The Power of Protein Diversification for Future-Fit Farming

A holistic food system

QUEEN'S UNIVERSITY BELFAST | IGFS THE INSTITUTE FOR GLOBAL FOOD SECURITY

grow

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UK and Ireland, GROW

What is GROW?

GROW is a farmer-centric capacity building project that provides advice and tools to farmers to transition towards **sustainable farming** practices.

For whom?

Designed for key actors in the **primary production** phase of the food supply chain. Farmers, but also SMEs, startups, industry, public/private organisations, among others, in Portugal, Sweden, UK, Germany and Poland.

Why GROW?

We provide essential tools, resources, and networking opportunities to help farmers transition to more sustainable practices and build a resilient food system.

Innovation

GROW drives innovation in sustainable agriculture.

Knowledge sharing

GROW facilitates the exchange of knowledge and best practices.

Networking

GROW connects farmers with experts and other stakeholders.

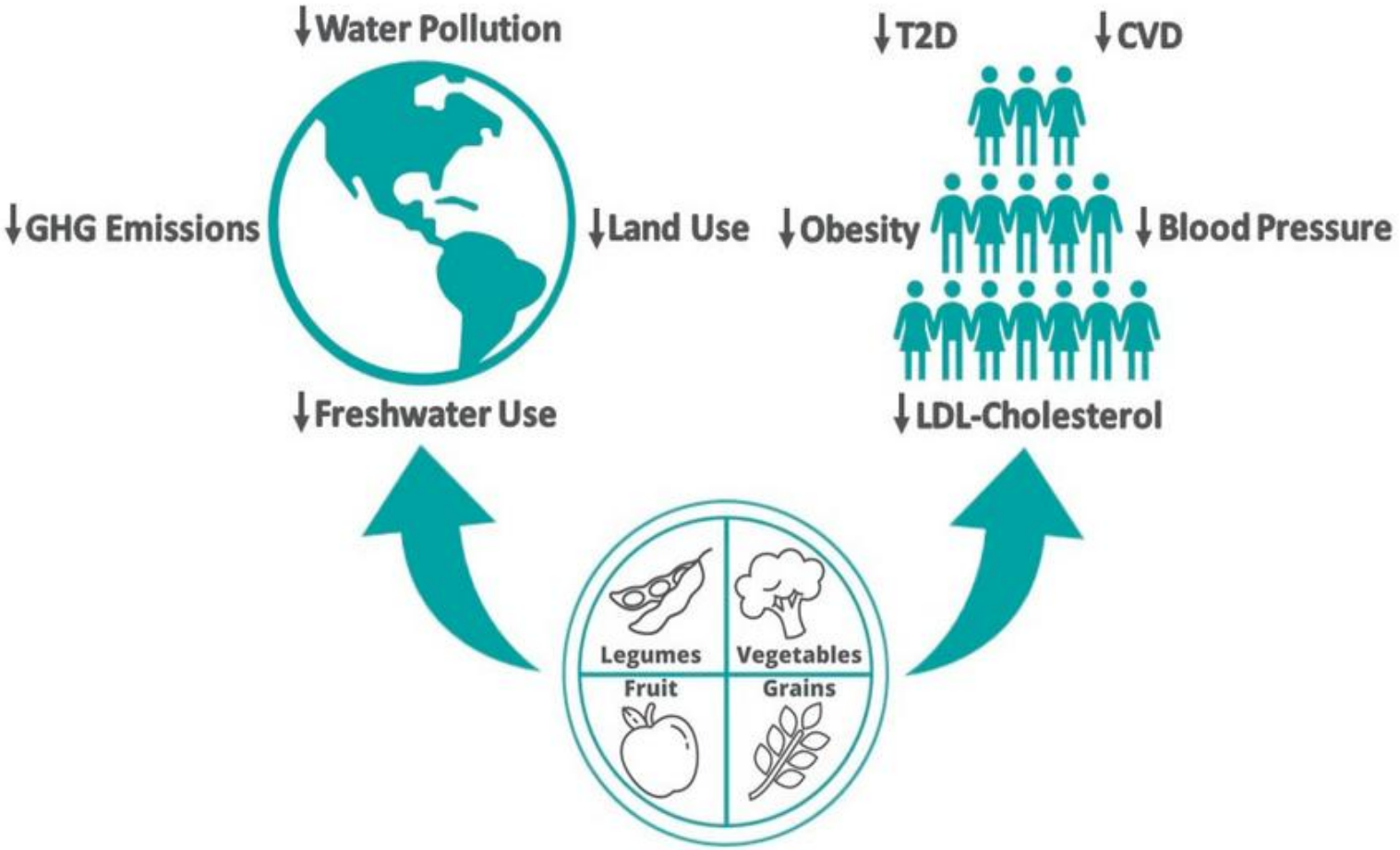
GROW is a capacity building initiative empowering farmers across Europe to embrace sustainable agriculture

Institute of Animal Reproduction and Food Research Polish Academy of Sciences in Olsztyn

A Diet for the planet

A Diet balanced for planetary and human health

- 2 Billion people cannot afford a healthy diet
- 48% of the global population do not consume enough calories but 43% of adults are overweight
- 1 in 5 deaths associated with poor diet globally



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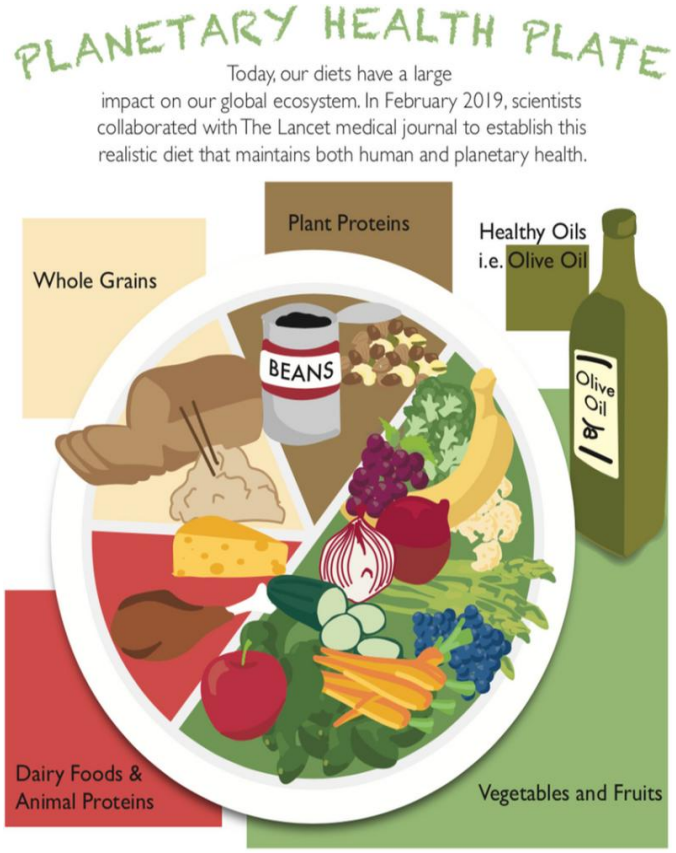
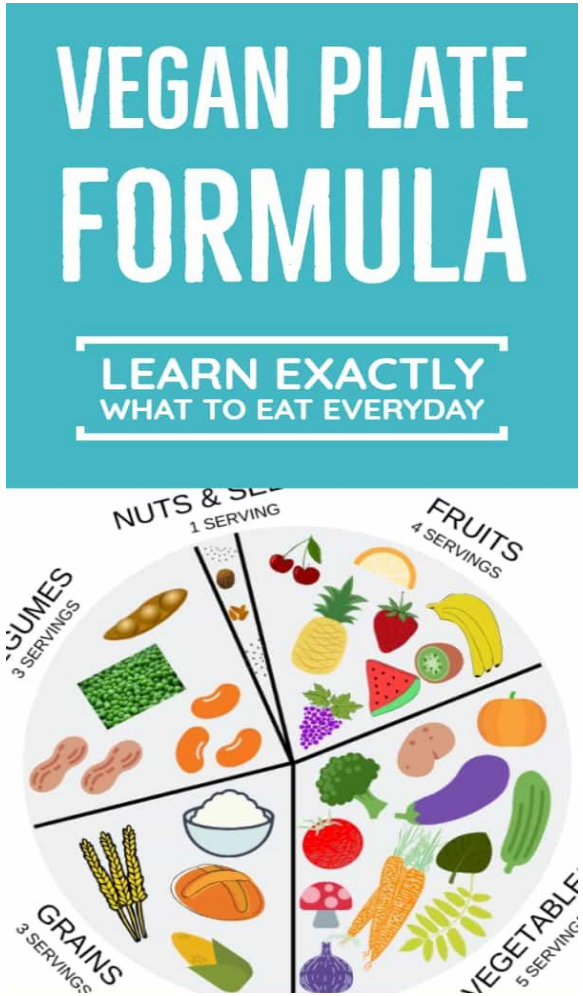
A Broken Food System



Modeling your plate like this one builds a healthy diet and a sustainable world.



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A

The Double Pyramid for Adults, 5th Edition

ENVIRONMENTAL PYRAMID

FOOD PYRAMID

	DAILY IMPACT			WEEKLY IMPACT		
	Carbon Footprint (gCO_2eq)	Water Footprint (liters)	Ecological Footprint (global m^2)	Carbon Footprint (gCO_2eq)	Water Footprint (liters)	Ecological Footprint (global m^2)
7 TIMES VEGAN MENU	1,683.05	1,389.09	13.79	11,781.38	9,723.61	96.52
7 TIMES VEGETARIAN MENU	2,436.18	1,533.26	14.81	17,053.26	10,732.81	103.69
5 TIMES VEGETARIAN MENU 2 TIMES OMNIVORE MENU	3,613.35	2,420.55	21.46	25,293.47	16,943.89	150.22
7 TIMES OMNIVORE MENU	6,556.29	4,638.80	38.08	45,893.99	32,471.57	266.53

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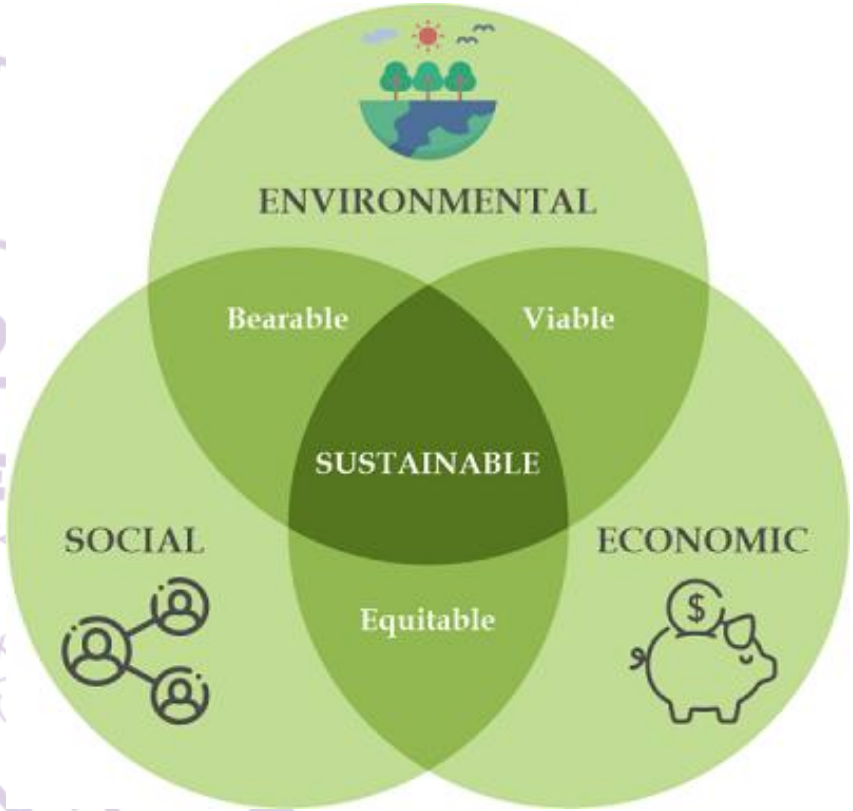
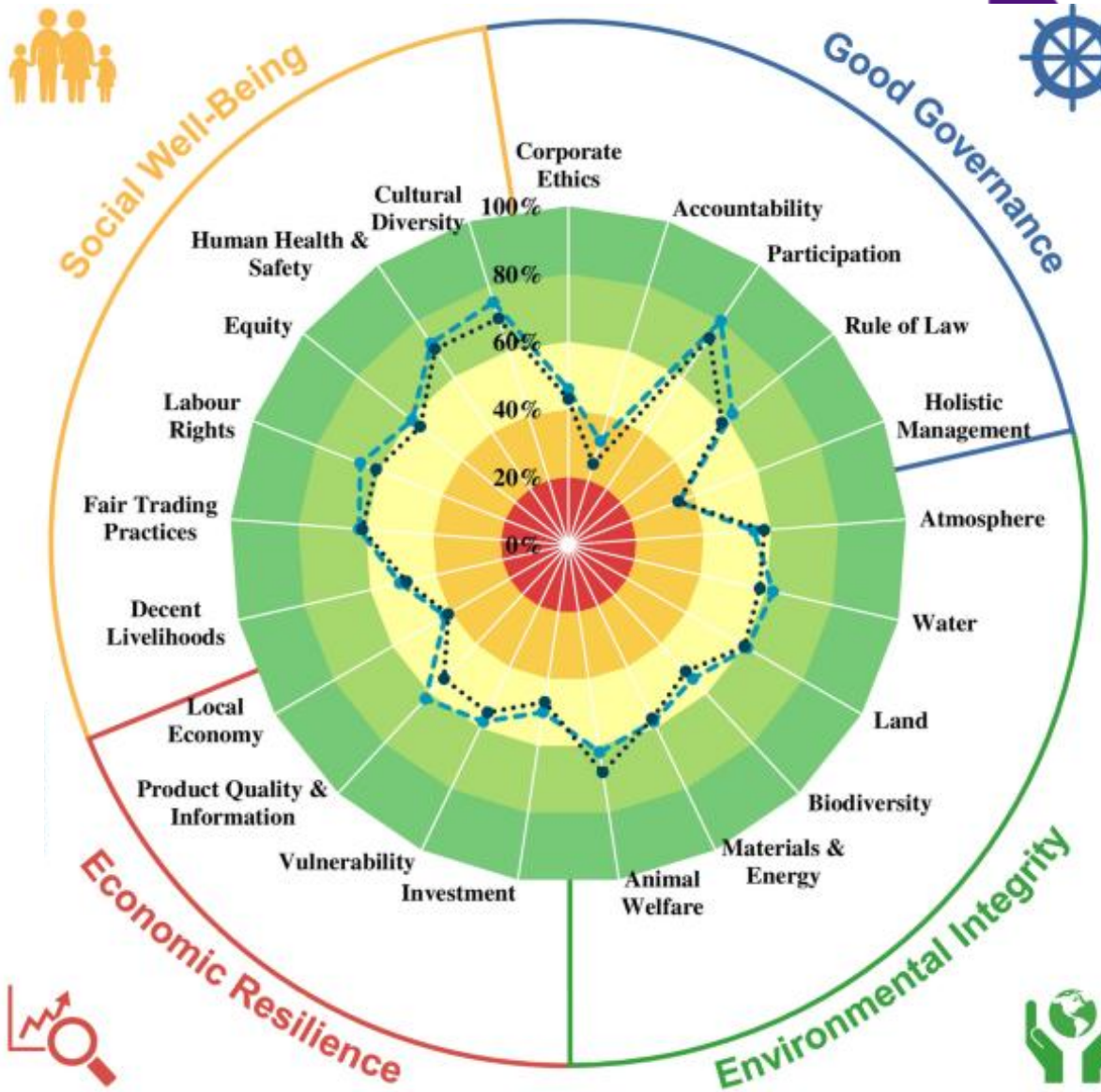
Beyond carbon





Moving towards a more **holistic** view of **sustainability** that incorporates, GHGs, biodiversity, water quality and soil health

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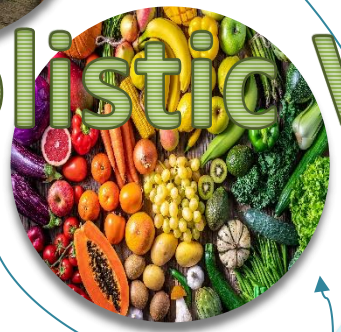
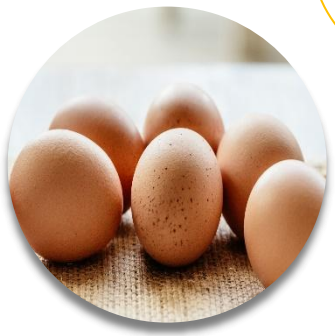
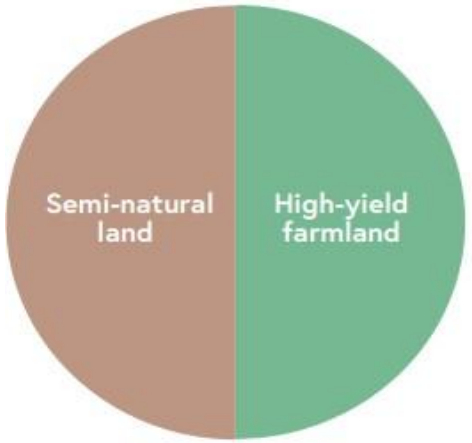
A Holistic View of Livestock



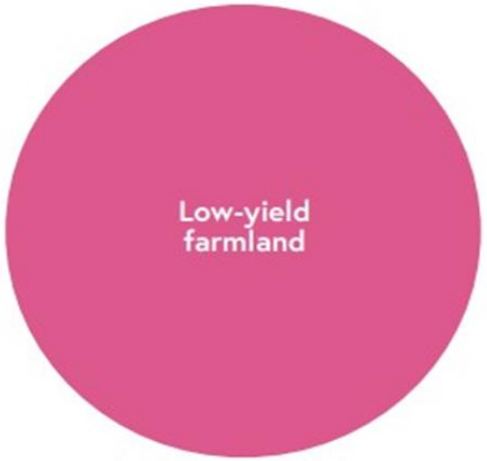


The road(s) to net zero

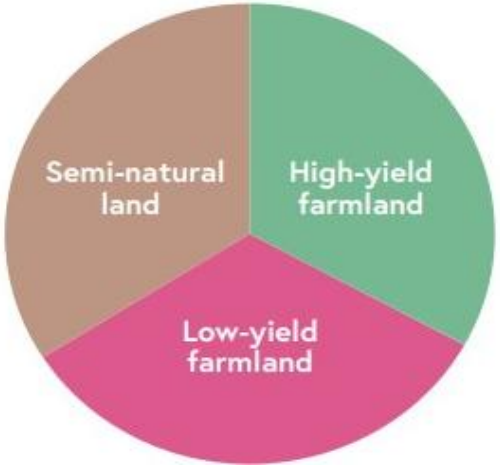
Land sparing

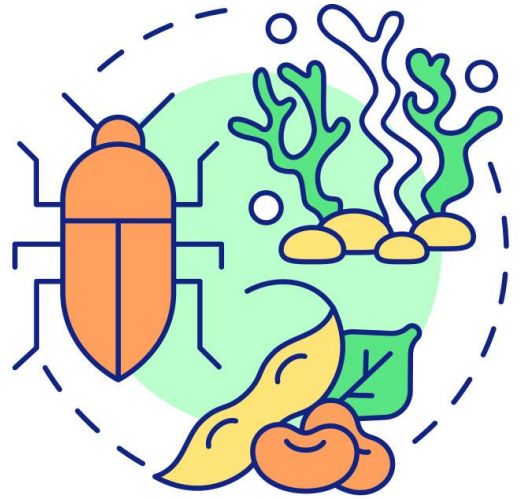


Land sharing



Three Compartment Model





Sustainable Intensification

Regenerative Agriculture

A three Compartment model

Alternative Proteins

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Sustainable Intensification (‘land sparing’)

- Targeted intensive production / sparing land elsewhere for nature
- Feed alternatives and additives to inhibit CH4: directly or via rumen microbiome & reduce GHG emissions in their production cycle
- Animal breeding / genetics: including genotyping & phenotyping for animals & microbiome
- Precision farming (nutrient applications, vertical farming)
- Integrated Pest Management

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Regenerative Agriculture ('land sharing')

- Reduce tillage
- Keep the soil covered – cover crops, under-sow
- Use cover crops & crop rotations
- Crop diversity – polyculture, herbal leys, legumes
- Incorporate perennials and trees (silvo-pasture & agroforestry)
- Zero/low use of external inputs; maximize on-farm inputs
- Natural pesticides
- Use organic fertilizers
- Focus on localism and/or regionalism & small-scale systems

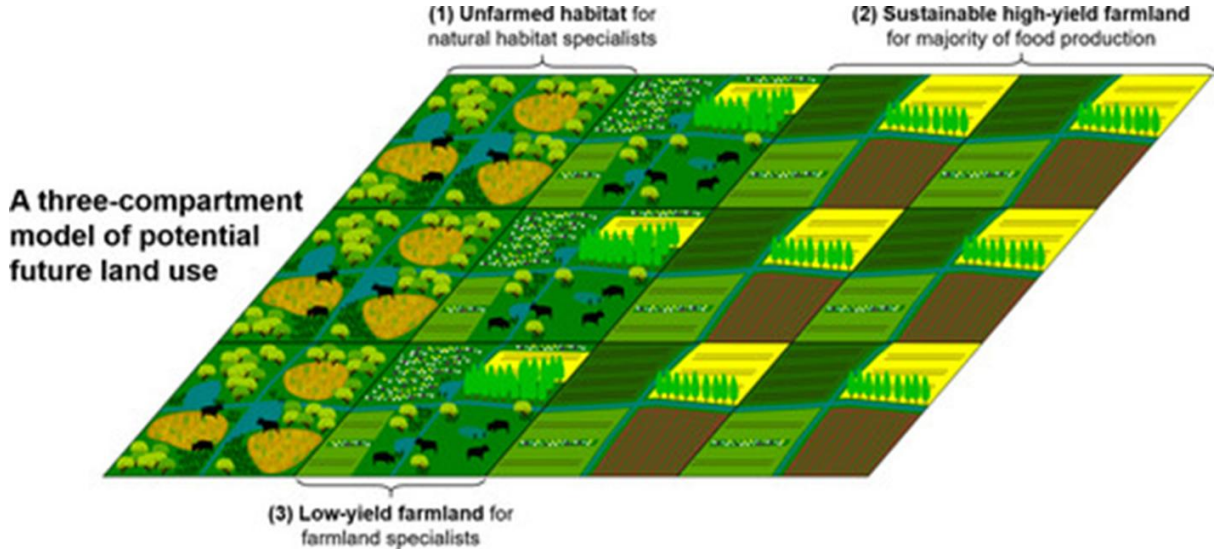
A three-compartment model of land use

(1) Unframed habitat (rewilding)

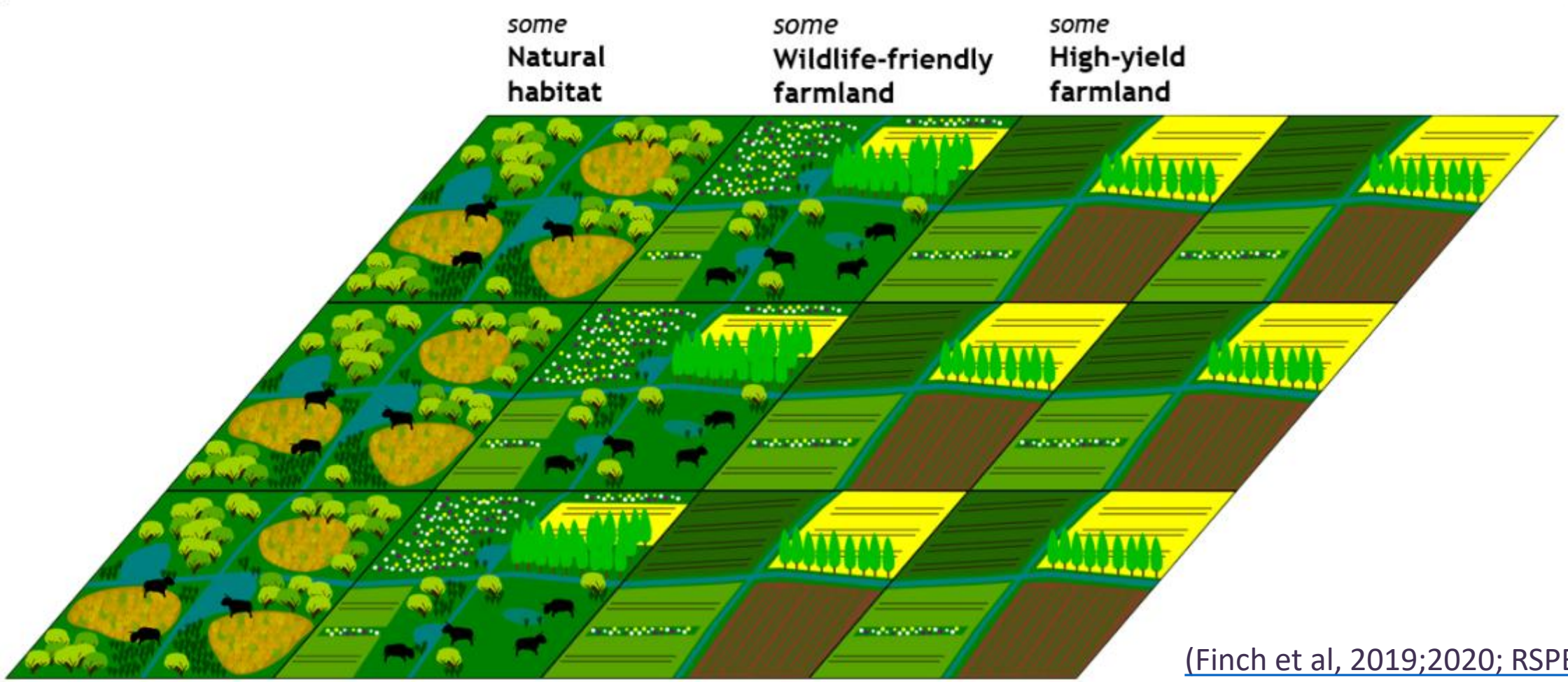
(2) Sustainable high-yield farmland for majority of food production (land sparing)

(3) Low-yield farmland (land sharing)

(Finch et al, 2020)

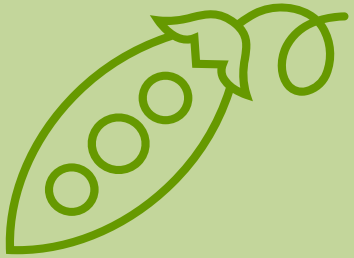


A combination of unfarmed land, regenerative agriculture and sustainable high-yield farmland

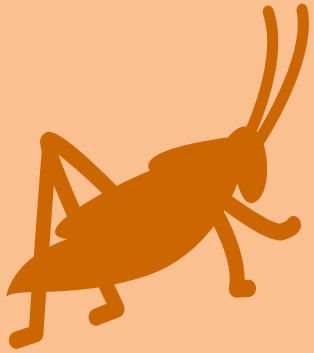


(Finch et al, 2019;2020; RSPB, 2019)

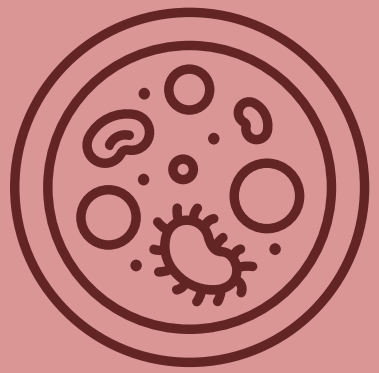
Role of alternative protein sources



Plant-based Proteins

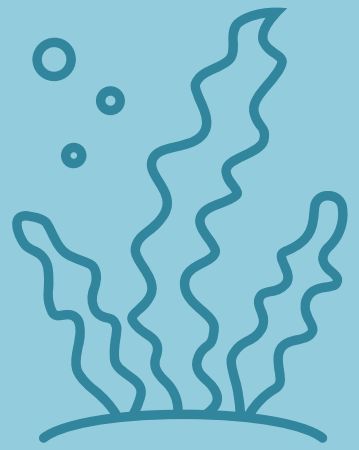


Insect proteins



Fermentation-based Proteins

Cultivated meat



Algae and seaweed

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