

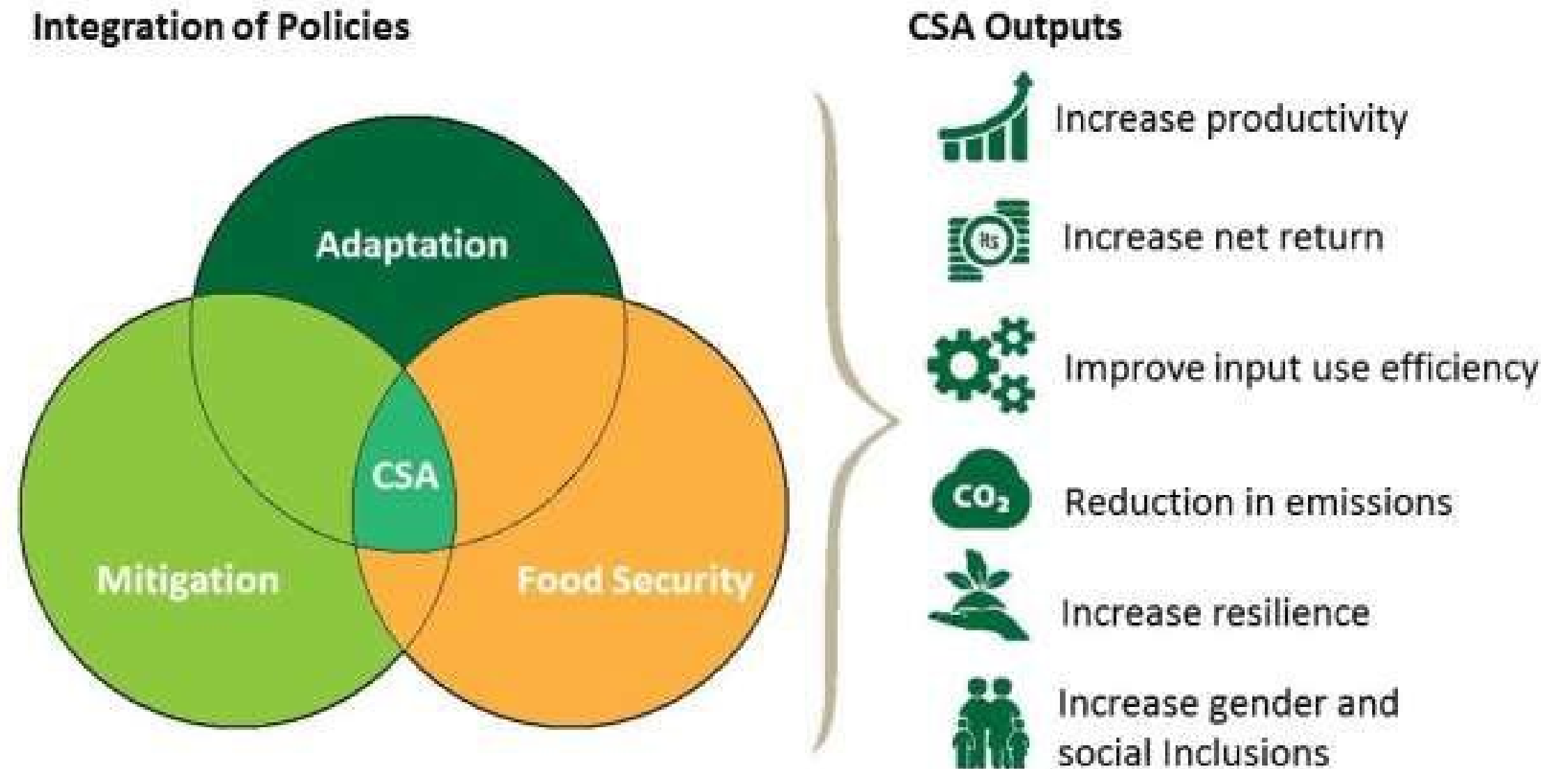
Basics of data-driven Climate Smart Agriculture - part 1

Climate Smart Agriculture (CSA)


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What is CSA

- Climate-Smart Agriculture (CSA) is an approach to help steer agricultural systems to function and respond effectively to climate changes through 3 principles [1][2]
 - Food security
 - Adaptation
 - Mitigation



CSA context

CSA paradigms can be tuned to different spatial contexts



Farm



Landscape



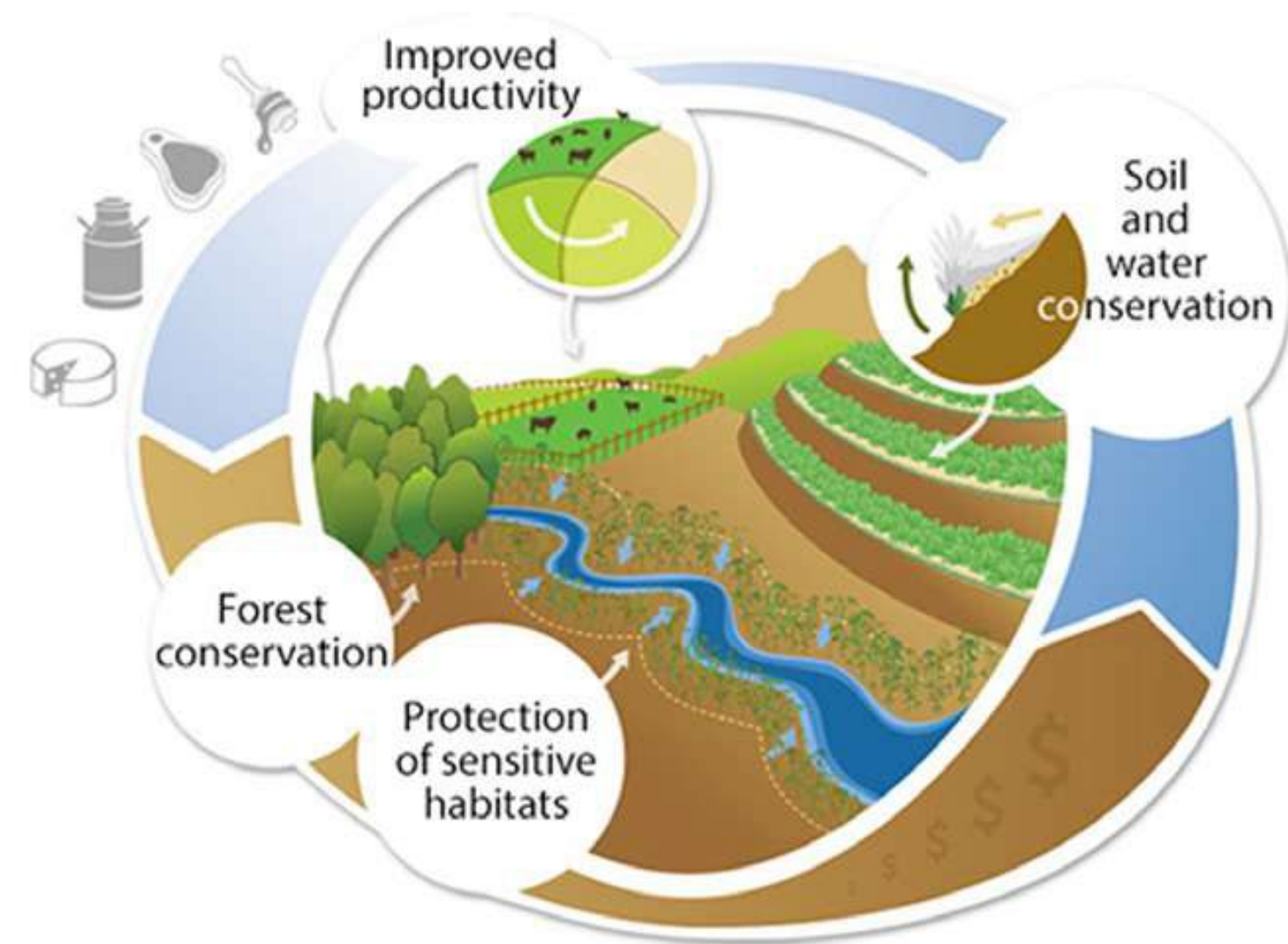
Regional/National/Global



Markets

Why adopt CSA – at farm level

- Like any business – farms need to change/adapt with changing circumstances
- Circumstances such as – climate, policies, markets
- With growing understanding of ecosystem functions – necessary to recalibrate the driving strategy behind operations
- Mounting evidence of short-term optimizations assuming constant climate is detrimental – increasing emphasis on calibrating on long-term effects of operations and increasing productivity through soil resilience.



CSA Elements



Different elements of climate-smart agricultural systems include:

- Management of farms, crops, livestock, aquaculture and capture fisheries to balance near-term food security and livelihoods needs with priorities for adaptation and mitigation.
- Ecosystem and landscape management to conserve ecosystem services that are important for food security, agricultural development, adaptation and mitigation.
- Services for farmers and land managers to enable better management of climate risks/impacts and mitigation actions.
- Changes in the wider food system including demand-side measures and value chain interventions that enhance the benefits of CSA.

Regenerative agriculture/Carbon farming



- The practice can be positioned within a wider movement of ecological, or stable methods of food production (e.g., organic, biodynamic) and was popularized in the early 1980's by Robert Rodale [\[3\]](#)
- Overlaps with many more established agricultural practices, including conservation agriculture and agroecology, the terminology of “regenerative agriculture” (RA) has gained traction in more recent times. The definition of RA, however, remains subjective
- Most common to “to improve soil health,” while the most common process was to “use no or low external inputs; maximize on-farm inputs”

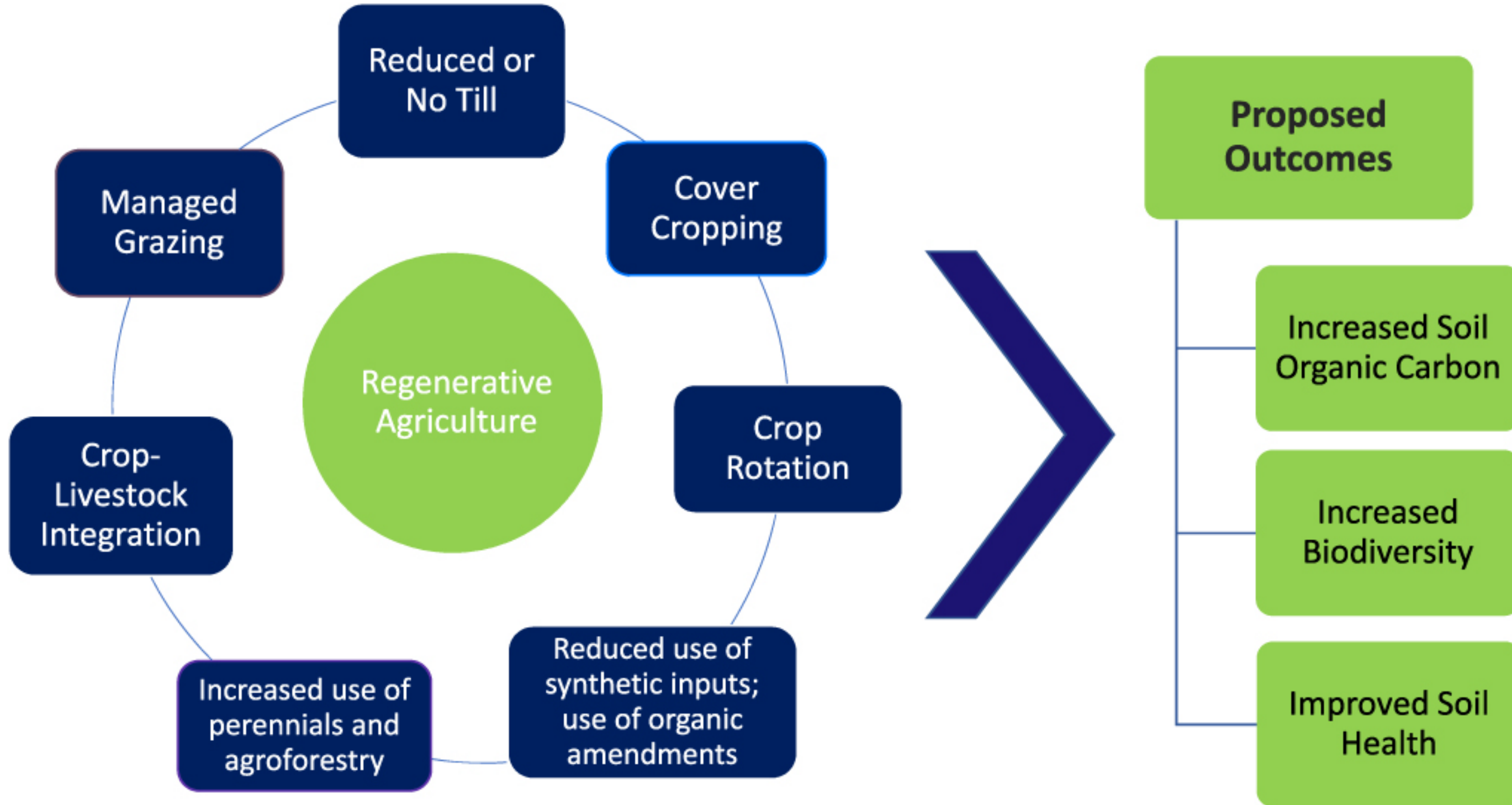
BSAG definition

General regenerative farming criteria for farms

1. Continuous development of competencies and operations
2. Purposefully improving and maintaining soil health
3. Biodiversity above and below ground is systematically reinforced
4. A diverse crop rotation
5. All-year-round, living vegetation cover is maximised
6. Minimised tillage
7. Nutrient use is based on plant needs and relies on organic fertilisers and biological nitrogen fixation
8. The use of plant protection products is minimised



Methodology – summary [4]



Exercise:

For greater details on aspects of regenerative farming consider completing the RA course offered at the BSAG website

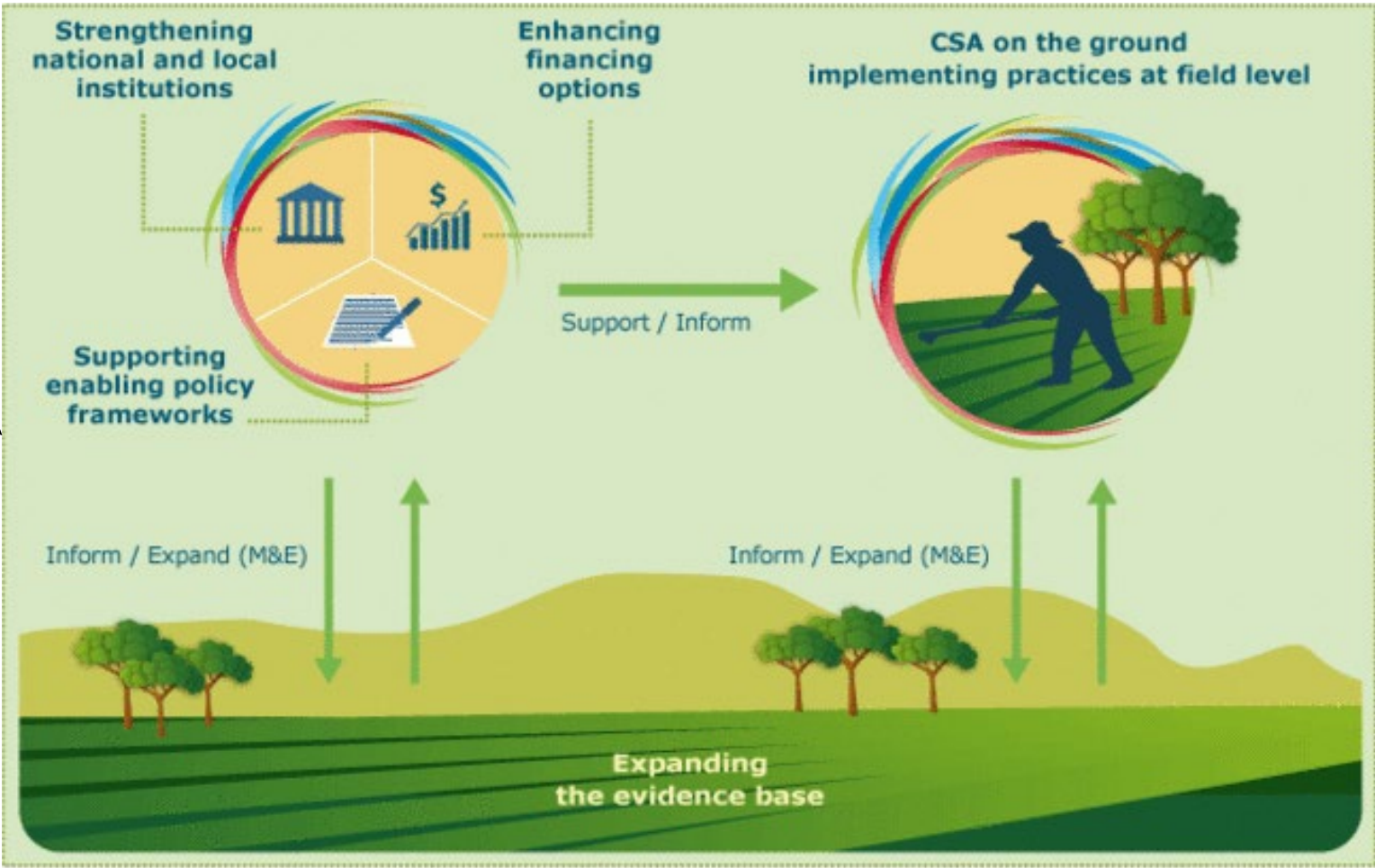


Crash course in regenerative farming

Renew your understanding of farming and sustainability in food production. This course is specifically targeted at companies and policymakers, and provides scientific information on regenerative farming in an approachable format. After completing this course, you will understand how we can use food production to tackle the major challenges of our time – climate change, nature loss and the eutrophication of our waterways – whilst also improving farmers' livelihoods and food security.

<https://courses.bsag.fi/en/>

From CSA to RA



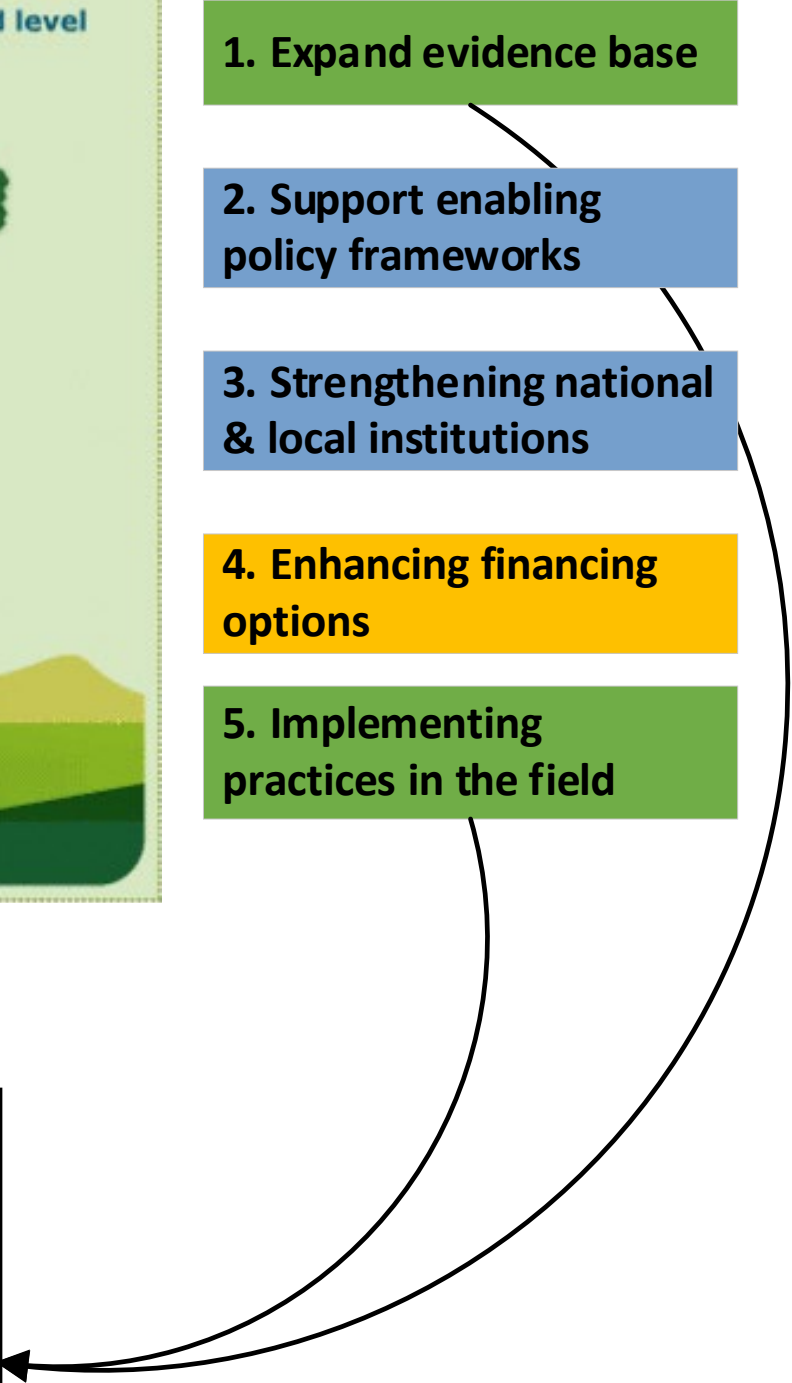
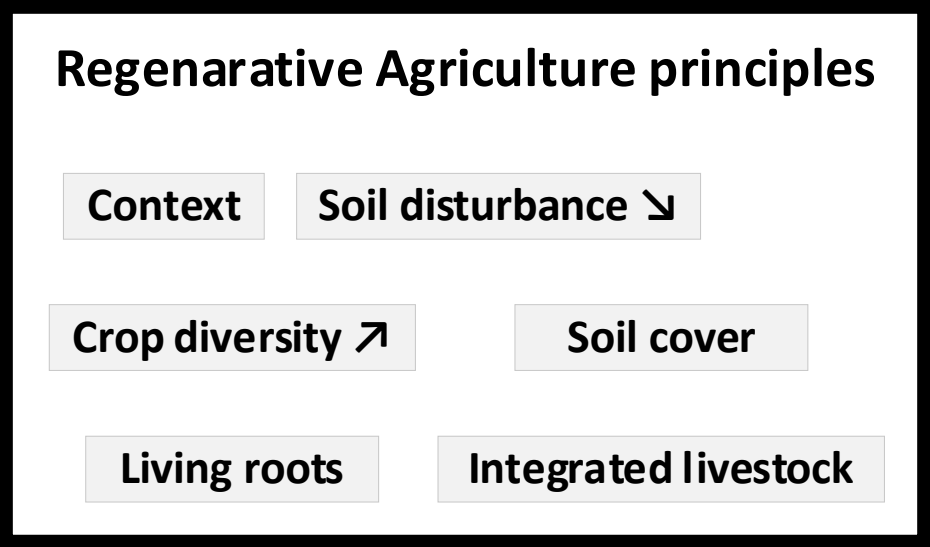
1. Expand evidence base

2. Support enabling policy frameworks

3. Strengthening national & local institutions

4. Enhancing financing options

5. Implementing practices in the field



Summary



- CSA practices can assist farmers in:
 - Sustainably increasing their productivity and incomes;
 - Adapting and building resilience to climate change; and
 - Reducing and/or removing greenhouse gas emissions.
- CSA is only effective if the practices and technologies chosen are suited to the local situation.
- Unsustainable farming practices damage the natural resource base (e.g. water pollution, soil degradation) affecting future yields.
- CSA offers solutions at multiple levels e.g. farm, landscape, policy.
- Different CSA practices address different climate-related challenges. For example, farmers' lacking access to information to improve their decision making may require a weather/knowledge smart CSA intervention.

What does it mean to...



- The farmer – understand the specific context and build strategy and goals
- The researcher – understand the evidence necessary to build protocols
- The administrator – access data evidence and balance competing interests to optimize policy

Data plays a vital role in fulfilling each of the above actor's roles

References



1. Waswa, B.; Templer, N.; Jalango, D.; Nderi, A.; Kinyua, I. (2023) Climate-smart agriculture: A guide for farmers. Cali (Colombia): Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA). 33 p. <https://hdl.handle.net/10568/131828>
2. FAO. 2021. Climate-smart agriculture case studies 2021 – Projects from around the world. Rome. <https://doi.org/10.4060/cb5359en>
3. Voisin, R., Horwitz, P., Godrich, S., Sambell, R., Cullerton, K., Devine, A., 2024. What goes in and what comes out: a scoping review of regenerative agricultural practices. Agroecology and Sustainable Food Systems 48, 124–158. <https://doi.org/10.1080/21683565.2023.2270441>
4. Rehberger, E., West, P.C., Spillane, C., McKeown, P.C., 2023. What climate and environmental benefits of regenerative agriculture practices? an evidence review. Environ. Res. Commun. 5, 052001. <https://doi.org/10.1088/2515-7620/acd6dc>