Feeding East Africa Sustainably: The Promise of Regenerative Agriculture in the Food-Energy-Water Nexus

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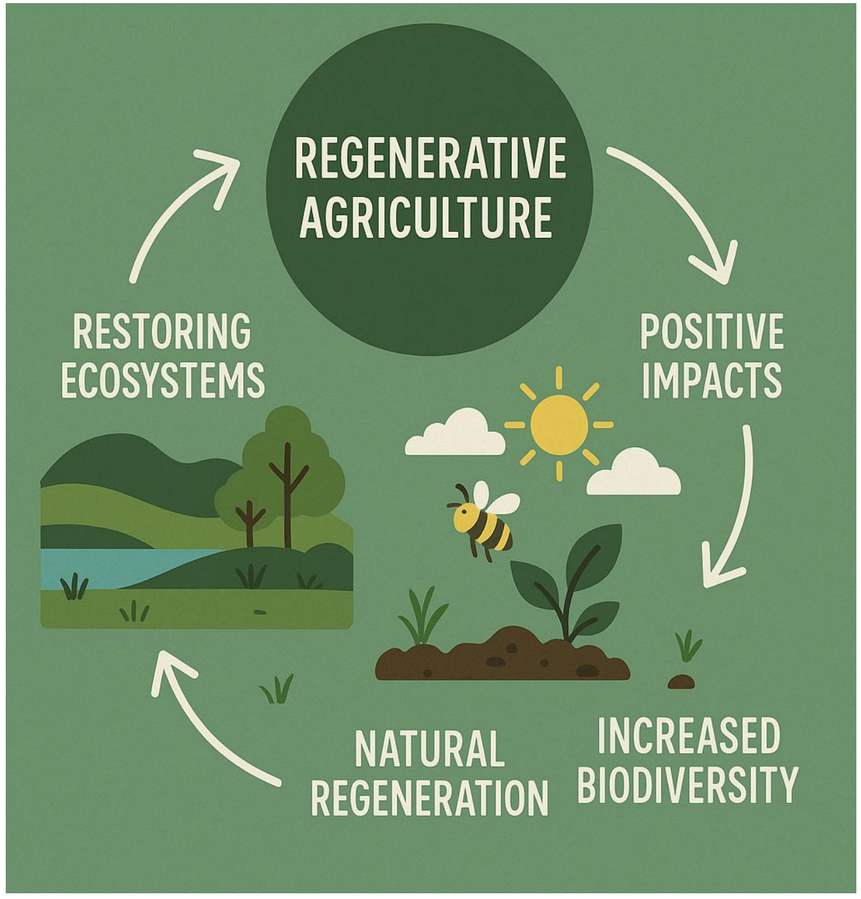
Claims that the global food system is ‘in crisis’ or ‘broken’ are increasingly common

It's 2050, and aerial photographs reveal a green planet filled with healthy forests, thriving wetlands, abundant grassland biomes, and diverse, sustainable agricultural lands.

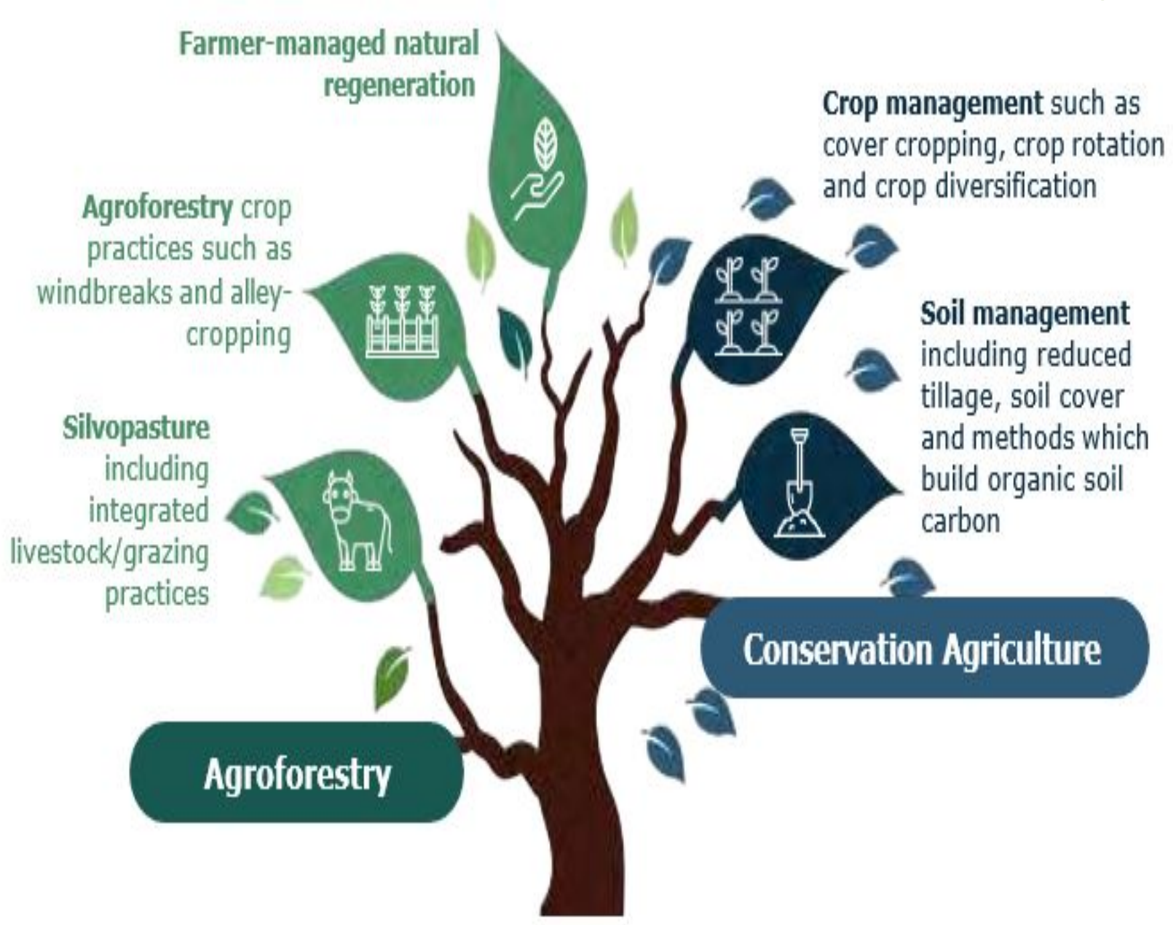
How to achieve a green planet ?

Lost in a sea of sustainable concepts…

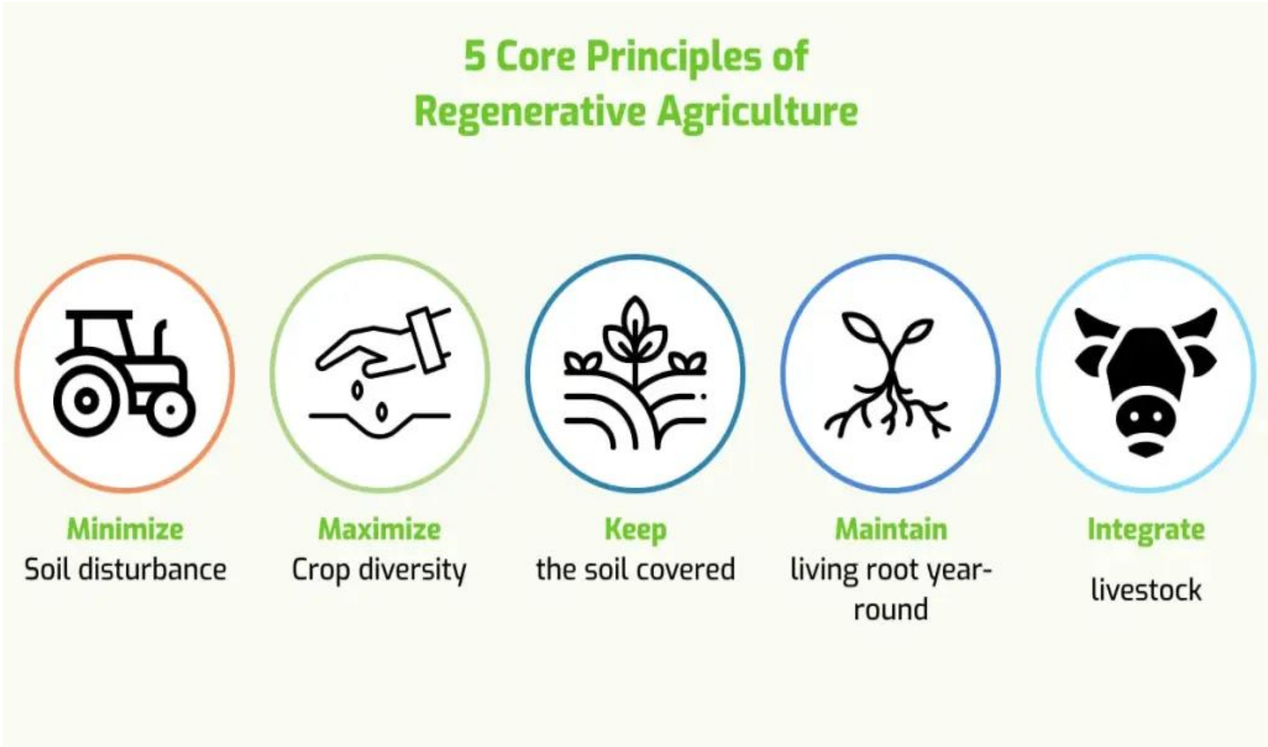
- While there is broad agreement on the need to transform food systems and make them more *sustainable*
- Differing interpretations of what this means in practice
- Increasing competition between various approaches and terminologies like Agroecology, Climate-smart agriculture, Sustainable intensification, Nature-based solutions; nature-positive solutions, Conservation agriculture,organic agriculture



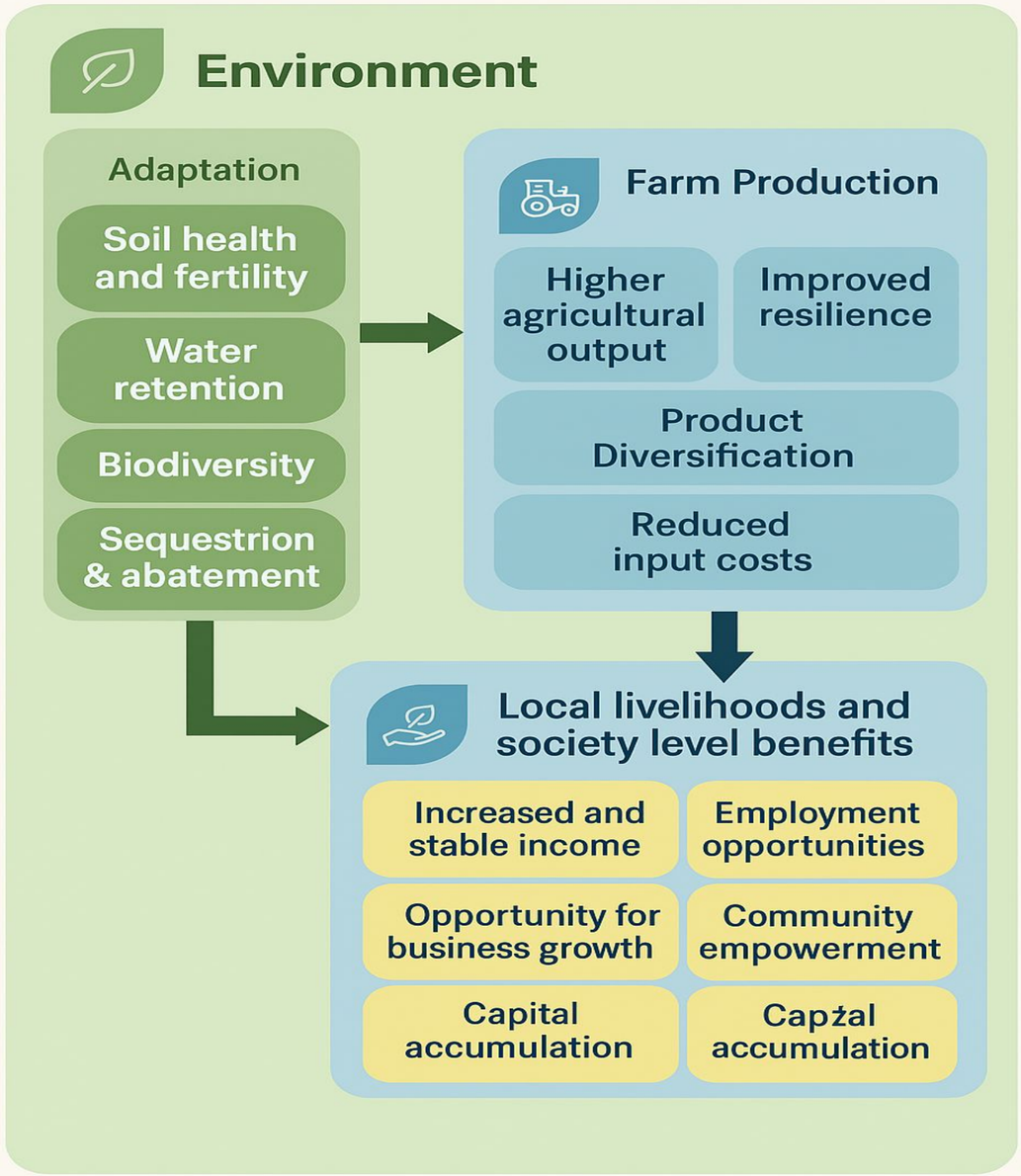
Regenerative Agriculture?



Regenerative Agriculture (RA) is an approach to agricultural production that integrates **scientific and local knowledge** to actively **conserve and restore** ecosystems and biodiversity in and around production areas, helping to reduce the environmental footprint, build resilience, and increase productivity, all while improving human health and well-being



REGENERATIVE AGRICULTURE: Why



01 About 1/3 of the world's C is stored in the soil beneath our feet, making it the second largest carbon store on Earth after the ocean

02 Agriculture is the driver of 30% GHG and 80% global deforestation; associated environmental, health and socio-economic costs amount to about 12 trillion dol/yr.

03 Reduction in soil erosion and water pollution with decreased animal biodiversity; increased water storage capacity (<floods); reduction of desertification

04 Harmonizes agricultural operations with ethical and ecological objectives; it also has economic value

How is RA implemented?

Stages of Regenerative farming practices

	1 Basic implementation	2 Intermediate implemenetation	3 Advanced implementation
	No-till practices, inċduding direct seeding	Minimal soil-disturbing mulch system	Intercropping
	Minimal soil-disturbing subsoiling	Undersown cropping	
	Cover cropping	Boïertilīzer/bïó-stimulantss and biological seed coating	
Inputs	Soil analysis and balancing		
		Legume crop rotation	Agroforestry
Structure	*No structural practices in basic implementation stage*		Livestock integration
			Optional: Pasture cropping

Regenerative Agriculture as the Green Revolution

AGRONOMIC

Producing more and of greater quality, with greater efficiency in the use of inputs

✓

ENVIRONMENTAL-ECOSYSTEMIC

Preserving water quality and increasing soil health and biodiversity

✓

ECONOMIC-FINANCIAL

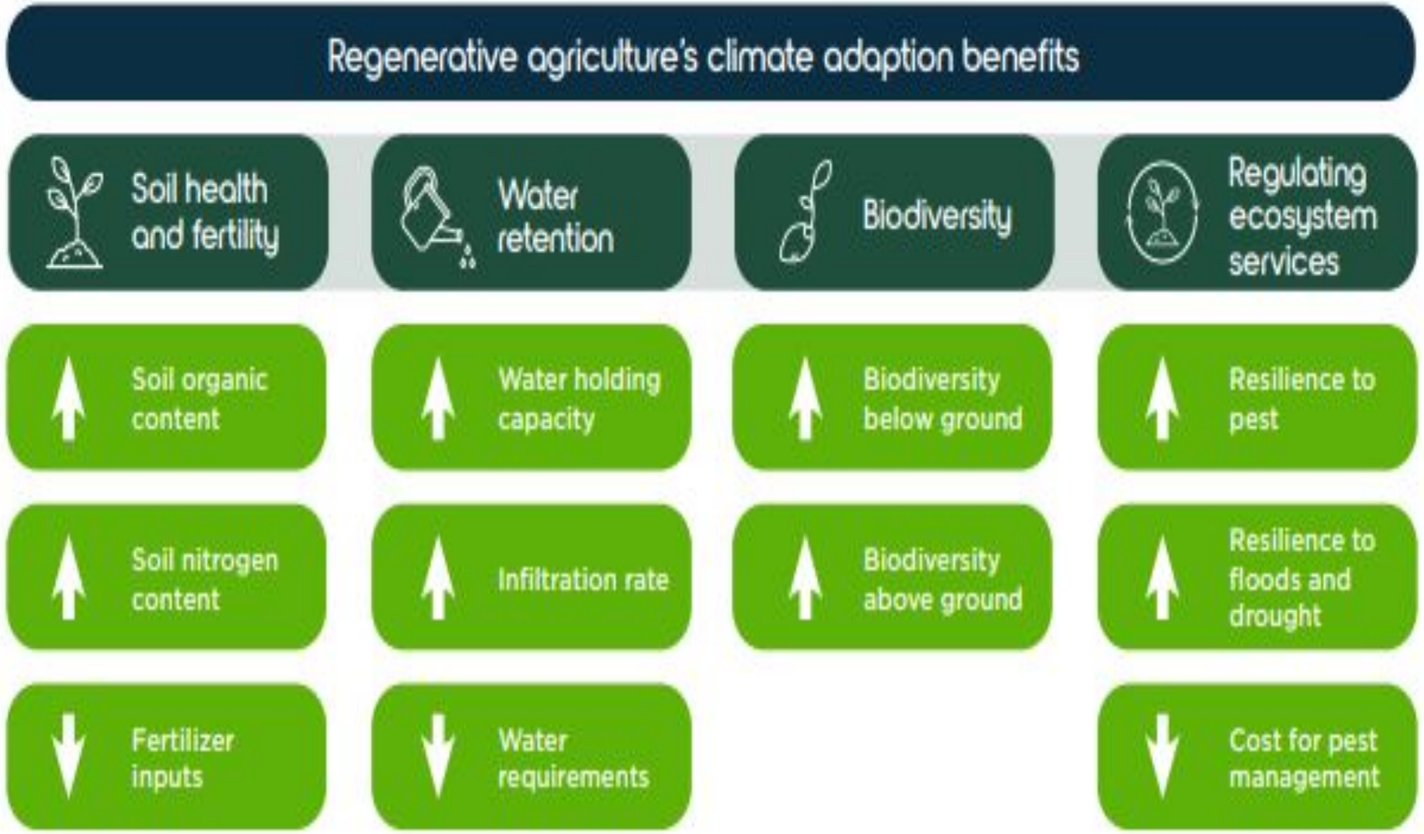
Greater profitability per surface area and/or investment; more diversification

✓

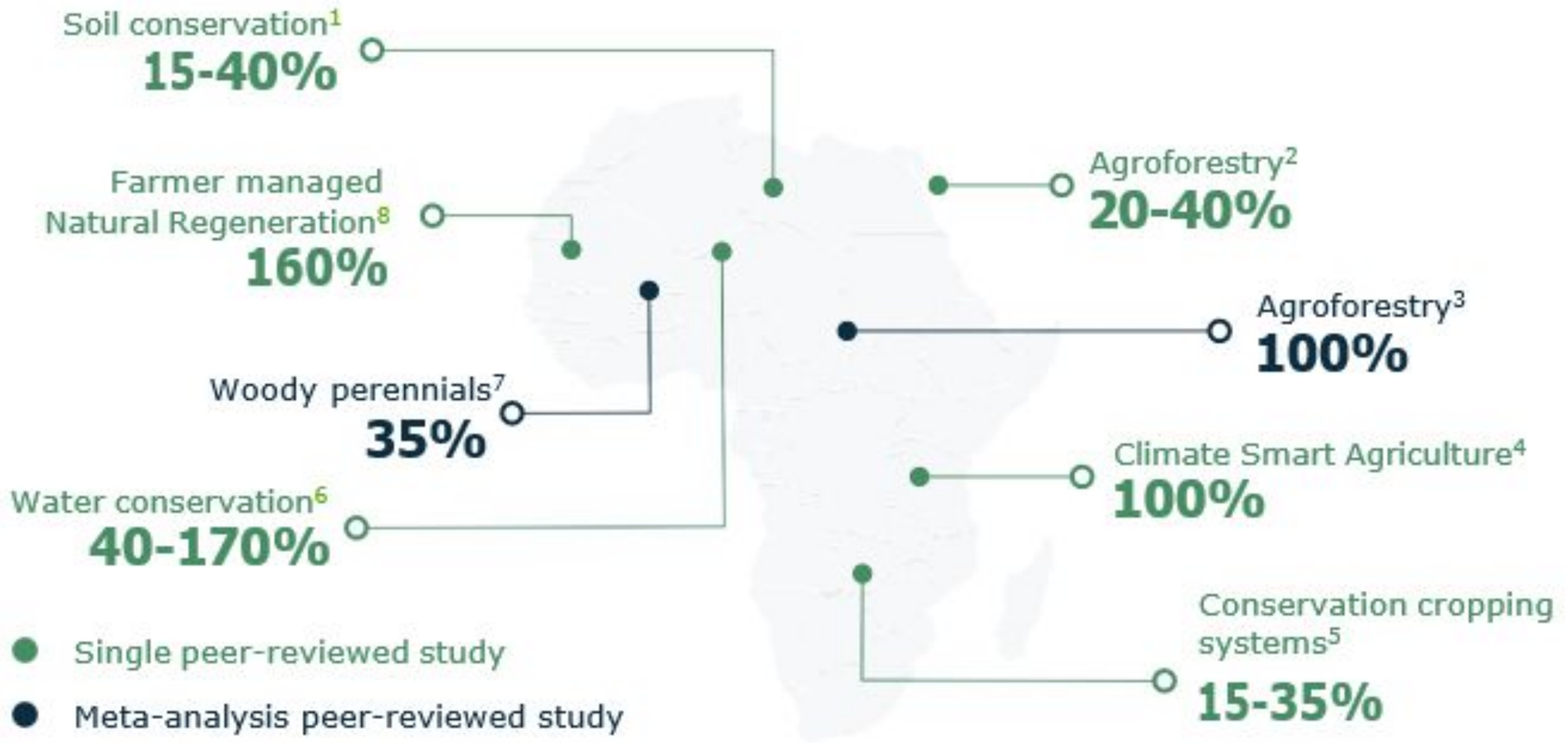
SOCIAL

Achieving greater development of rural communities with greater inclusion and equity

✓



REGENERATIVE AGRICULTURE: Impacts



REGENERATIVE AGRICULTURE: Impacts

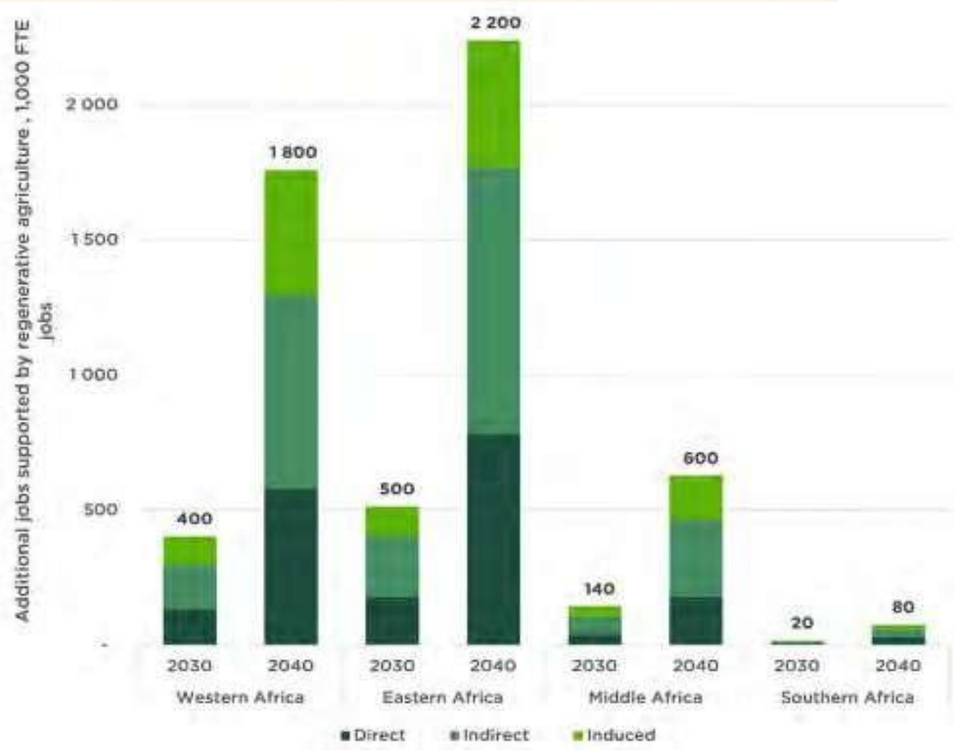
Regenerative agriculture's impacts by 2040

- **13%** Increase in per capita food cons-sumption
- **16-24%** Reduction in food prices
- **5-15%** Reduction in household food expenditure
- **16%** Increase in calorie intake per capita

- **20%** Increase in soil organic carbon*
- Increase in soil nitrogen content* **24%**
- **17-60%** Increase in water infiltration rate*
- Reduction in soil erosion* **30%**

$150 Estimated yearly savings per hectare

$17 bln Estimated yearly savings if regenerative agricuture is adopted on 50% of cropland



Agronomic Principles and Practices in Regenerative Agriculture

Principles	Practices	Restoration of Soil Health	Reversal of Biodiversity Loss
Minimize tillage	Zero-till, reduced tillage, conservation agriculture, controlled traffic	***	–
Maintain soil cover	Mulch, cover crops, permaculture	***	*
Build soil C	Biochar, compost, green manures, animal manures	***	–
Sequester carbon	Agroforestry, silvopasture, tree crops	***	**
Rely more on biological nutrient cycles	Animal manures, compost, compost tea, green manures and cover crops, maintain living roots in soil, inoculation of soils and composts, reduce reliance on mineral fertilizers, organic agriculture, permaculture	***	–
Foster plant diversity	Diverse crop rotations, multi-species cover crops, agroforestry	**	***
Integrate livestock	Rotational grazing, holistic [Savory] grazing, pasture cropping, silvopasture	**	?
Avoid pesticides	Diverse crop rotations, multi-species cover crops, agroforestry	*	***
Encouraging water percolation	Biochar, compost, green manures, animal manures, holistic [Savory] grazing	***	–

*** = Strong impact

** = Moderate impact

– = No notable impact

? = Uncertain/unclear

Source: Giller et al. (2021), based on McGuire (2018), Burgess et al. (2019), and Merfield (2019).

Why is the adoption of RA practices slow?

Fear and uncertainty of change

Resistance to adopt new practices due to perceived risks, lack of clear information, and fear of short-term losses.

Limited awareness

Insufficient understanding among farmers, businesses, and policymakers of regenerative agriculture's long-term aconomic and ecological benefits

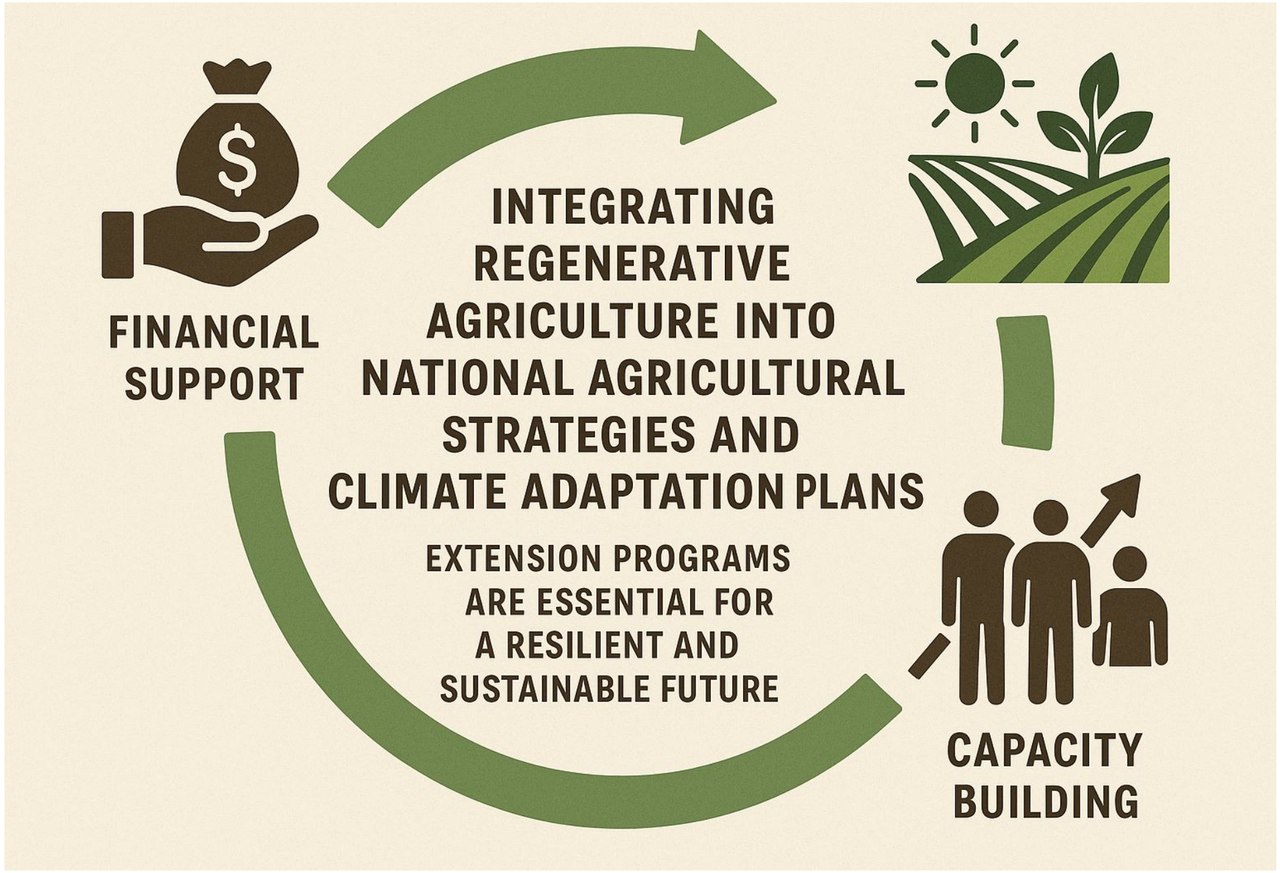
Limited access to inputs

Challenges in sourcing appropriate seeds, biofertilizers, cover crops, and technical support needed to implement regenerative practices

Policy support gaps

Limited or misaligned policy incentives, subsidies, and institutional frameworks that could otherwise accelerate adoption

Way Forward


FINANCIAL SUPPORT
INTEGRATING REGENERATIVE AGRICULTURE INTO NATIONAL AGRICULTURAL STRATEGIES AND CLIMATE ADAPTATION PLANS
EXTENSION PROGRAMS ARE ESSENTIAL FOR A RESILIENT AND SUSTAINABLE FUTURE
CAPACITY BUILDING

Conclusion

- More than a set of practices, regenerative agriculture represents a paradigm shift, one that aligns ecological restoration with improved food security, water conservation, and energy efficiency.
- By moving beyond sustainability toward regeneration, East Africa can revitalise its agricultural landscapes while securing the foundational resources needed for long-term prosperity

Thank you