Needs assessment

Education in systems analysis and design

ELLS network

Aims of the needs assessment

- Understand the current state of education in systems analysis and design in the ELLS partner universities

- Assess the requirements to achieve our learning outcomes

- Identify promising opportunities
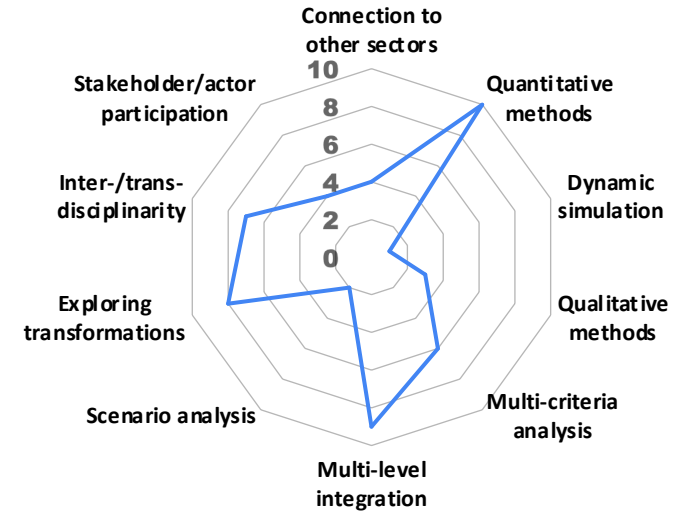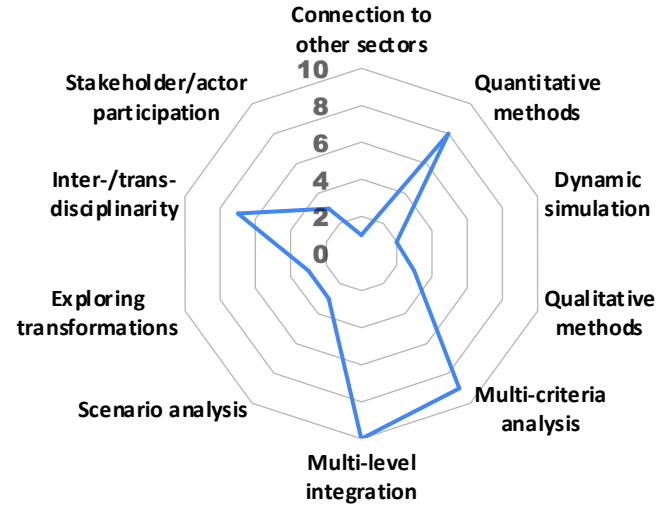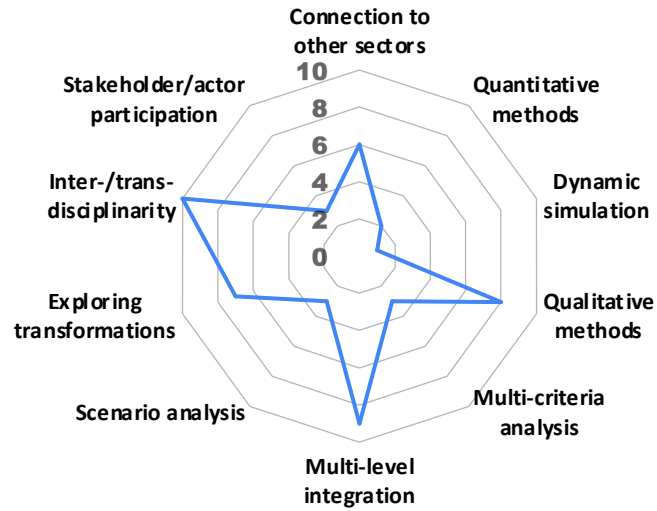
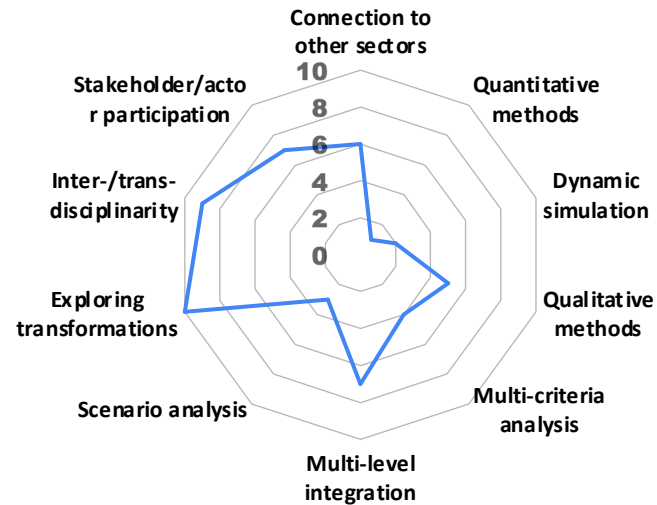| ELLS SYSTEMS Learning outcomes	
LO1	Methodologies for the **diagnosis, analysis, simulation and design** of complex systems applied to agriculture and its interface with broader food systems, generally qualified as agri-food systems (AFS).
LO2	**Future-oriented explorations** of agri-food system transitions and transformations towards resilience and sustainability using quantitative scenario-based approaches that generate information for improved management of AFS and for policymaking.
LO3	**Multi-criteria analysis** encompassing various sustainable development goals and multi-level approaches encompassing the field, farm, landscape and socio-ecosystems levels of AFS with frameworks allowing interdisciplinarity and transdisciplinarity.
LO4	**Integration of stakeholders** and their decisions in the analysis, assessment and design of innovations and transformative pathways of AFS.

Methods

- Interviews with SYSTEMS subject area steering committee members
- Inventory of courses and programs related to systems science offered at the member universities
- Survey of (MSc & PhD) students with questionnaire
- Survey of teachers with questionnaire
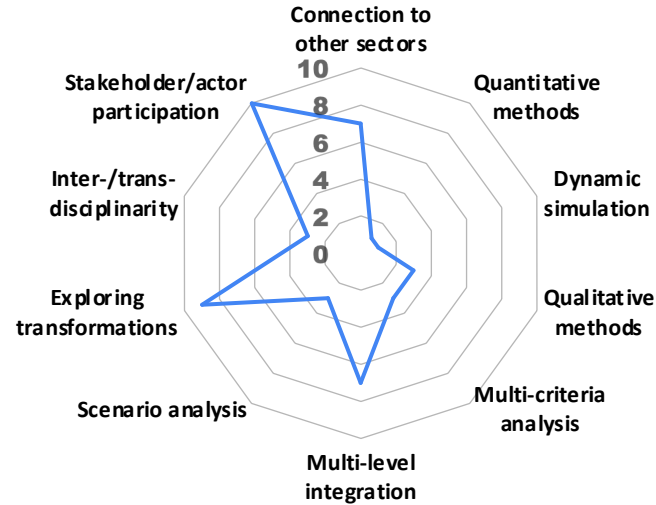
Perceived status and priority areas

Current status — MSc Students, PhD Students, Educators

Priority areas — MSc Students, PhD Students, Educators

Radar charts with axes: Connection to other sectors, Quantitative methods, Dynamic simulation, Qualitative methods, Multi-criteria analysis, Multi-level integration, Scenario analysis, Exploring transformations, Inter-/trans-disciplinarity, Stakeholder/actor participation (scale 0–10)

Gaps and challenges

Gaps in ELLS SYSTEMS learning outcomes	
LO1	• Bridging quantitative and qualitative approaches and methods • Interdisciplinary literacy and collaboration between students from different disciplines
LO2	• Skills for exploring and steering transition and transformation pathways for agri-food systems • Scenario-based approaches for exploring management and policy options
LO3	• Real-world application of multi-criteria analysis • Scaling effects and trade-offs across levels of a system
LO4	• Transdisciplinary and participatory approaches for engaging with stakeholders and actors • Exposure to real-world situations, including societal issues and dynamics

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Additional gaps and challenges

- Capacity in educators needed for systemic and transformative education
- Strategy for integrating systemic approaches in curricula
- Balancing emphasis on disciplinary knowledge versus interdisciplinary skills
- Alignment of international education programs, including language barriers
- Availability of life-long learning opportunities
- Climate-anxiety and eco-anxiety of students

Strategies for addressing the gaps

- Structure of curricula: T-shaped or H-shaped skills, double-skilled students
- Strengthening sustainability and transformation competencies through innovative teaching methods (e.g. challenge-based learning, community-engaged learning)
- Implementation of systems approaches, tools, methods in teaching
- Teachers' training and workshops ; exchange of best practices