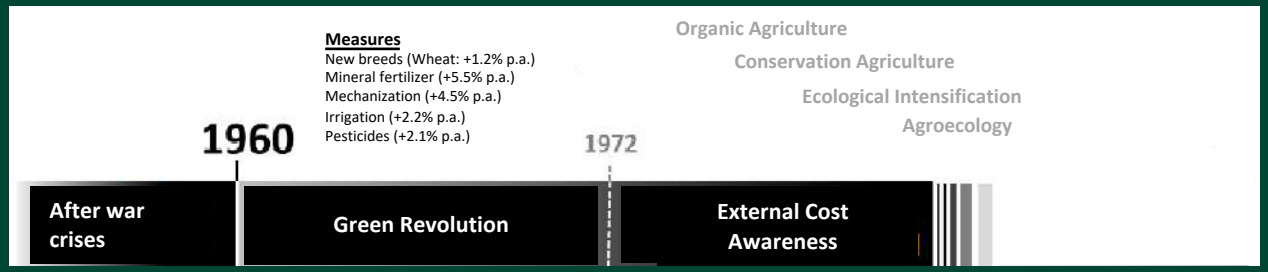
EVOLUTION OF SUSTAINABILITY NARRATIVES OF AGRICULTURAL POLICY DESIGN



Bodner 2021

EVOLUTION OF SUSTAINABILITY NARRATIVES OF AGRICULTURAL POLICY DESIGN



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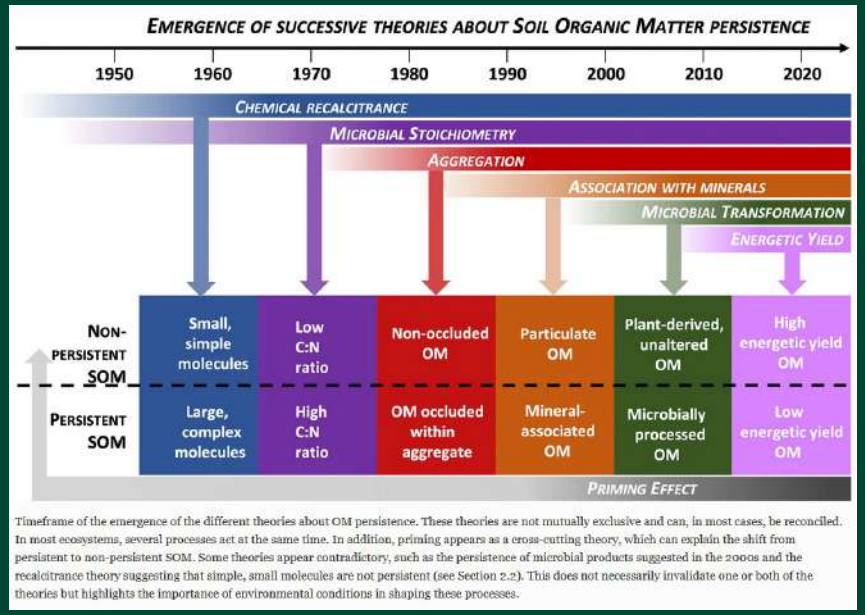
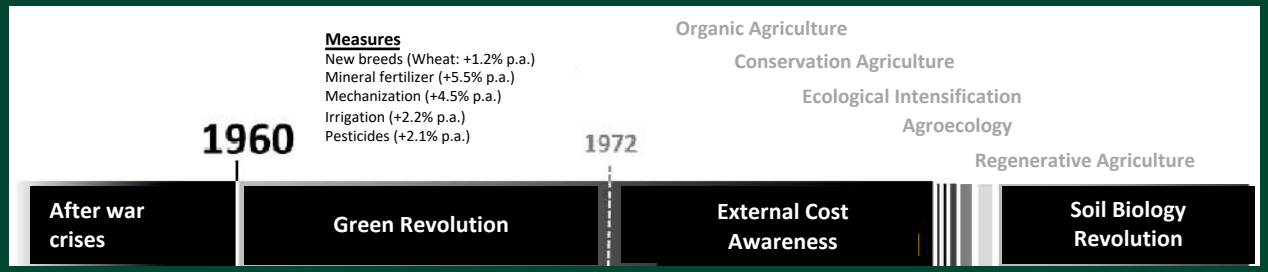


Timeframe of the emergence of the different theories about OM persistence. These theories are not mutually exclusive and can, in most cases, be reconciled. In most ecosystems, several processes act at the same time. In addition, priming appears as a cross-cutting theory, which can explain the shift from persistent to non-persistent SOM. Some theories appear contradictory, such as the persistence of microbial products suggested in the 2000s and the recalcitrance theory suggesting that simple, small molecules are not persistent (see Section 2.2). This does not necessarily invalidate one or both of the theories but highlights the importance of environmental conditions in shaping these processes.

Derrien et al. 2023

EVOLUTION OF SUSTAINABILITY NARRATIVES OF AGRICULTURAL POLICY DESIGN



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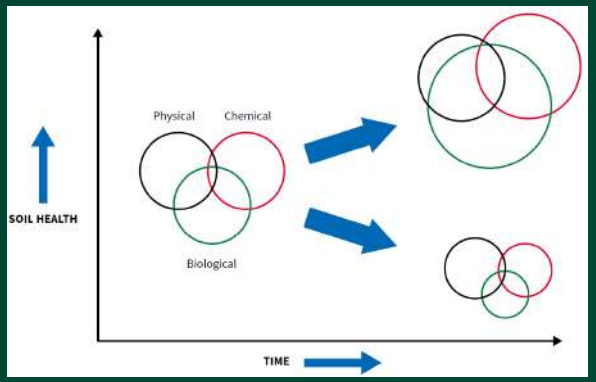
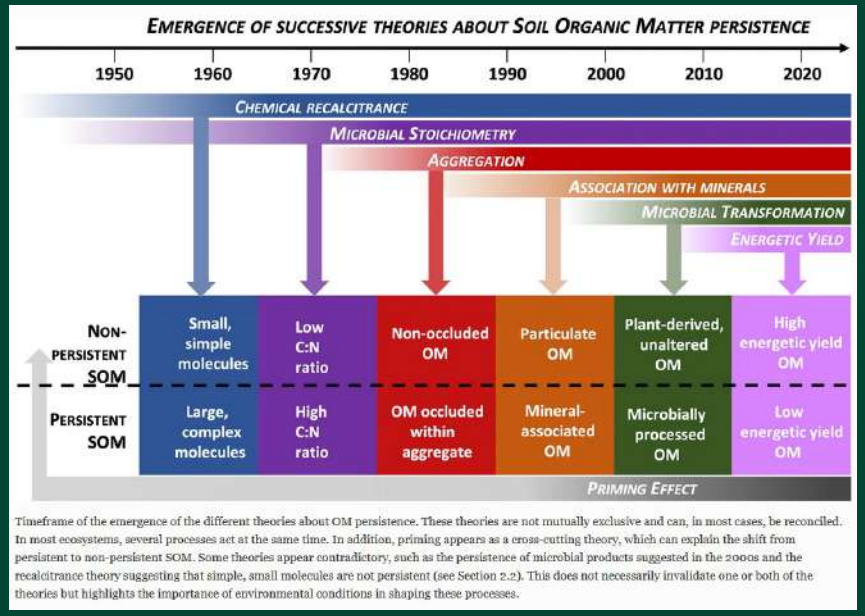


Gebremedhin et al. 2022



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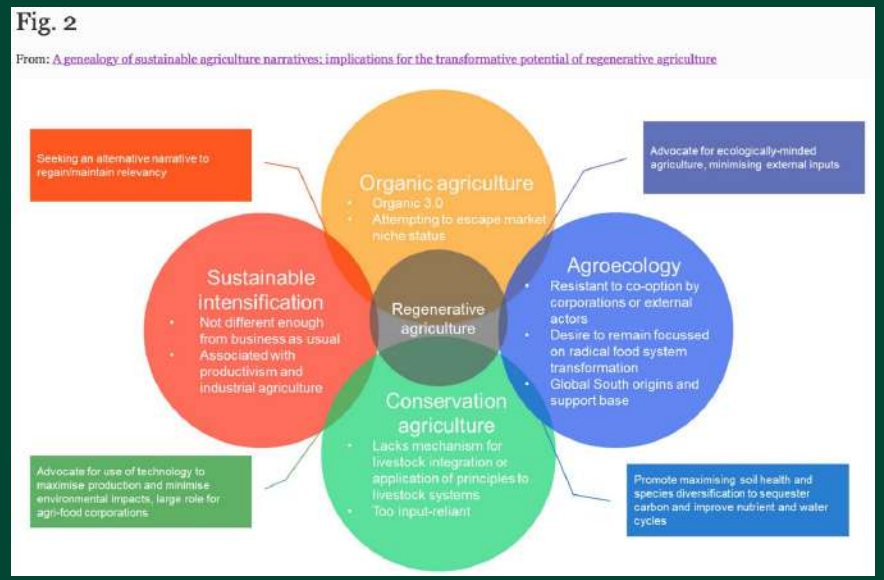
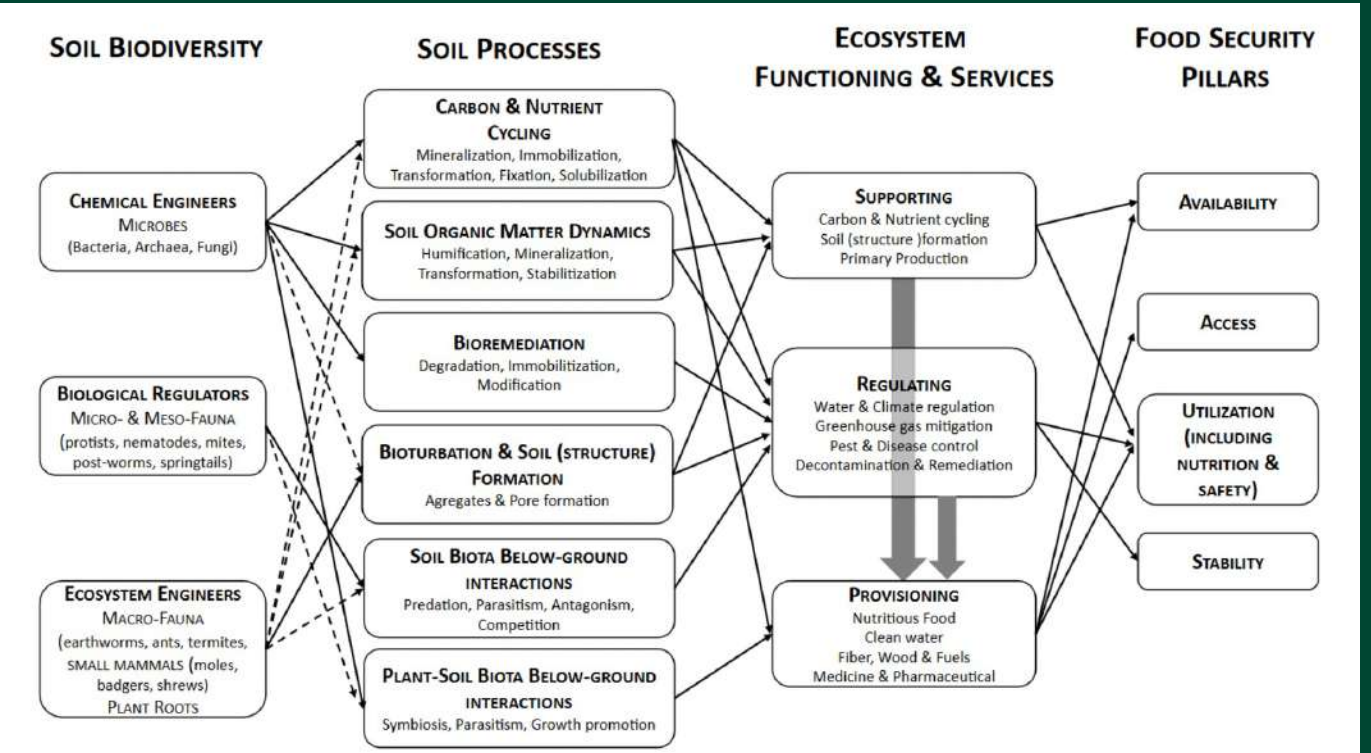
Derrien et al. 2023



Bless et al. 2023

SOIL BIODIVERSITY TO BRIDGE SUPPOSED FOOD SECURITY <-> GREEN DEAL TRADE-OFF & DEADLOCK



Relationships between soil biodiversity and food security pillars through soil processes and ecosystem functioning and services. Black arrows and black dashed arrows indicate, respectively, major and minor roles of functional groups on soil processes. Grey arrows indicate the relationships among supporting, regulating and provisioning ecosystem services[37].

Mujtar et al. 2019

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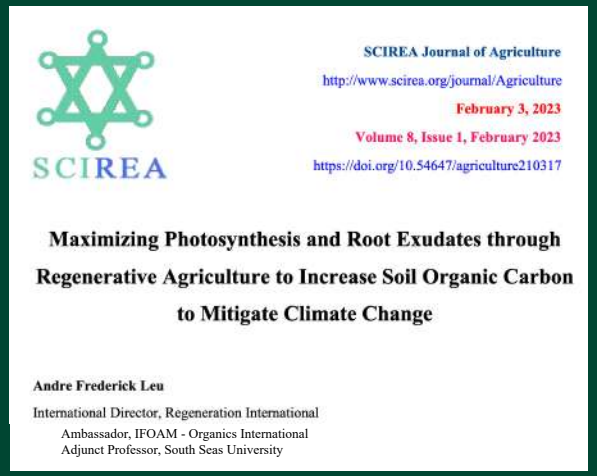
REGENERATIVE AGRICULTURE AS INNOVATIONAL LEAP IN AGRICULTURAL PRAXIS

"We propose a provisional definition of RA as an approach to farming that uses soil conservation as the entry point to regenerate and contribute to multiple ecosystem services."

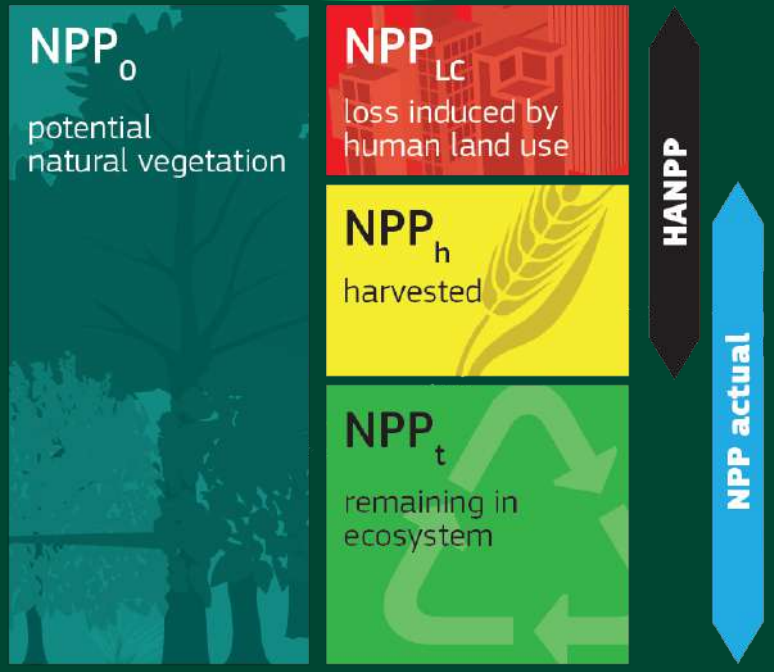
REGENERATIVE AGRICULTURE AS INNOVATIONAL LEAP IN AGRICULTURAL PRAXIS

"We propose a provisional definition of RA as an approach to farming that uses soil conservation as the entry point to regenerate and contribute to multiple ecosystem services."

*"The emphasis must be based on living soil and plant sciences to **maximize photosynthesis** to capture CO2 and maximize root exudations to feed the soil microbiome."*



PHOTOSYNTHESIS AS THE BASIS OF AGRICULTURE, CLIMATE & BIODIVERSITY



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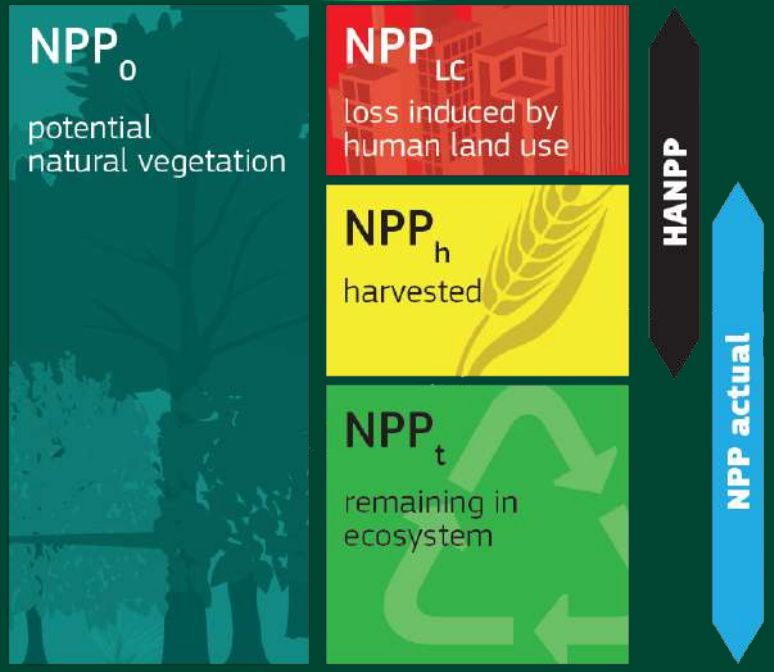


TABLE 1 Some important long-term global trends

Year	Population (million)	Energy use (GJ/capita)	Economic product (1990$/capita)	Life expectancy (years)	Global phytomass stock (Gt C)
5000 bp	20	<3	<100	20	>1,000
0	200	<5	500	<25	1,000
1000	300	<10	500	<30	900
1800	900	23	600	35	750
1900	1,600	27	1,200	40	660
2000	6,100	75	6,500	67	550

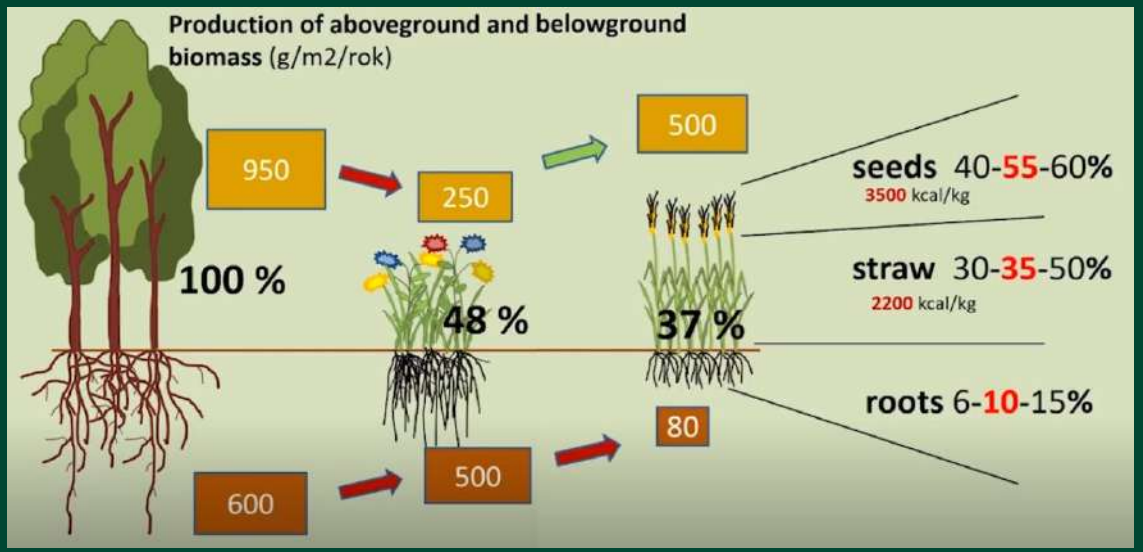
NOTE: bp = before present. All of these values (with the exception of post-1900 population, energy, and life expectancy) are approximations of the most likely values with substantial margins (generally >20 percent) of error. Population series are available in McEvedy and Jones (1978), Demeny (1990), and HYDE (2011). Average per capita energy use based on Smil (2008 and 2010). Economic product estimates based on Maddison (2007). Global phytomass stocks derived from Adams et al. (1990), Adams and Faure (1998), Matthews et al. (2000), Saugier, Roy, and Mooney (2001), Houghton (2003), and Houghton and Goetz (2008).

CARBON STOCK IN THE ATMOSPHERE

Era	Pg C
Pre-Agriculture	360
Pre-Industrial Revolution	560
Present	880

Total Emission From LUC & Agric.=575 Gt
Total Emission From Fossil Fuel =445 Gt
Zimov et al. (2006), WMO (2018), Lal

REGENERATIVE AGRICULTURE AS INNOVATIONAL LEAP IN AGRICULTURAL PRAXIS



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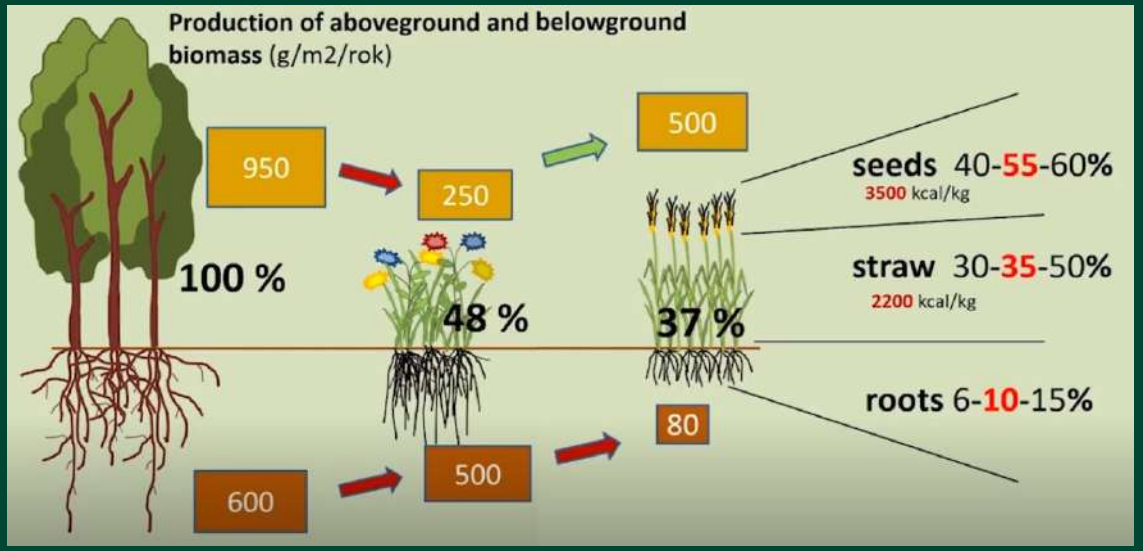

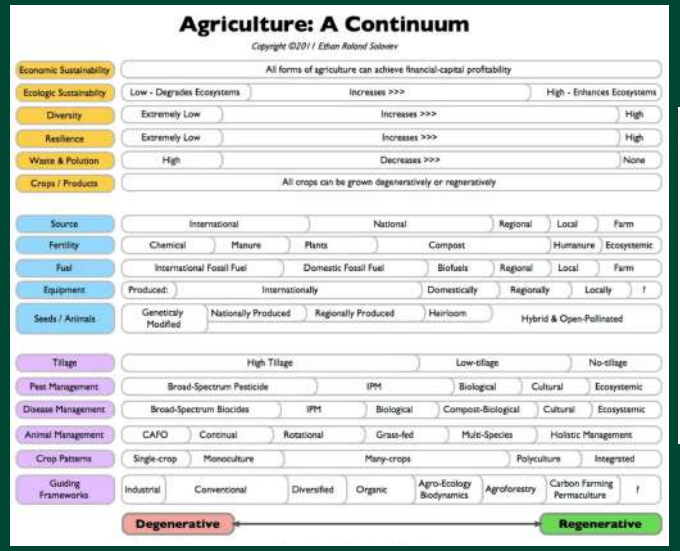

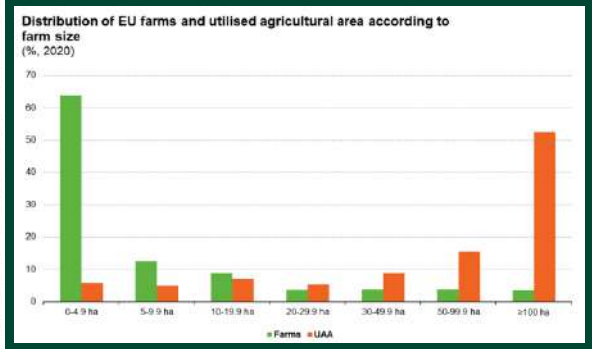

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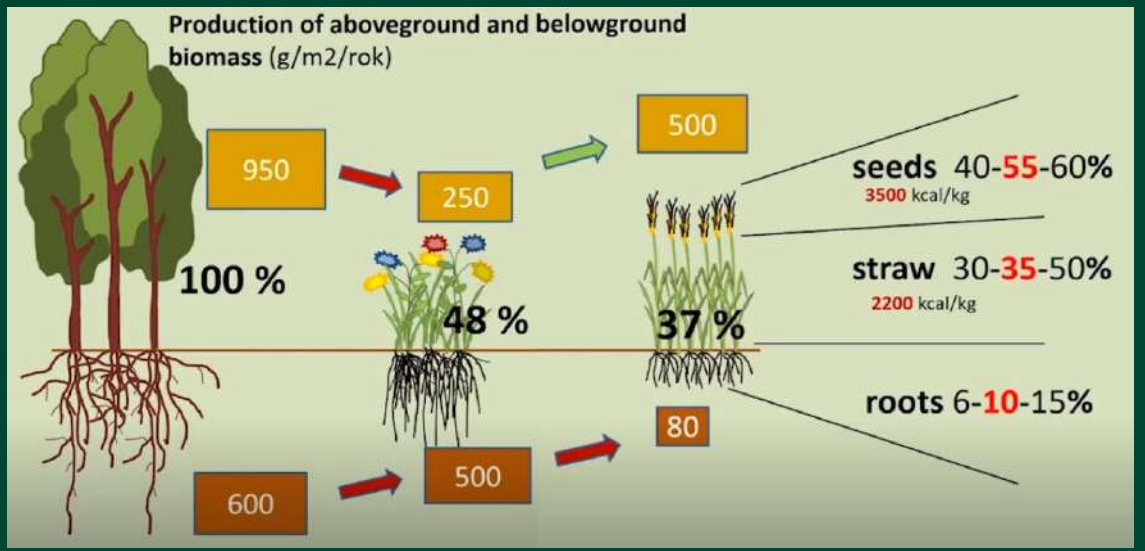
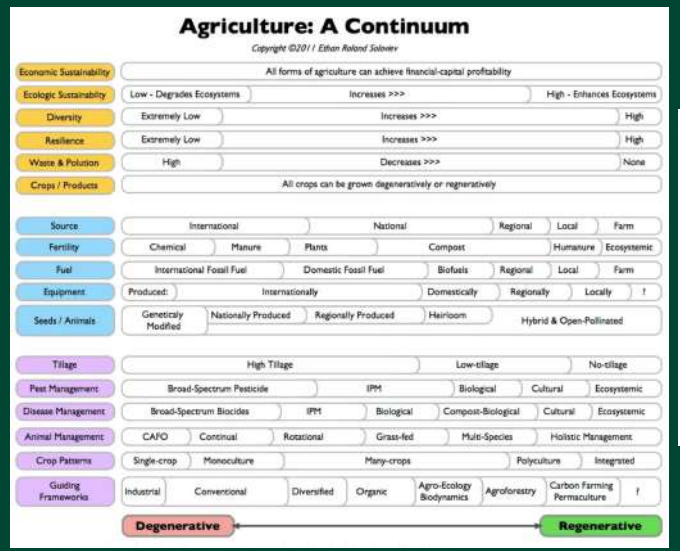
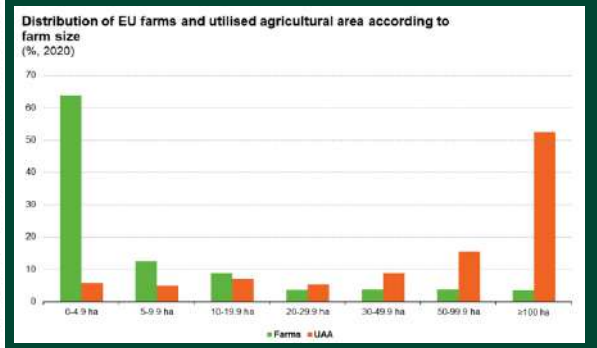
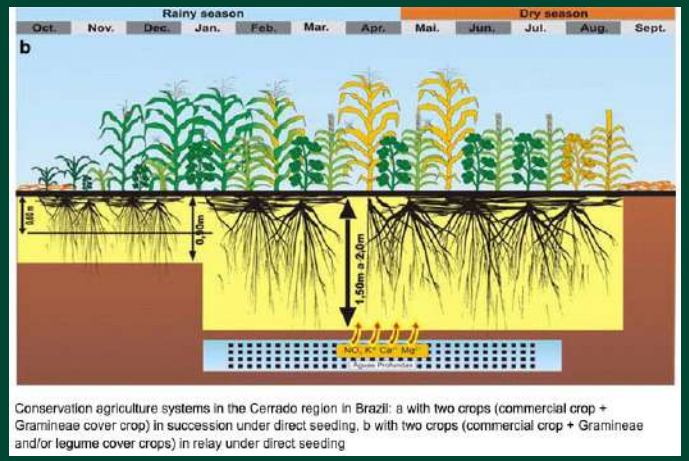
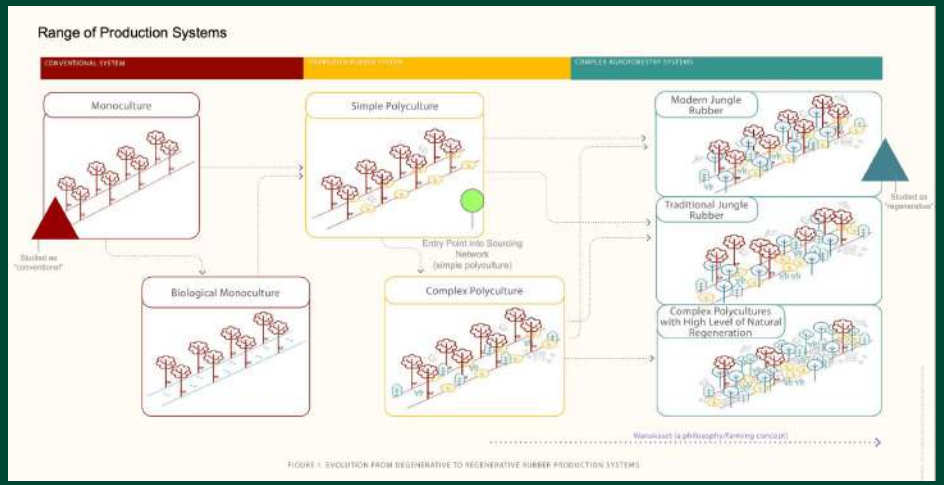




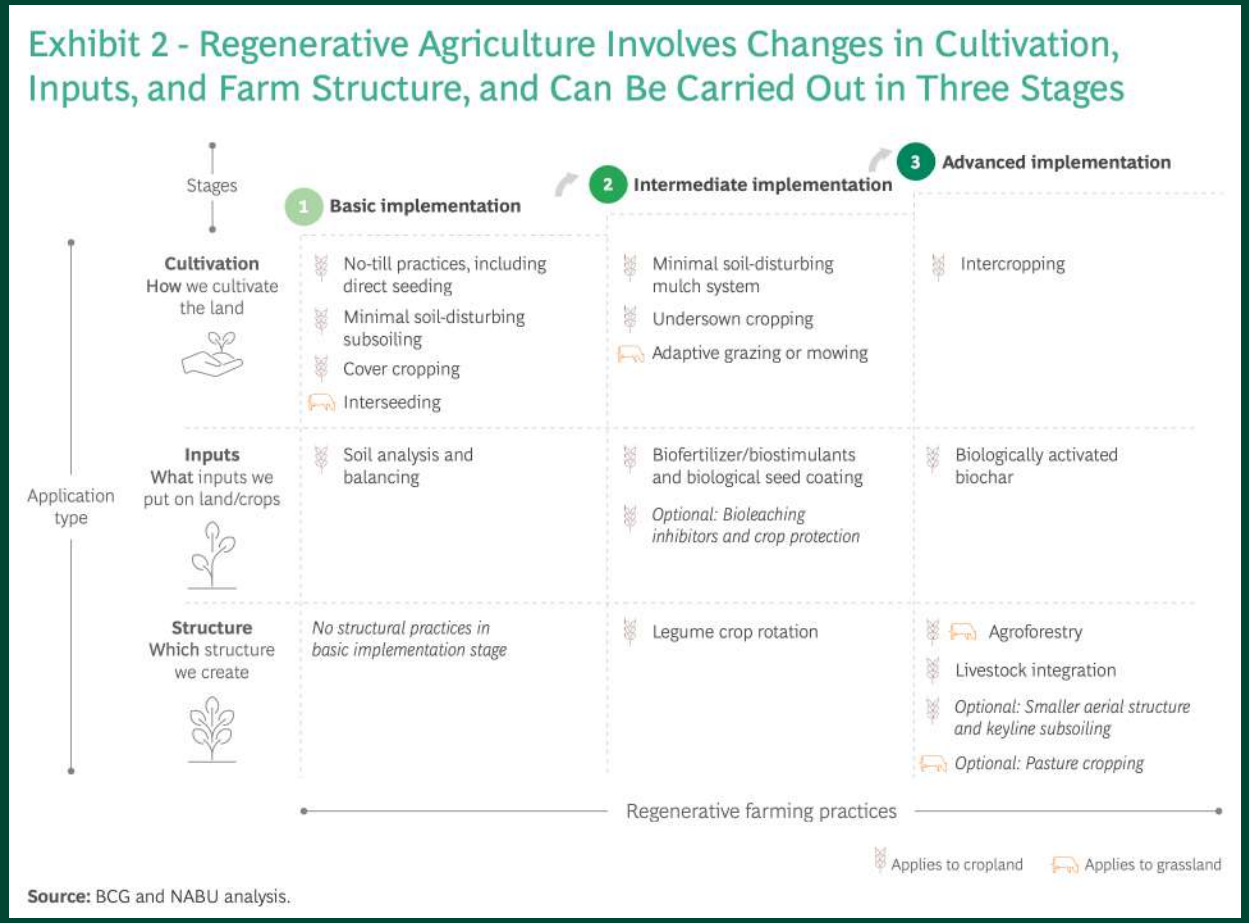




Conservation agriculture systems in the Cerrado region in Brazil: a with two crops (commercial crop + Gramineae cover crop) in succession under direct seeding, b with two crops (commercial crop + Gramineae and/or legume cover crops) in relay under direct seeding



TRANSITION TO REGENERATIVE AGRICULTURE



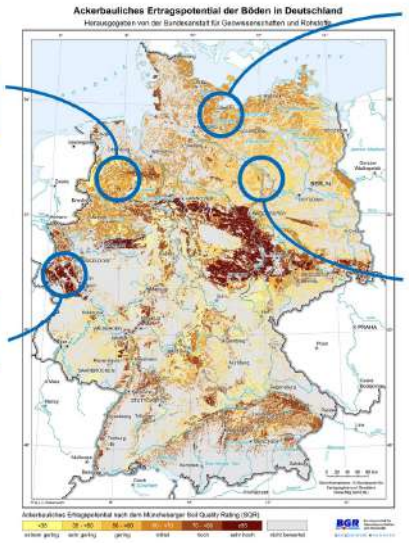
TRANSITION TO REGENERATIVE AGRICULTURE

Potato-Rotation

Clay/sand soil with sufficient precipitation

Sugarbeet-Rotation

High-yield soil, geographical proximity to sugar factories, high precipitation

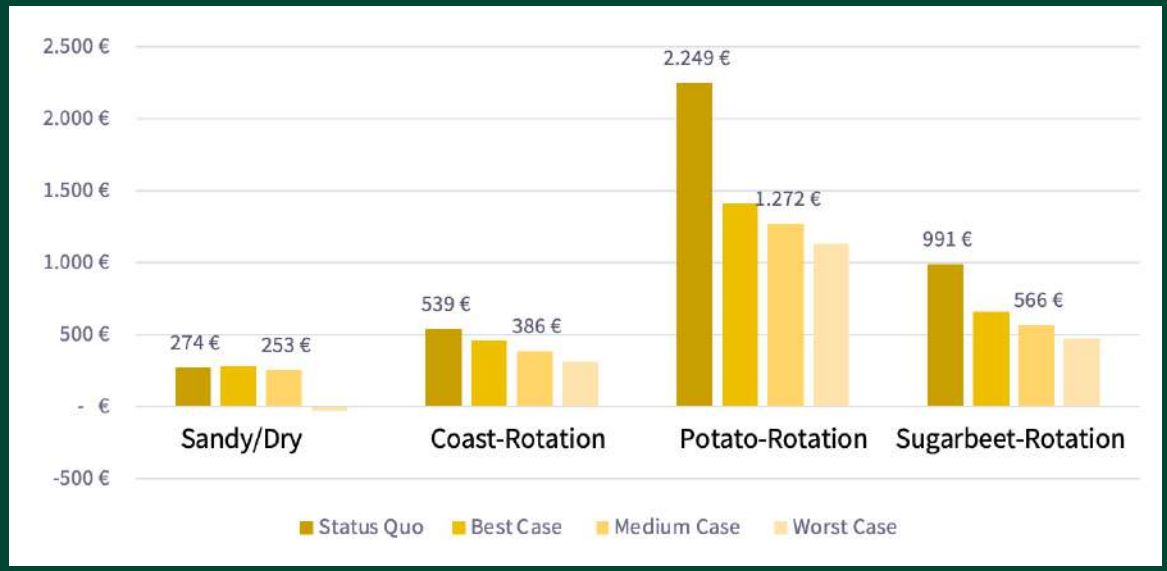


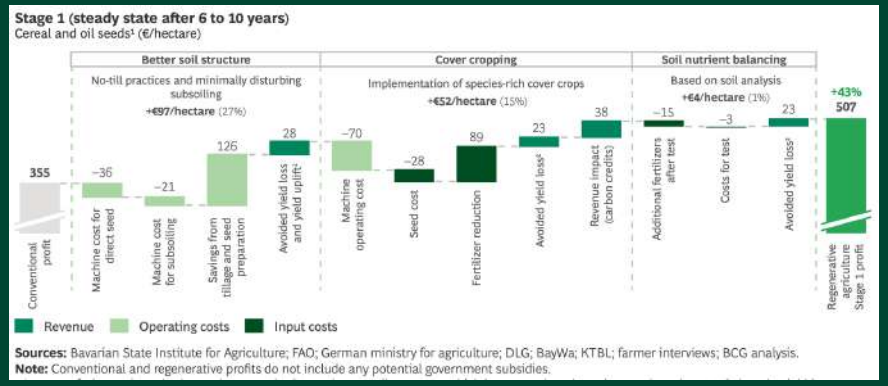
Coast-Rotation

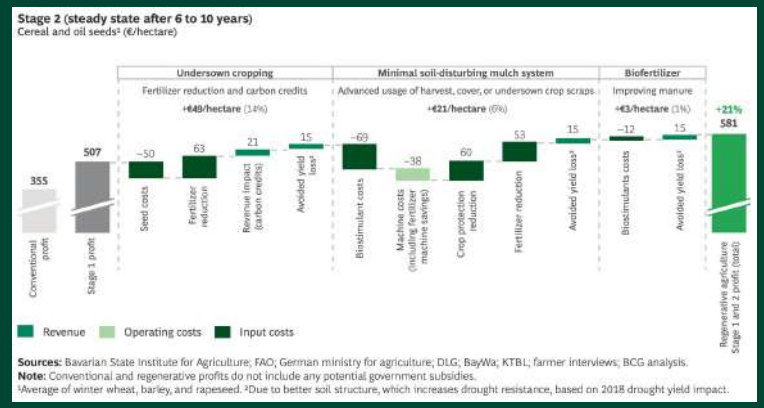
High-yield soils, high precipitiation

Sandy/Dry

Poor sandy soils with low precipitation, strong climate change impact, low yield potential







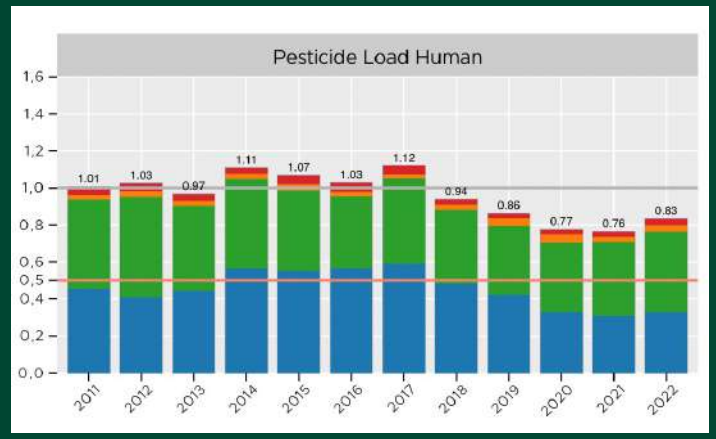
REGENERATIVE AGRICULTURE AS INNOVATIONAL LEAP IN AGRICULTURAL PRAXIS

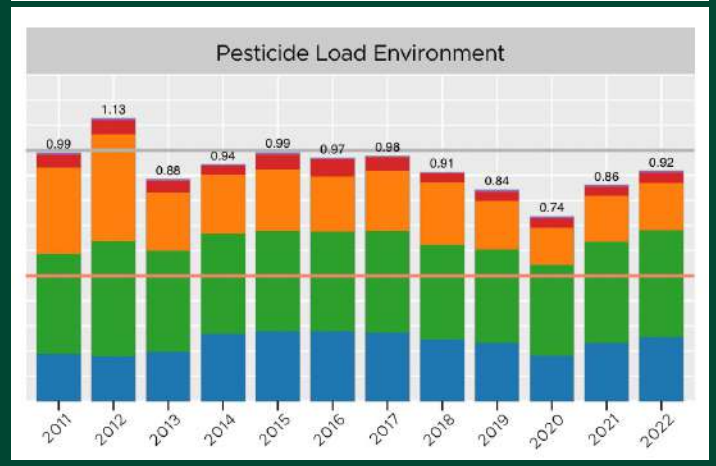
CA PRINCIPLES:

>> Continuous no or minimum mechanical soil disturbance

>> Permanent maintenance of a vegetative mulch cover on the soil surface

>> Species diversification





JKI 2023

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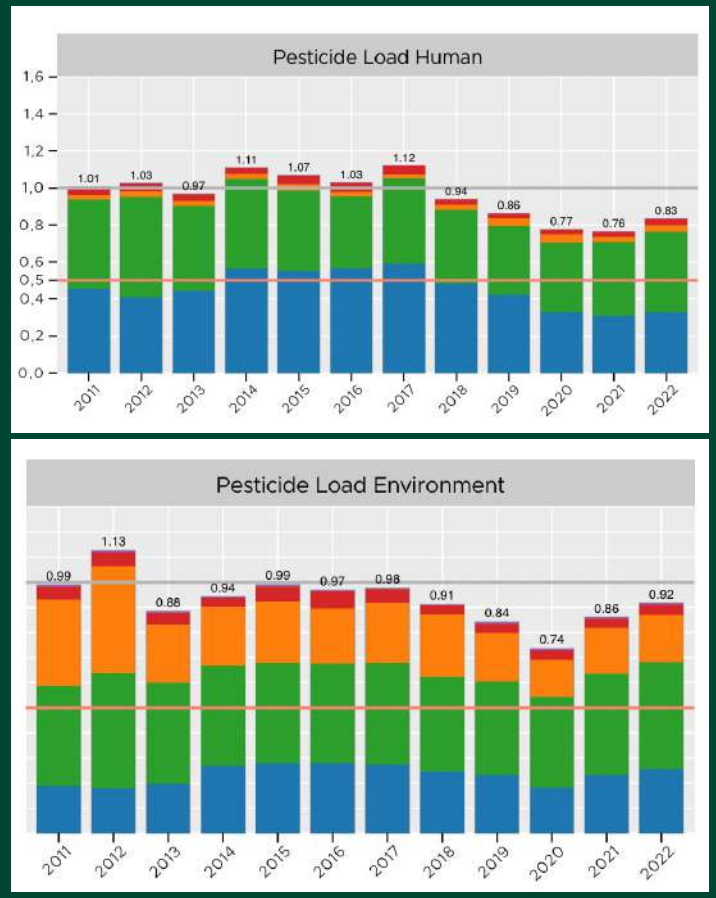

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Pesticide Reduction among German CA pioneers:

Amount: avg. -20%

Risk in PLI: -30 to -60%

NABU & GKB unpublished

REGENERATIVE AGRICULTURE AS INNOVATIONAL LEAP IN AGRICULTURAL PRAXIS

Crop	Weißhäutpl Avg. Yield Regen. Organic (dt/ha)	Austria Avg. Yield Conventional (dt/ha)
Corn	110	100
Sunflower	34	27
Spelt	35	45
Potatoes	320	300
Buckwheat	22	20
Pea/Triticale	55	40
Field Bean	40	40

On newly leased plots Corn yield of 40 dt/ha

+ 5% Humus -> Corn yield of 100 dt/ha

Fertilization via cover crop with 20 T Bokashi/ha

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On newly leased plots Corn yield of 40 dt/ha

+ 5% Humus -> Corn yield of 100 dt/ha

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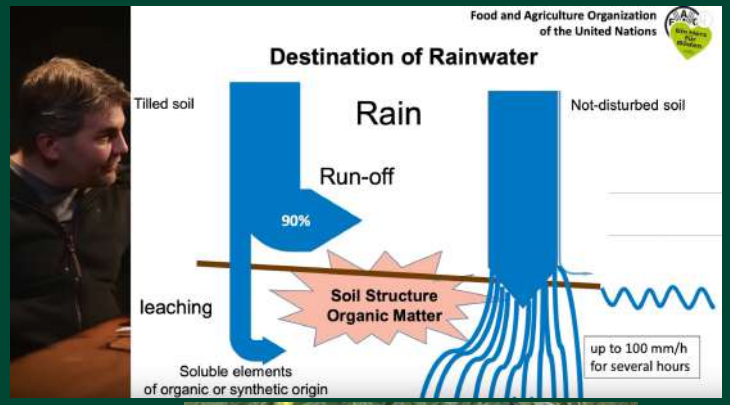

Started 2015: Very poor pedoclimatic context: 0.6%-1% SOM

2022: 1-4% SOM; 110% yield in comparison to conventional regional peers; 40-70% less Diesel, 10-40% less fertilizer, 20-70% less pesticides

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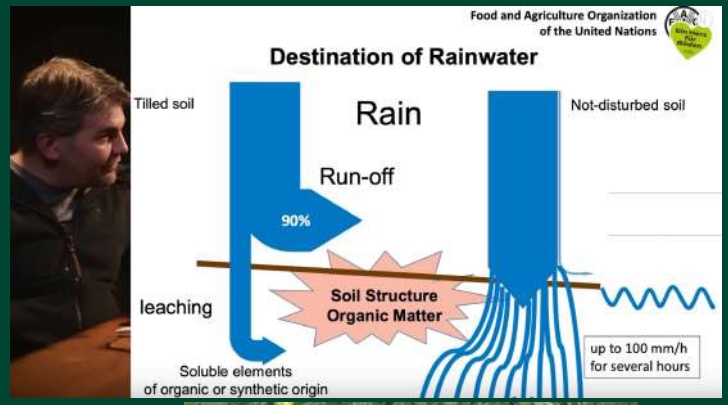

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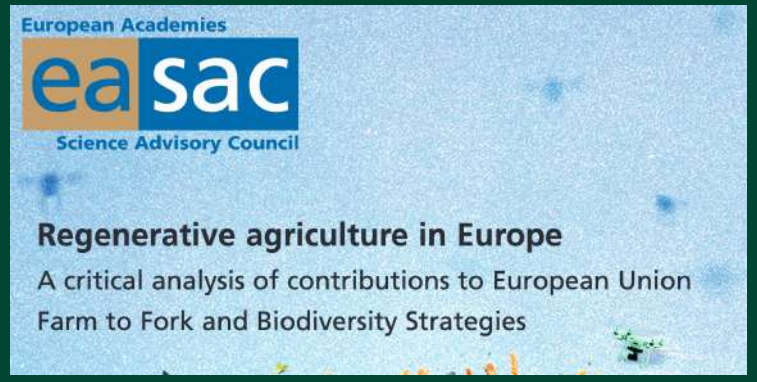
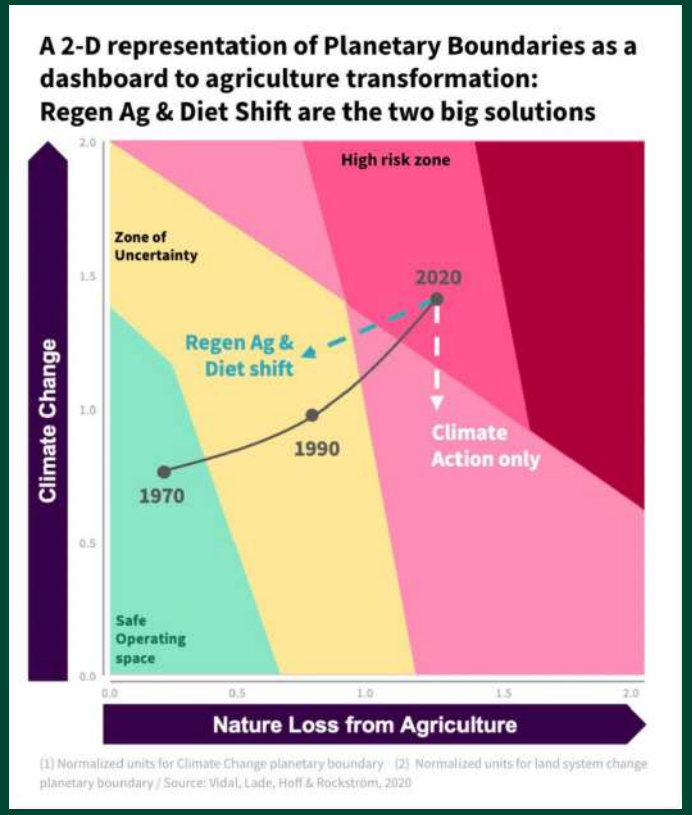
2022: 1-4% SOM; 110% yield in comparison to conventional regional peers; 40-70% less Diesel, 10-40% less fertilizer, 20-70% less pesticides

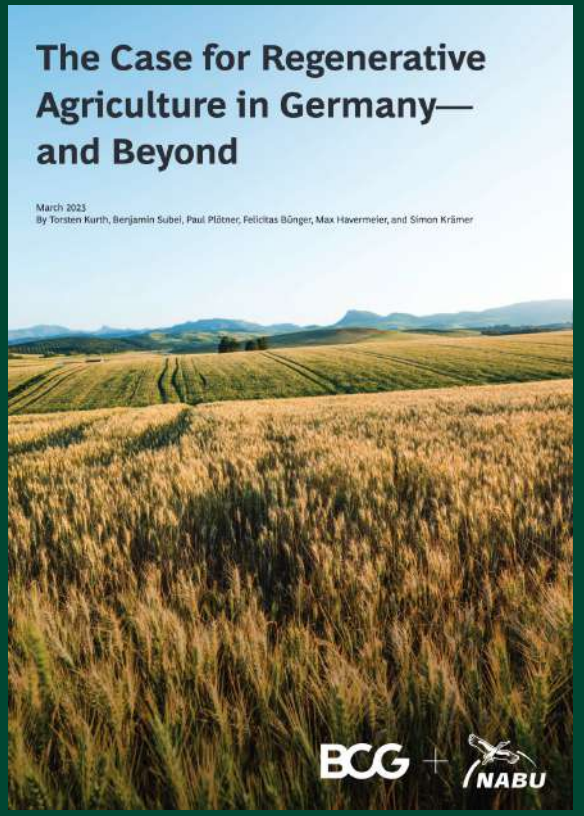
Started 2010: 1.5% SOM semiarid Mediterranean

2022: 5% SOM; 190% yield in comparison to conventional regional peers

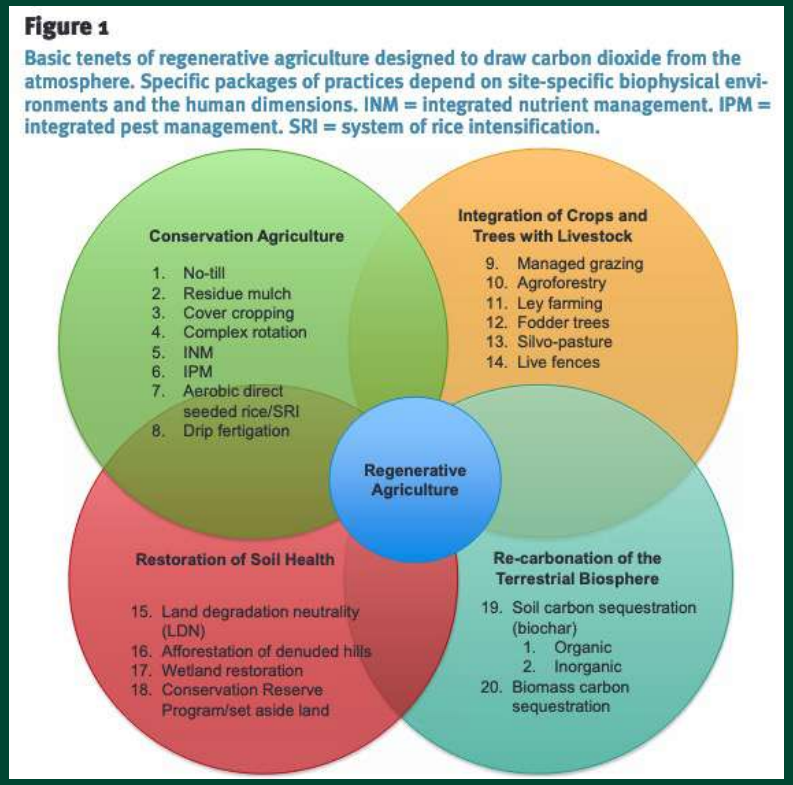
REGENERATIVE AGRICULTURE AS INNOVATIONAL LEAP IN AGRICULTURAL PRAXIS



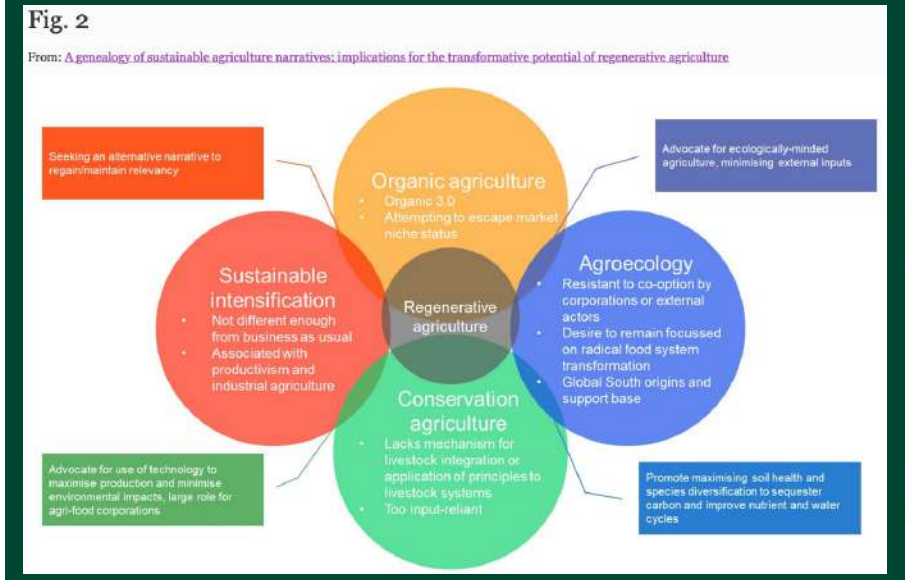




REGENERATIVE AGRICULTURE AS CONCEPT IN POLITICAL DISCOURSE



Lal 2020



Bless et al. 2023

REGENERATIVE AGRICULTURE'S RISKS OF GREENWASHING & -HUSHING

SustainableViews
Navigating ESG policy and regulation

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Agriculture, Spain

October 25, 2023

Bayer accused of greenwashing over 'regenerative agriculture' claims

By Philippa Nuttall

REGENERATION INTERNATIONAL

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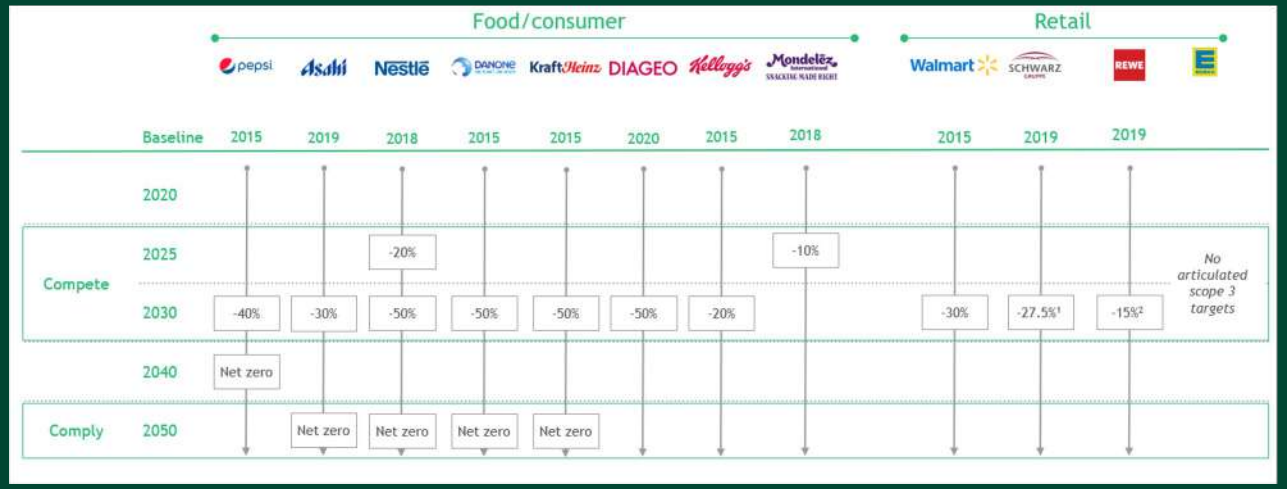
Degenerative Agriculture: Bayer/Monsanto's and Syngenta's Toxic Greenwashing Deception

06/29/2023 / by Dr. André Leu, D.Sc., BA Com., Grad Dip Ed. International Director, Regeneration International

"Regenerative agriculture and animal husbandry is the next and higher stage of organic food and farming, not only free from toxic pesticides, GMOs, chemical fertilizers, and factory farm production, and therefore good for human health; but also regenerative in terms of the health of the soil." Ronnie Cummins

Bayer/ Monsanto, Syngenta, and other members of the poison cartel are trying to greenwash their toxic industrial farming systems by hijacking Regenerative Agriculture.

REGENERATIVE AGRICULTURE'S RISKS OF GREENWASHING & -HUSHING



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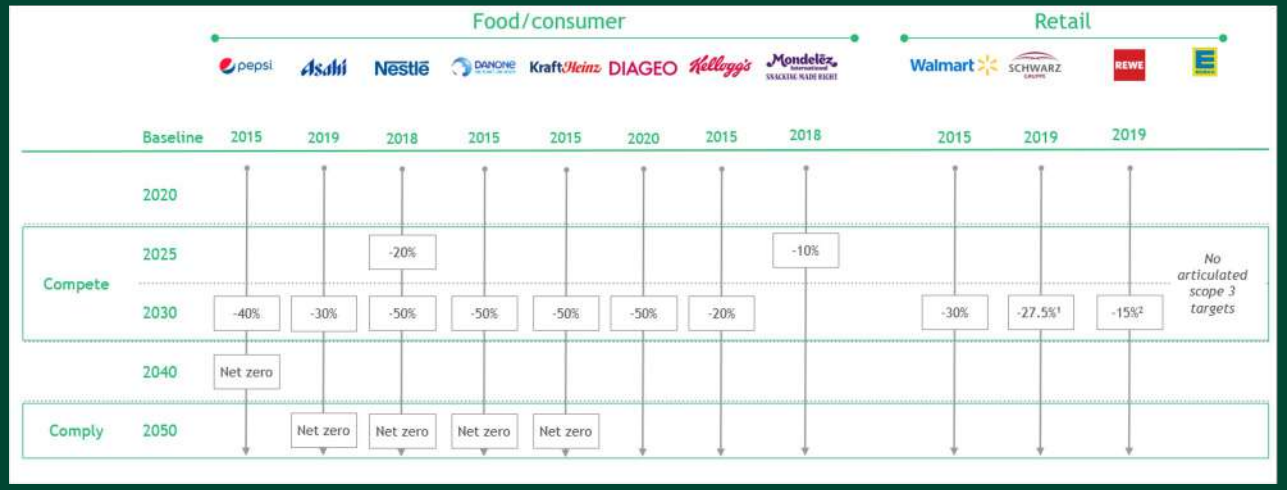


FAIRR
A COLLER INITIATIVE

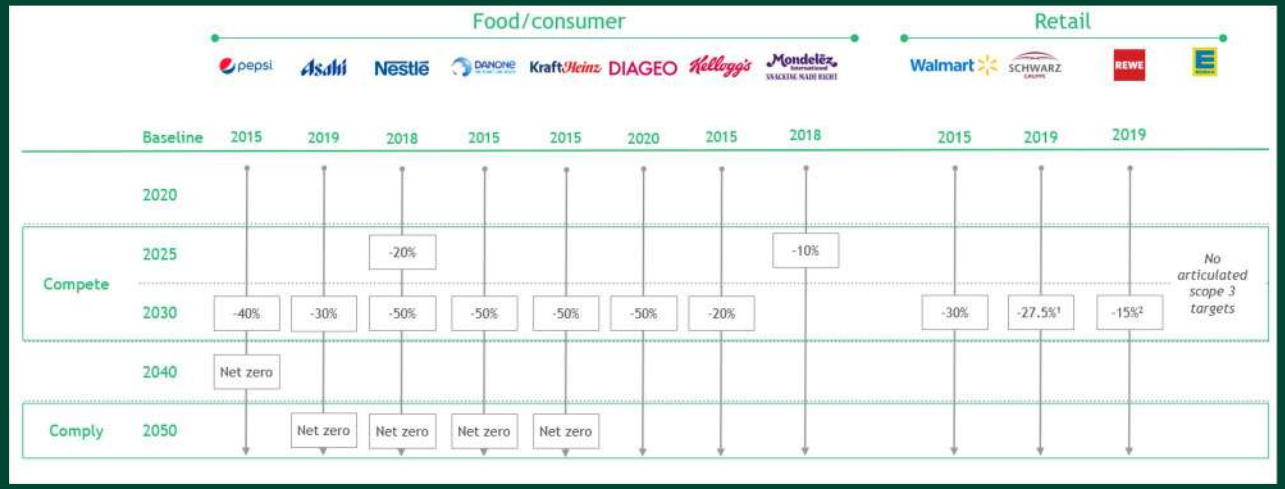
The Four Labours of Regenerative Agriculture

Paving the way towards meaningful commitments

Report Highlights

- 50/79 companies worth USD 3 trillion mention regenerative agriculture initiatives in their disclosures.
- Regenerative outcomes sought by companies are scattered with a preference for soil health and carbon.
- Only 36% (18/50) have quantified company-wide targets for regenerative agriculture.
- Just 16% (8/50) discuss metrics and data, with only four companies having established baselines to measure progress.
- Only 8% (4/50) have targets to financially support farmers to deploy regenerative practices.

REGENERATIVE AGRICULTURE'S RISKS OF GREENWASHING & -HUSHING



Emissions climbed in 2021 at most of Big Food companies assessed

	Total emissions (MtCO2e) 2020	Total emissions (MtCO2e) 2021	Change (%)
Danone	26	25	-5
General Mills	14	14	3
JBS	67	71	6
Kellogg	7	7	4
Kraft Heinz	26	45	72
Mars	28	29	6
Mondelez	25	25	3
Nestlé	120	119	-1
PepsiCo	59	63	6
Total	371	398	7

Note. Tyson Foods omitted due to lack of Scope 3 data.
Source: Company websites, sustainability reports, CDP disclosures and direct responses • Download image

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FAIRR
A COLLER INITIATIVE

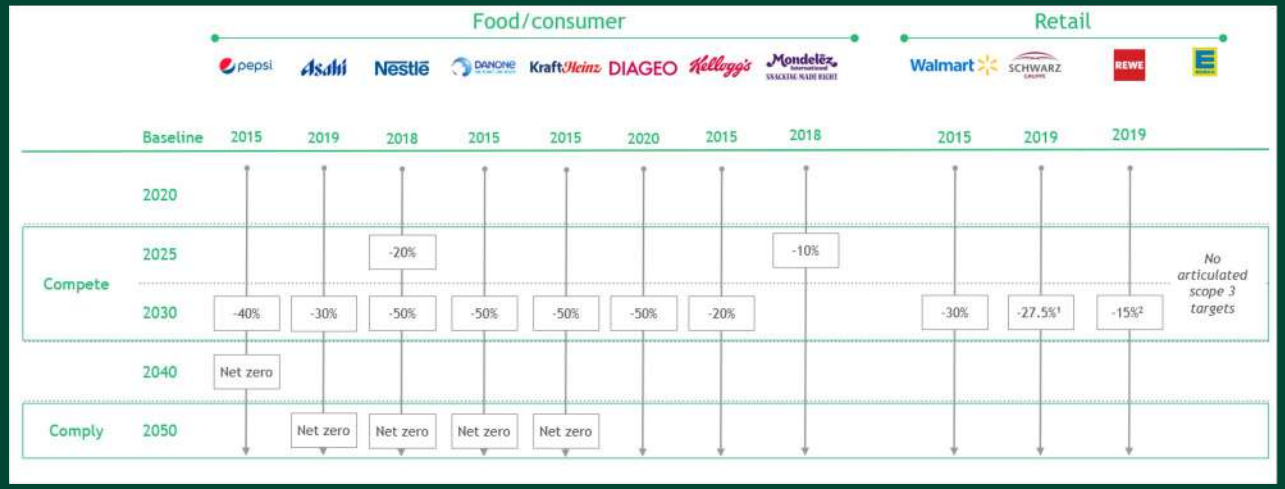
The Four Labours of Regenerative Agriculture

Paving the way towards meaningful commitments

Report Highlights

- 50/79 companies worth USD 3 trillion mention regenerative agriculture initiatives in their disclosures.
- Regenerative outcomes sought by companies are scattered with a preference for soil health and carbon.
- Only 36% (18/50) have quantified company-wide targets for regenerative agriculture.
- Just 16% (8/50) discuss metrics and data, with only four companies having established baselines to measure progress.
- Only 8% (4/50) have targets to financially support farmers to deploy regenerative practices.

REGENERATIVE AGRICULTURE'S RISKS OF GREENWASHING & -HUSHING



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JUST FOOD

In partnership with WWF France, Danone has developed its regenerative agriculture framework based on a continuous improvement approach in order to embark all agricultural producers, from less advanced to best in class. We are glad to be part of this journey.»

Arnaud Gauffier, Conservation Programs Director, WWF France

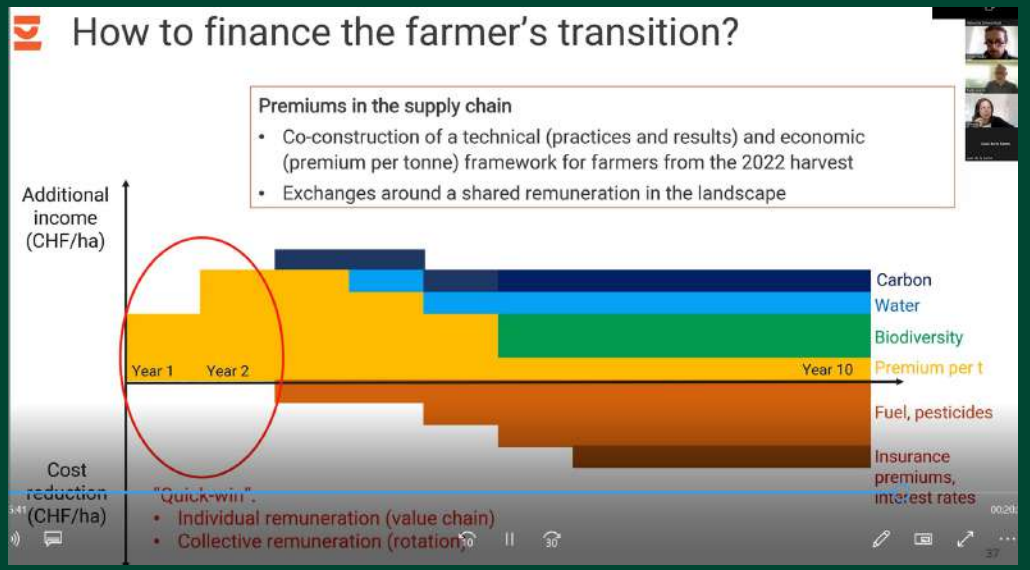
WWF France with Danone towards Regenerative Agriculture

Danone France is already leading the way, as it committed to source 100% of ingredients produced in the country from regenerative agriculture by 2025.

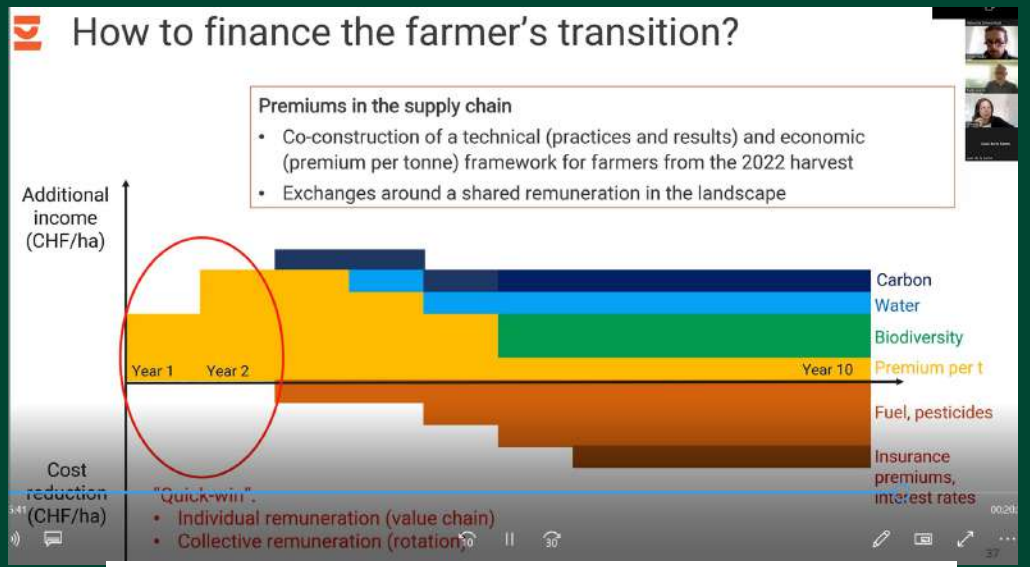
Nestlé commits to £1 billion in regenerative agriculture

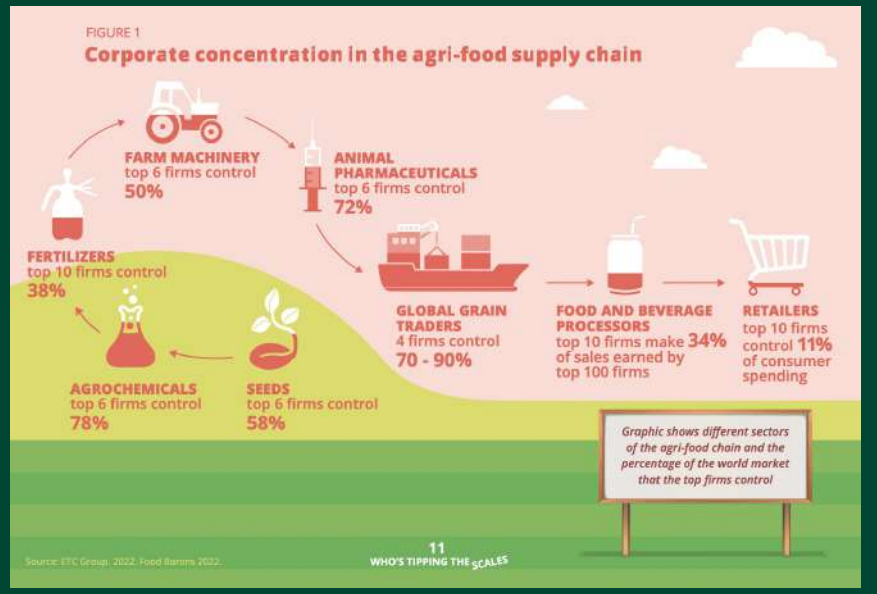
Will source 14 million tons of "green" ingredients to support the supply chain

REGENERATIVE AGRICULTURE'S RISKS OF GREENWASHING & -HUSHING



REGENERATIVE AGRICULTURE'S RISKS OF GREENWASHING & -HUSHING





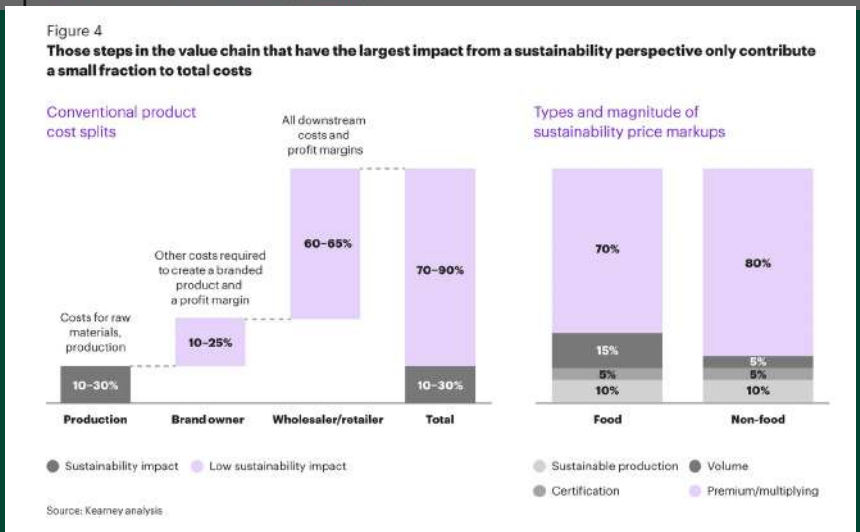
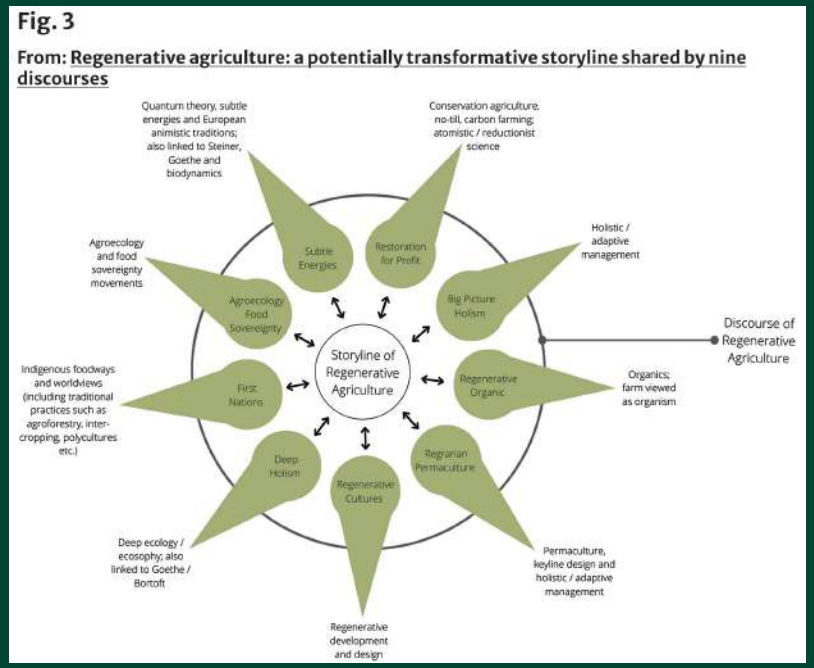
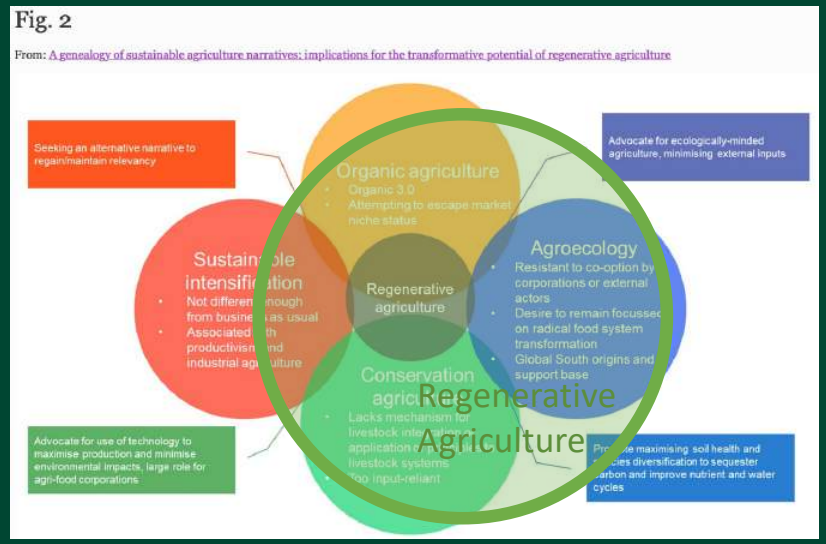


Figure 12: Farmers share of gross value added in German food supply chain (share of agribusiness (upstream supply chain from farmers) still included) (figure by author based on Thünen Institut)[245]

REGENERATIVE AGRICULTURE AS SOCIAL COHESION FOSTERING CONCEPT



Gordon et al. 2023

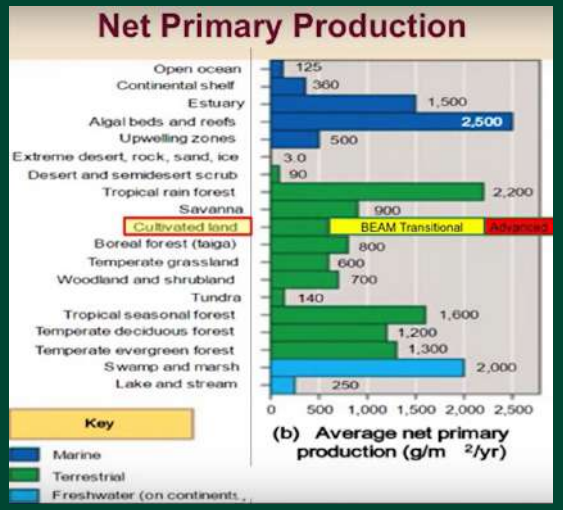


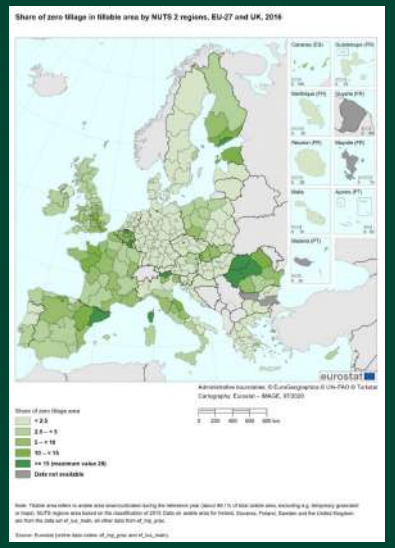
Own figure based on Bless et al. 2023

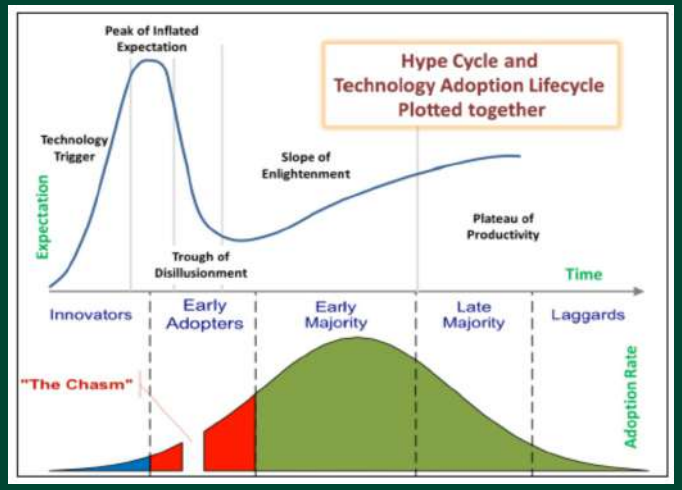
Biodiversity	Water	Water	Carbon	Productivity	Crop Health	Nutritional Quality	Economic Health
20 x	**33 °C**	**275 %**	**300 %**	**46 %**	**1.000 %**	**45 %**	**70 %**
more birds	less surface temperature	improvement of the soils' water functions	better CO2e balance	increase of forage production on pastures	less 'pest' abundance	higher nutrient density	more on-farm profit

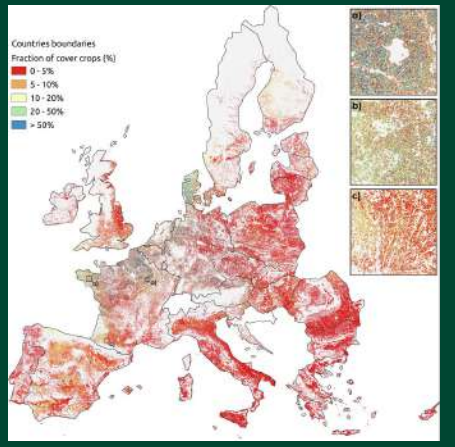
Own figure based on Søby 2020; Schwarzer 2023; Lal et al. 2020; Polyfarming 2022; Johnson et al. 2022; Montgomery et al. 2022; Montgomery et al. 2022; LaCanne et al. 2018.

TOWARDS PHOTOSYNTHESIS PERFORMANCE-BASED PAYMENTS IN A CAP-POST 2027









Fendrich et al. 2023

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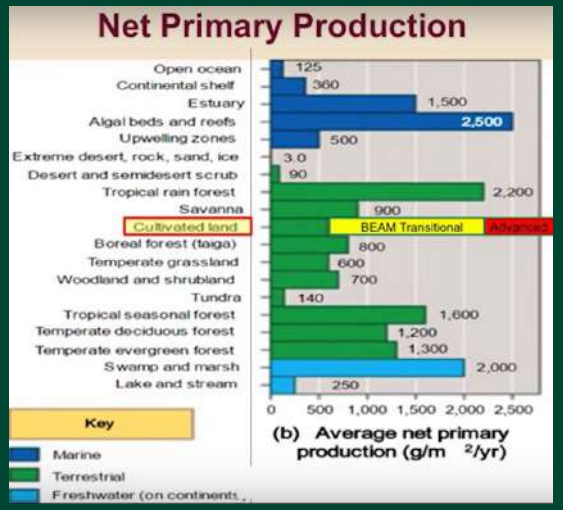
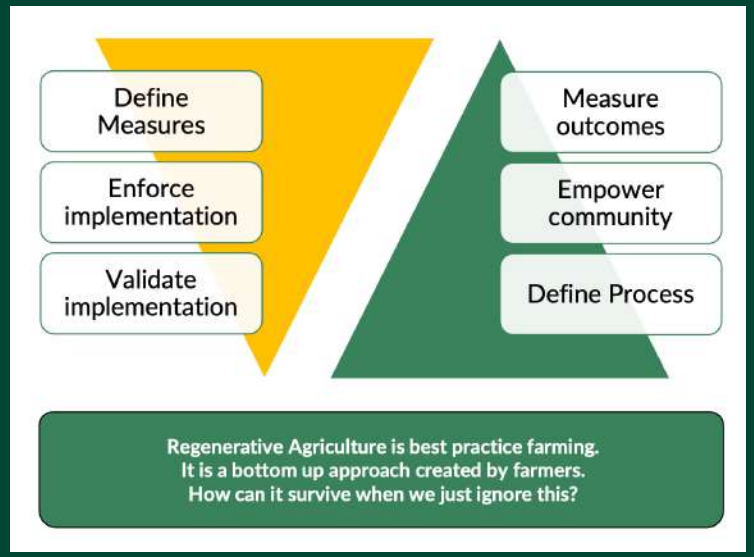
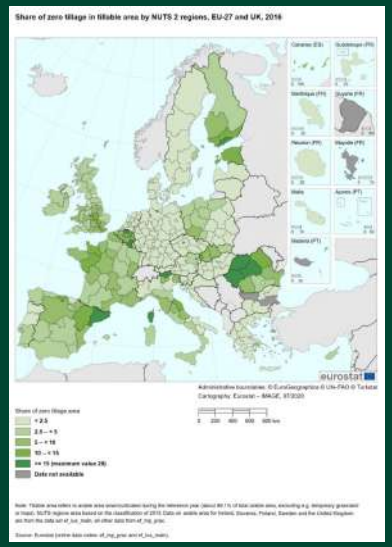
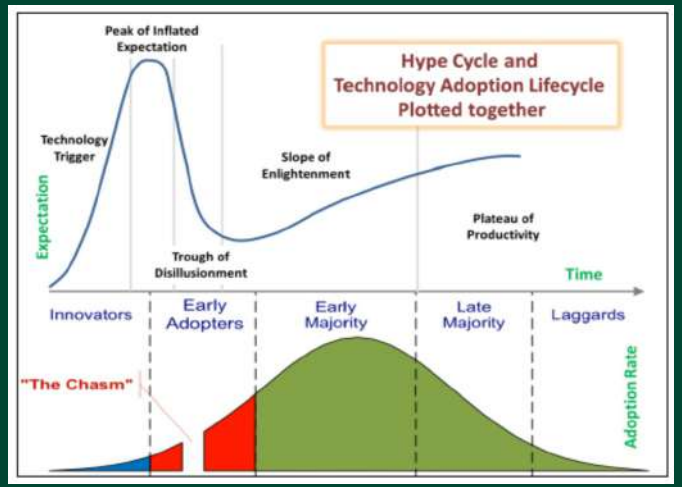
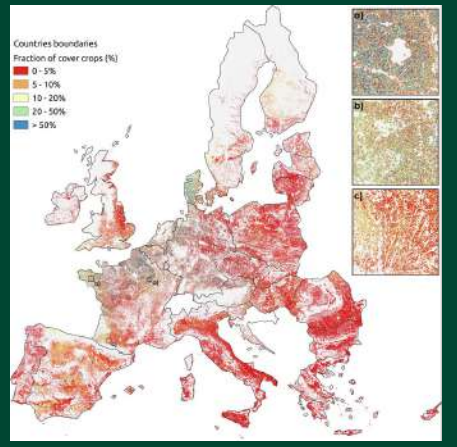




Fröhlich 2023







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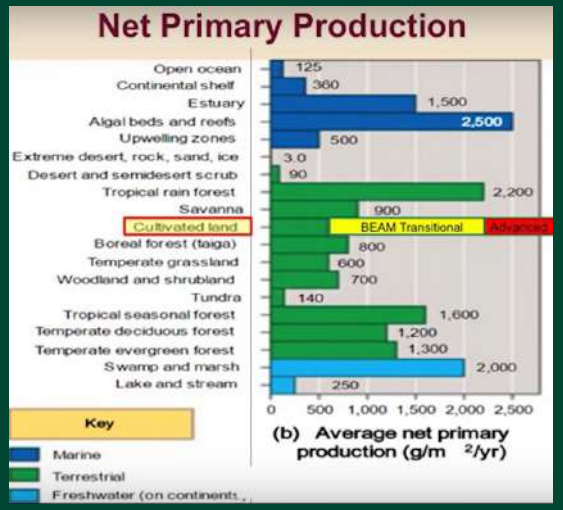

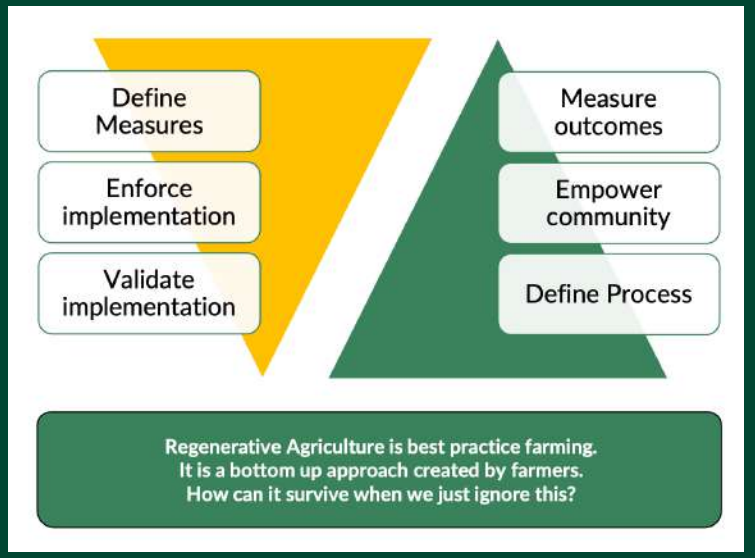

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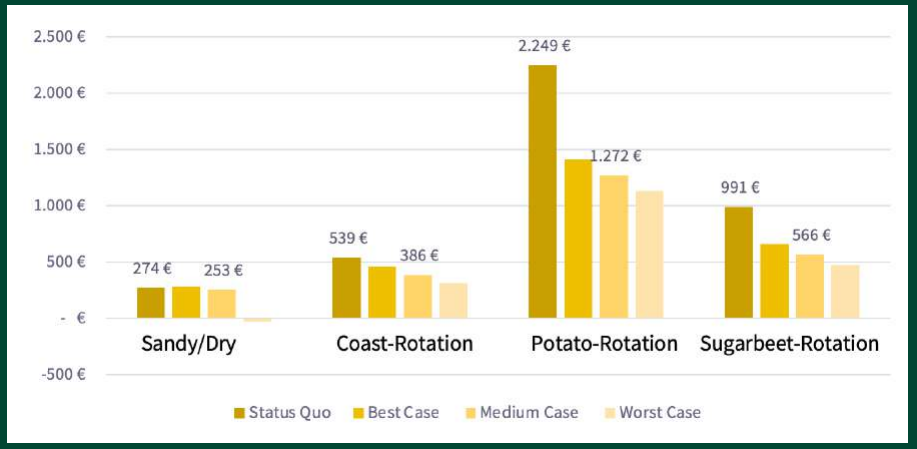
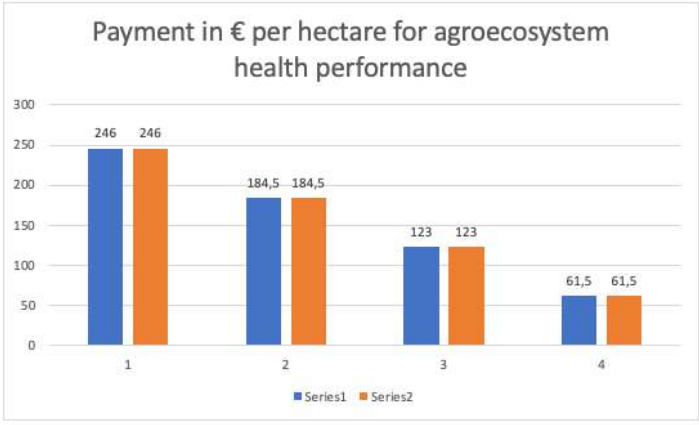


Per hectare progressive structural change / equity adjustment

Bonus if farm is < 5 hectares	*2
Bonus if farm is < 15 hectares	*1,5
Bonus if farm is < 30 hectares	*1,15
Bonus if farm is < 50 hectares	*1,05
Discount if farm is > 150 hectares	*-1,05
Discount if farm is > 200 hectares	*-1,15
Discount if farm is > 300 hectares	*-1,5
Discount if farm is > 450 hectares	*-2

Cap at 100.000€ (to be determined politically)



Thank you & Next steps

Towards a farmer and agroecosystem health centered CAP