

Transition to circular (aquatic) food systems

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Introduction: Circular agriculture

1. Why is it relevant?
2. What is the scientific terminology?
3. How is it transformative?
4. Is it applicable to aquatic (aquaculture & wild caught fish) food systems?

1. Relevance

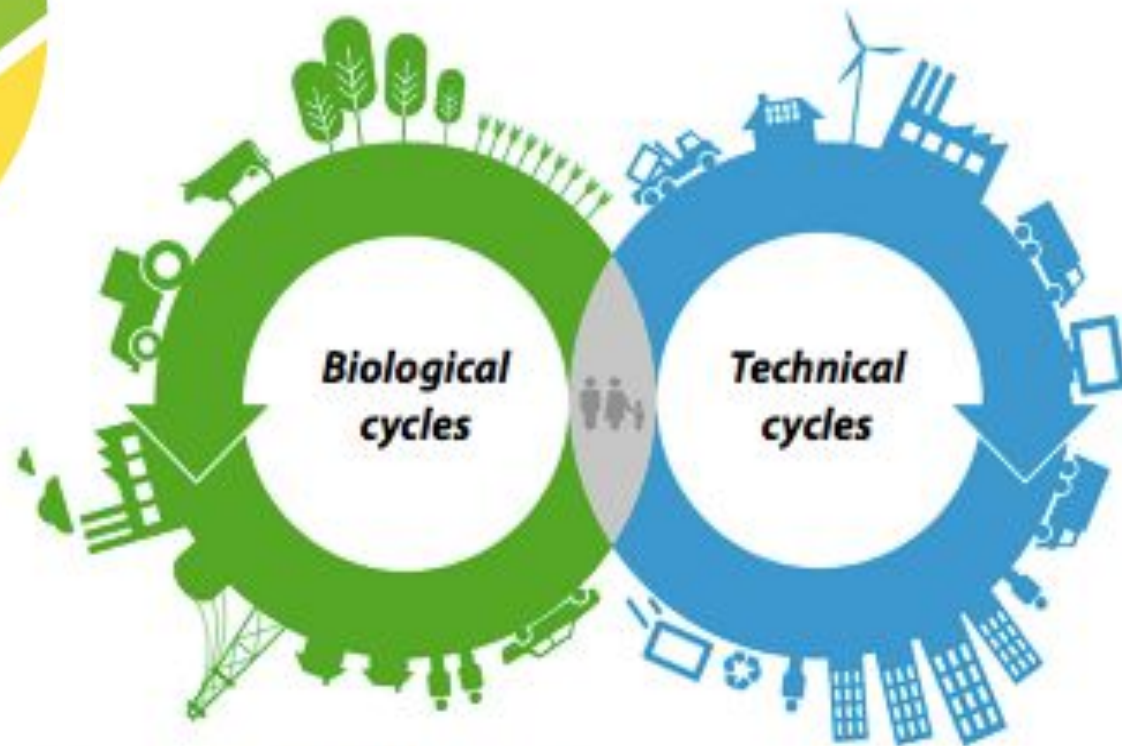


**Global Sustainable
Development Goals**

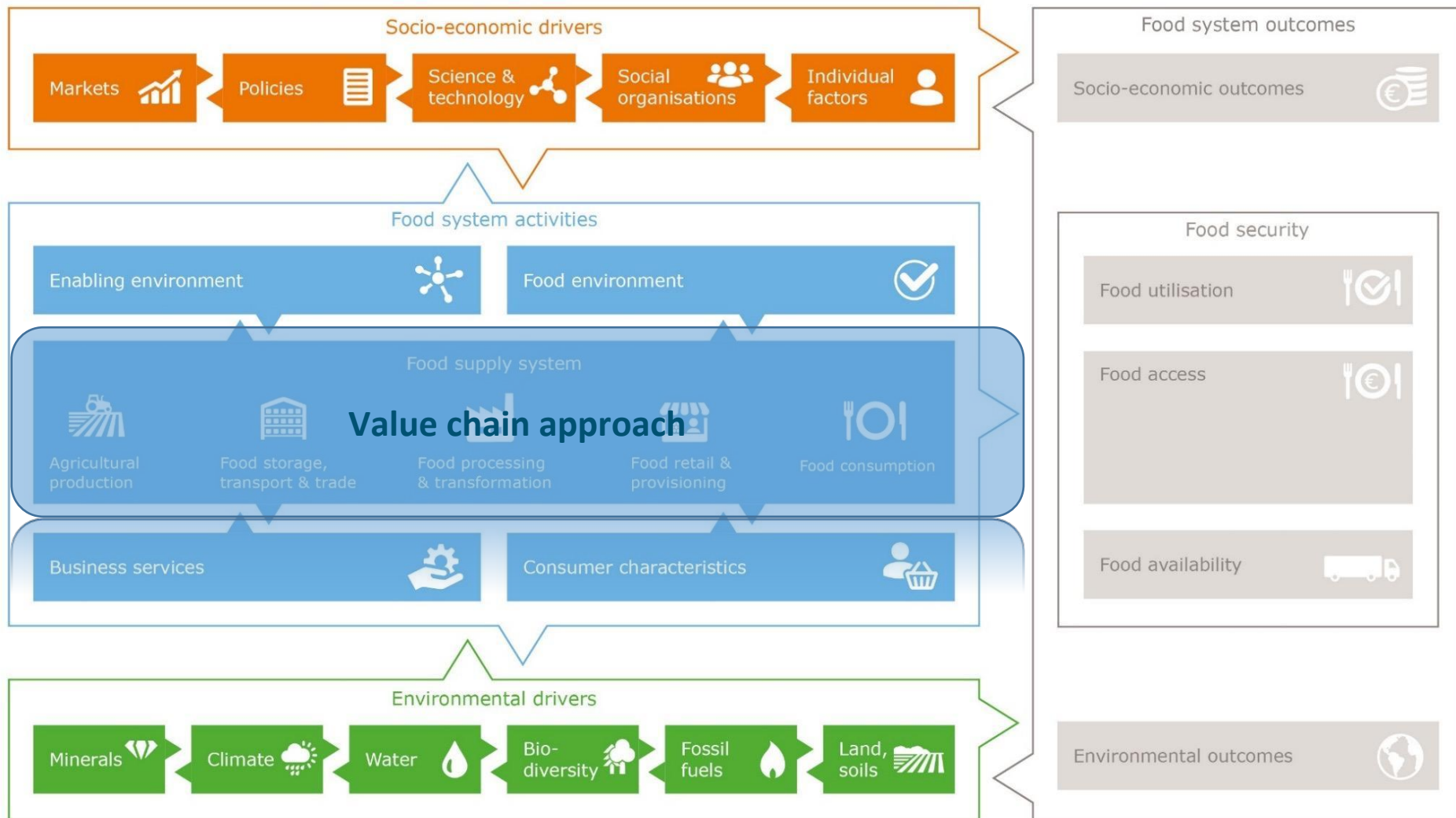
Agenda 2030

2. Terminology

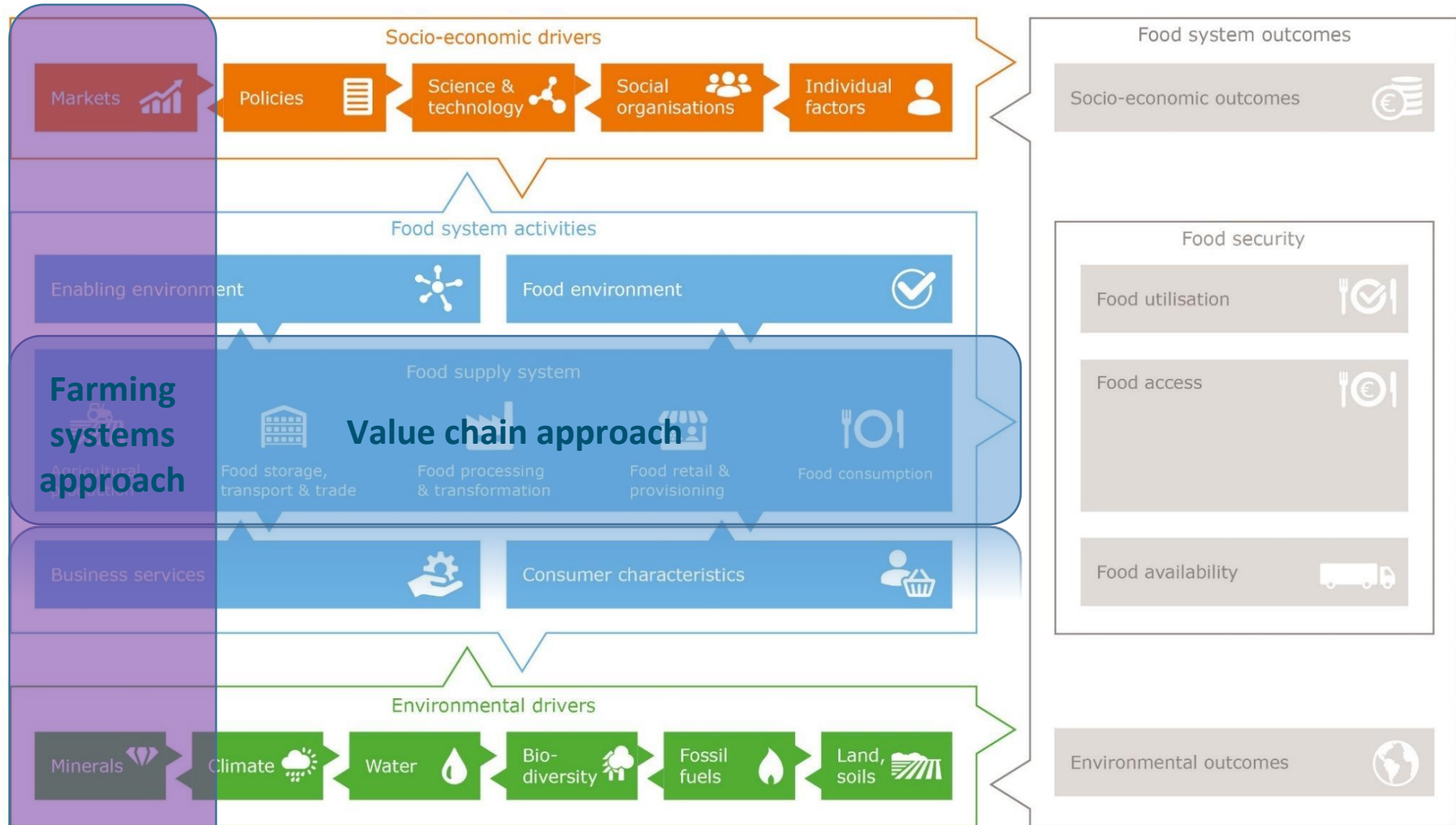
Product life cycle in a circular economy



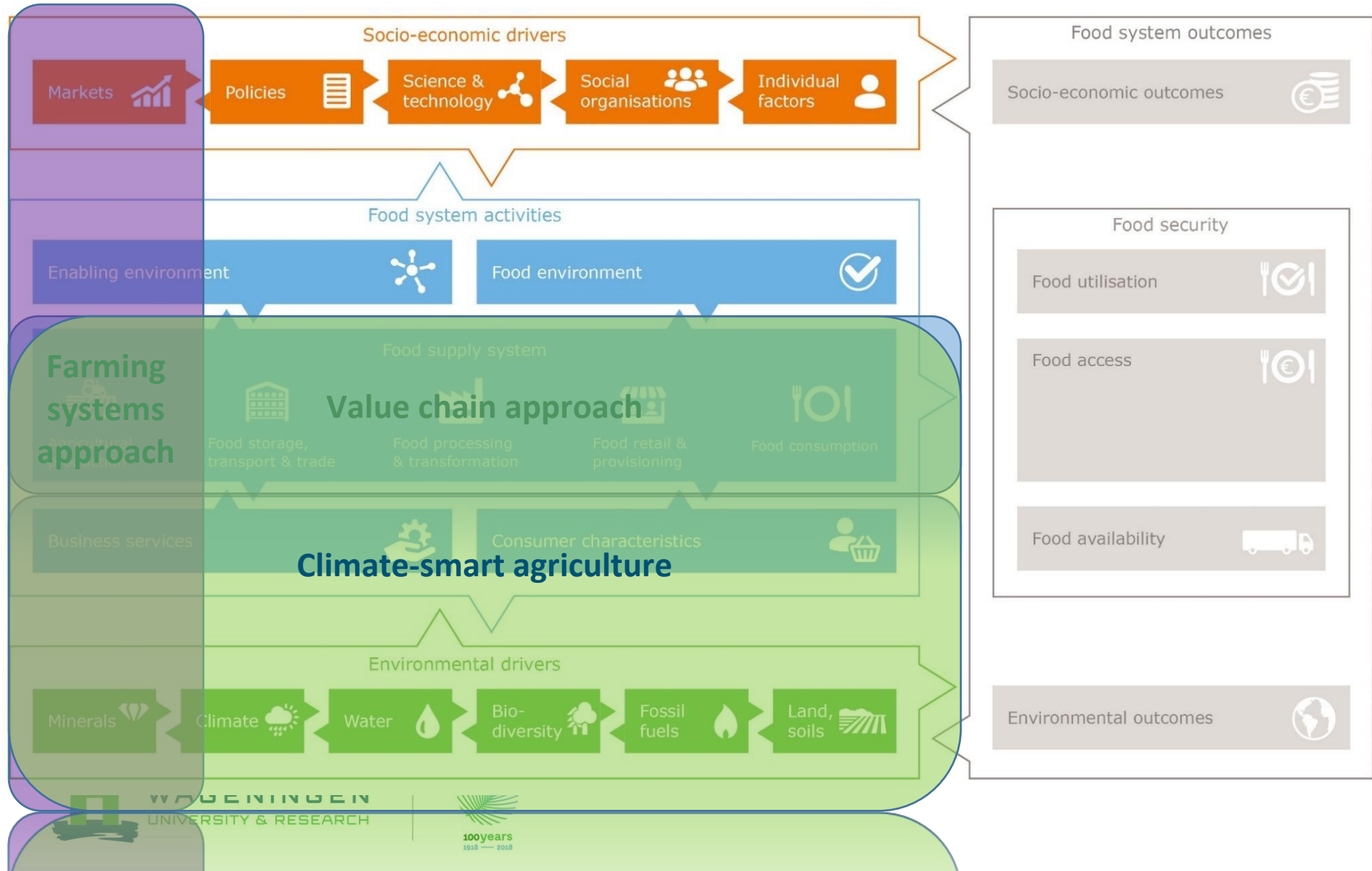
2.1 Value Chain Approach



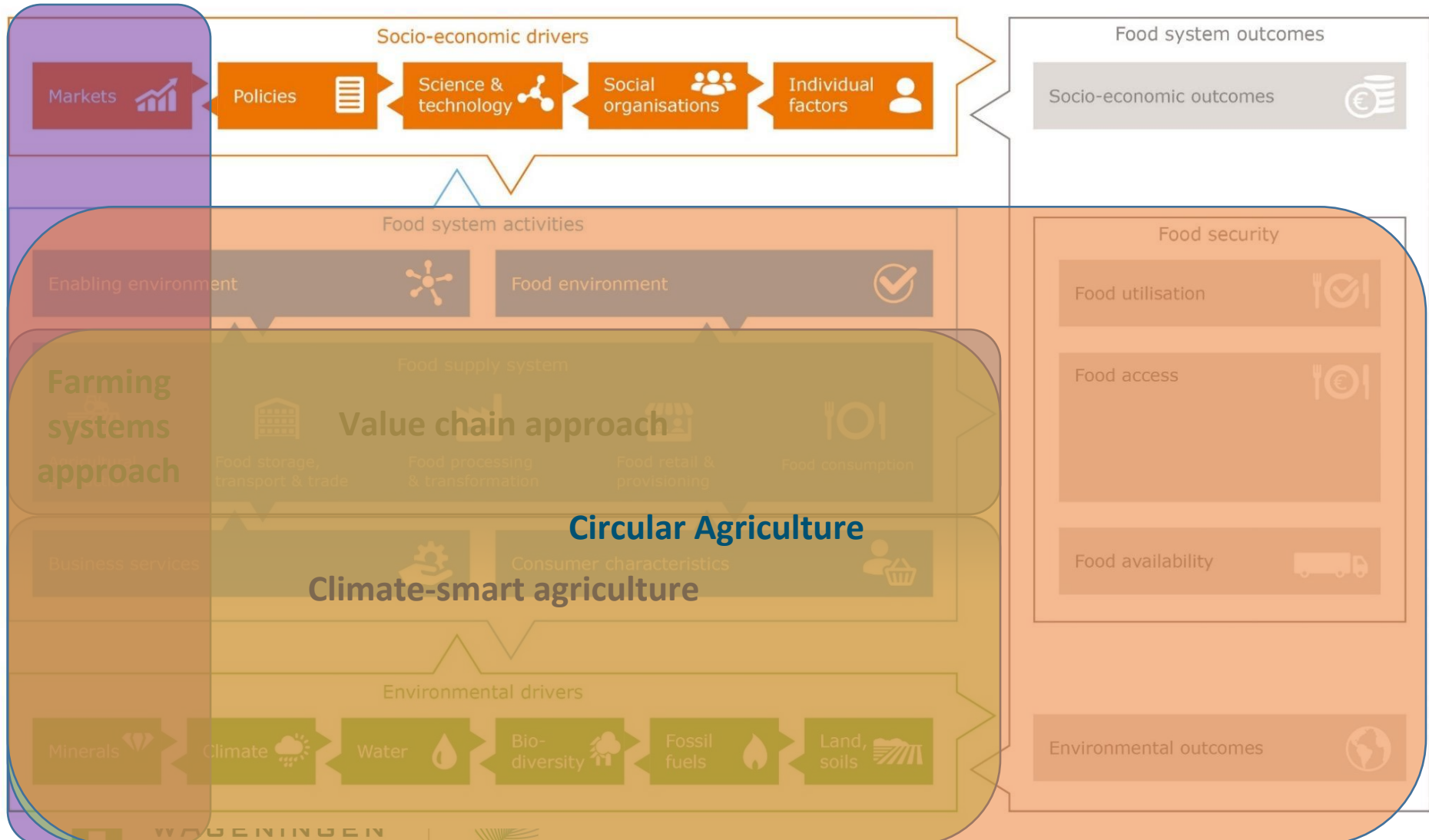
2.2 Farming system approach



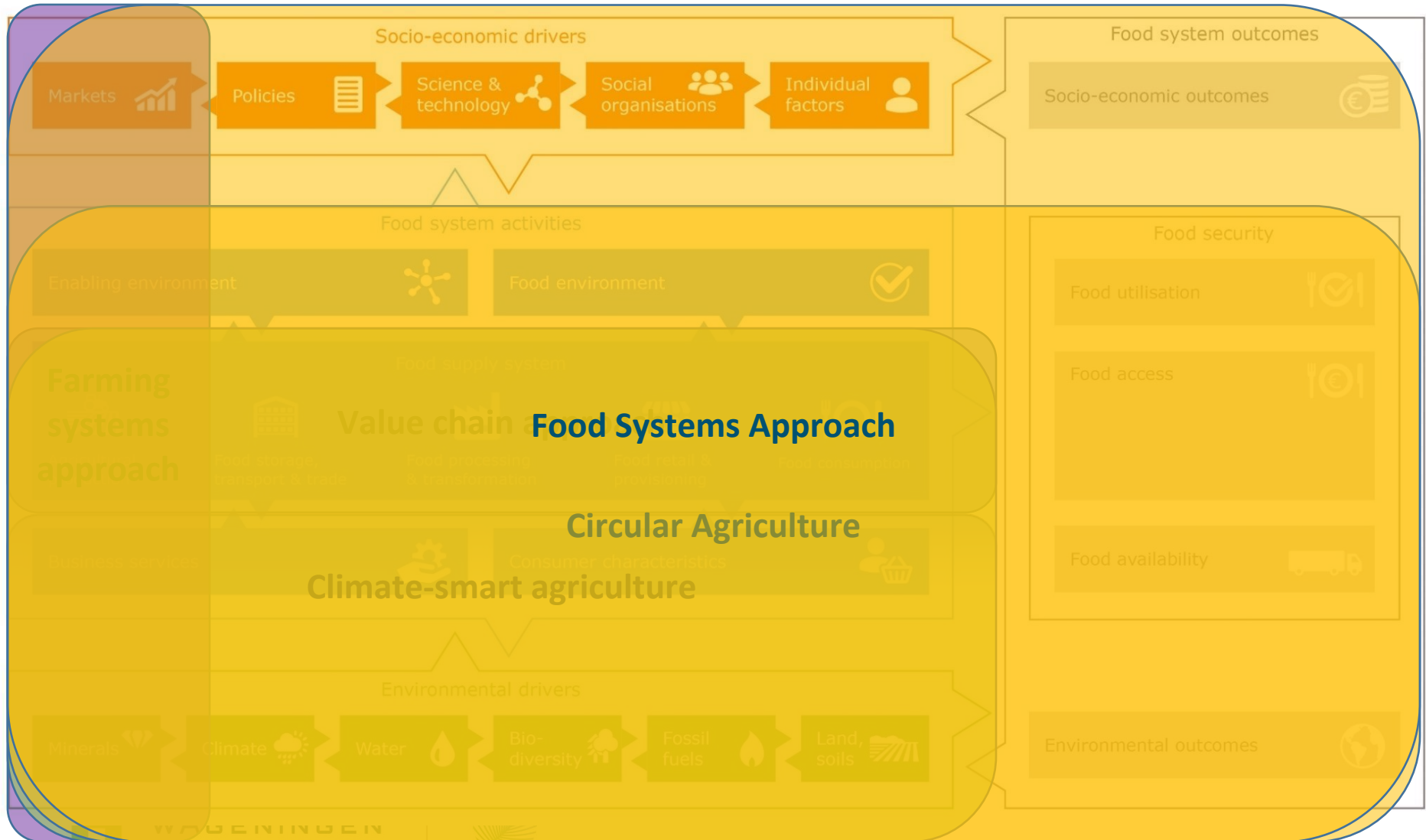
2.3 Climate-smart Approach



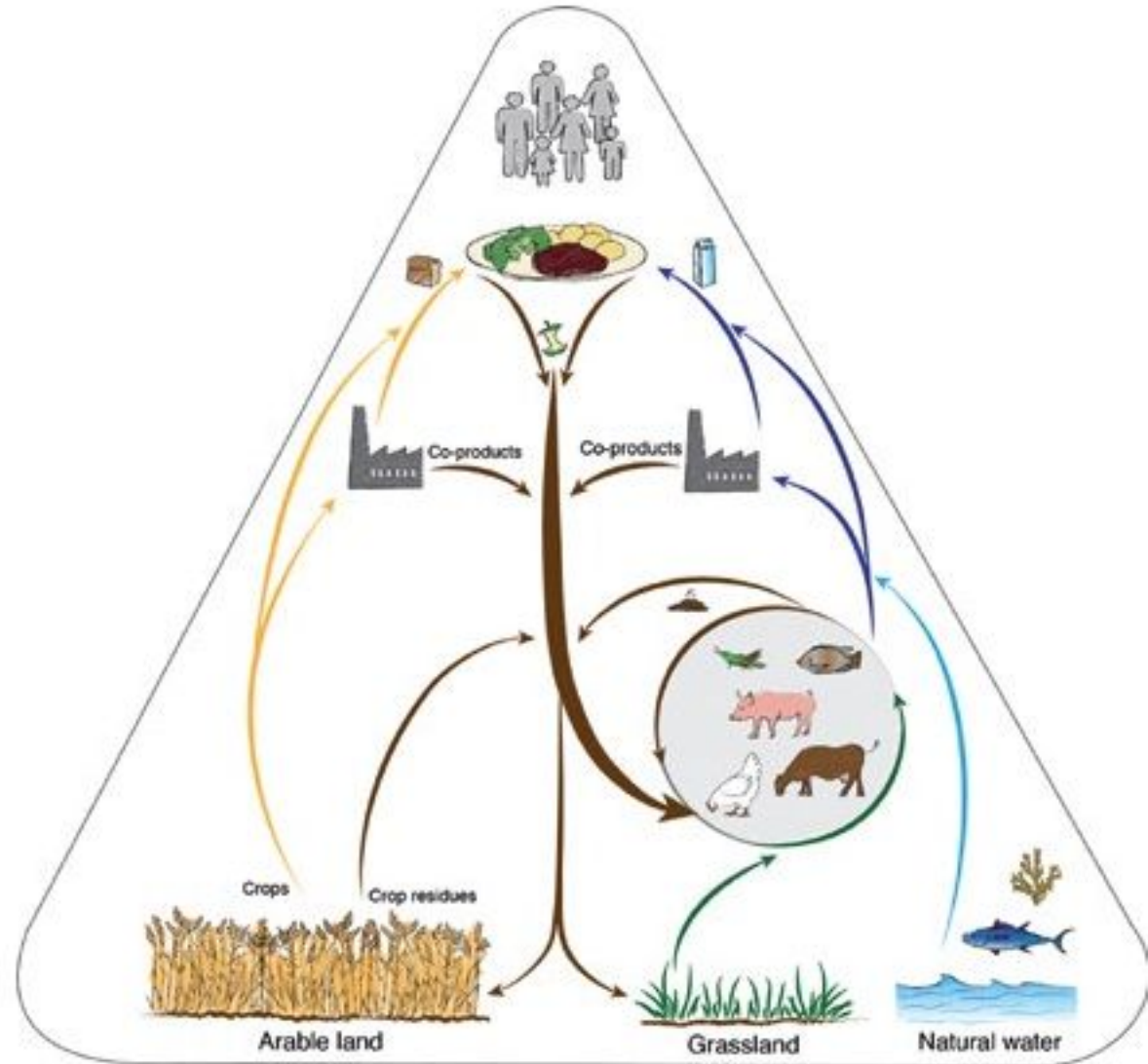
2.4 Circular Agriculture



2.5 Food-systems Approach



3. Transforming Agriculture / Food Systems



3. 1 Three principles of Circular Agricultural Food Systems

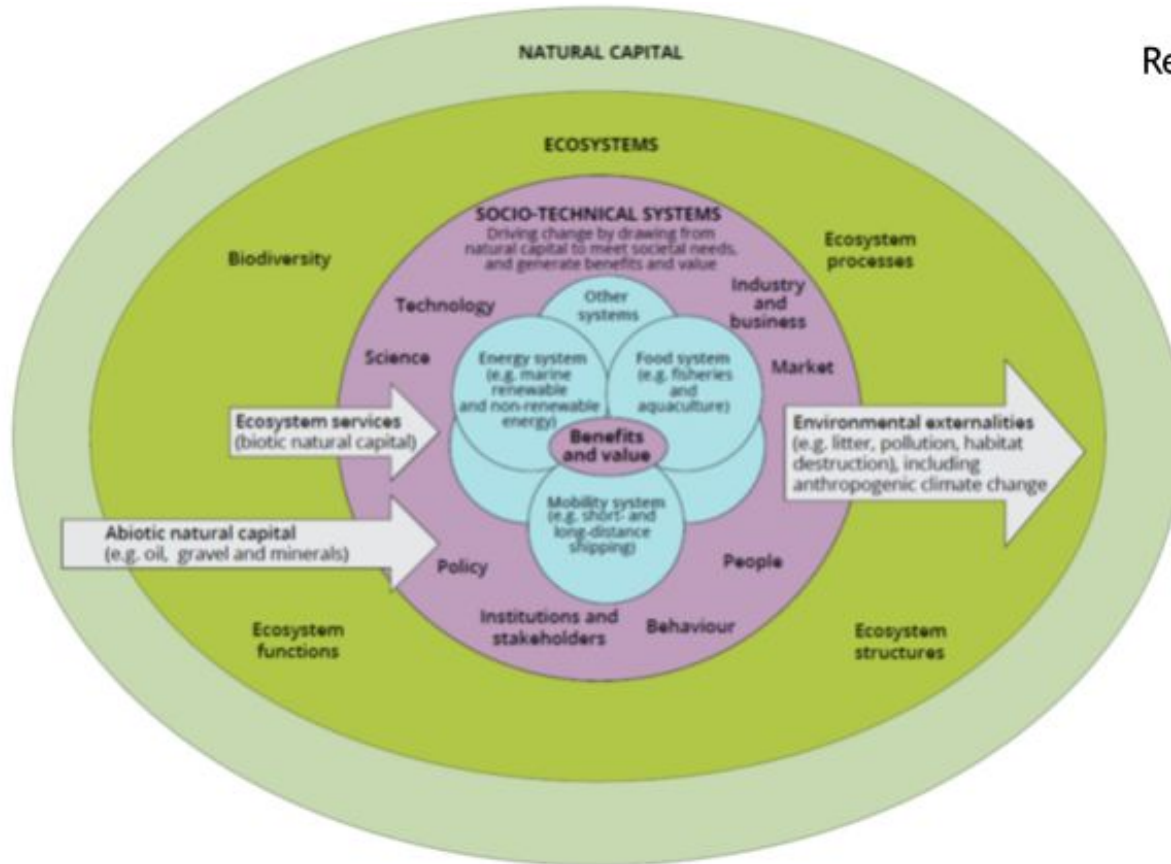
1. Plant biomass is the basic building block of food and should be used by humans first;
2. By-products from food production, processing and consumption should be recycled back into the food system;
3. Use animals for what they are good at.

3.2 Opportunities for 21st-century-thinking on circular food systems:

- Improving outcomes of the food system (higher income, nutritious diets, healthy environment)
- Address root cause of the problem
- Synergise multiple outcomes: income, nutrition and environment
- Identify solutions outside the origin of problems
- Multi-disciplinary approach: technology & behavioural change

...Aquaculture

4. Applicability to wild-caught fish



Resource use efficiency

Desired provisioning of ecosystem services (e. g. fish or more general food) or abiotic natural capital (e. g. oil or more general energy)

$$\text{Environmental Efficiency} = \frac{\text{Desired provisioning of ecosystem services (e. g. fish or more general food) or abiotic natural capital (e. g. oil or more general energy)}}{\text{Undesired environmental externalities (e.g. habitat damage, litter, pollution)}}$$

WUR Sources:

- “Circularity in agricultural production” by Imke J.M. de Boer and Martin K. van Ittersum
https://www.wur.nl/upload_mm/7/5/5/14119893-7258-45e6-b4d0-e514a8b6316a_Circularity-in-agricultural-production-20122018.pdf
- “Rethinking the international positioning of the Dutch agrofood sector” by Petra Berkhout, Siemen van Berkum and Ruerd Ruben : <http://edepot.wur.nl/449401>
- online portal “W-ARE” to be launched: Prof dr ir Geert Wiegertjes = Wageningen – Aquaculture Research & Education portal will be a central point of access to WUR’s research, chair groups, news, initiatives, programmes, facilities and teaching in the area of aquaculture
<https://www.wur.nl/en/newsarticle/Apply-the-principles-of-circular-agriculture-also-in-aquaculture-1.htm>