

Introduction to learning module on **Long-term Sustainability Issues**

Anticipating & Managing Synergies and Trade-offs in Food and agricultural systems

November 2021



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems

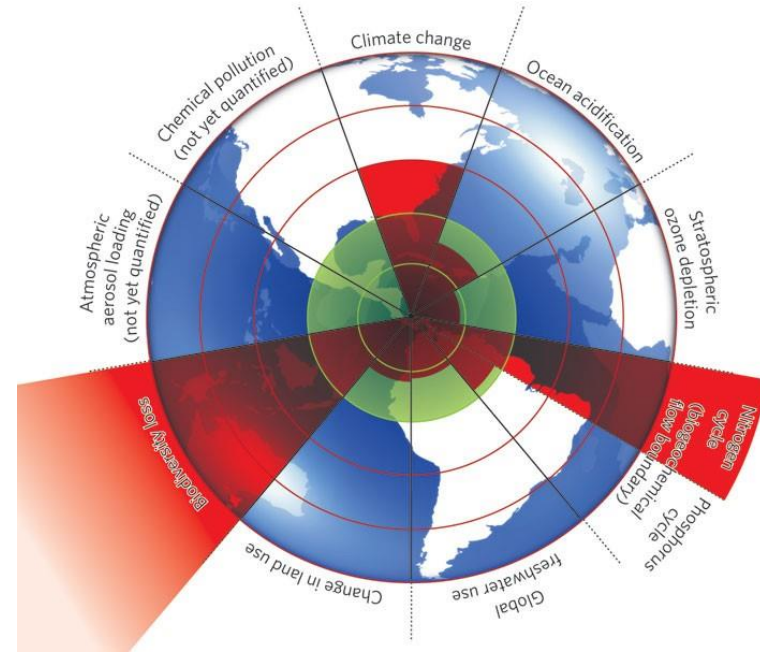


INTERACTIVE LEARNING MODULES

Synergies and tradeoffs
in food, land and water systems

Long term sustainability issues

- We are challenged to improve human wellbeing whilst remaining within ecological planetary boundaries
 - Biophysical and socio-economic sustainability issues
 - Production systems are often associated with adverse effects on
 - Environment, animal welfare, exploitive labor demands – and more



Trade-off analysis

- Often focus on trade-offs, not on synergies
- Studies done from the desks of researchers
 - Relying heavily on tools without incorporating the full complexity of factors needed for meaningful interpretation.
- Currently more emphasis and efforts to actively include community/stakeholder involvement
- **Moving forward:** extending the reach/impact of trade-off analysis



Adding value to trade-off and synergy analysis

- Discussions center around identifying trade offs
 - often at the expense of “one or the other”
- **Moving forward:** more focus on
 - managing trade-offs
 - Searching for a situation that satisfies multiple objectives instead of optimizing one
 - strengthening synergies
 - Requires systems transformation



Long-term sustainability?

- System transformation and paradigm shifts might be needed
 - for a vibrant, resilient and productive agricultural sector, and reaching the Sustainable Development Goals
 - Gender issues need to be taken into account
 - Focus on production optimization should shift towards aiming for whole-systems sustainability
 - Focus on resilience and ecosystem health

Further reading?

- Look at the learning materials in this module!
- Selected literature:
 - Scheffer, M., Brock, W., Westley, F., 2000. **Socioeconomic mechanisms preventing optimum use of ecosystem services: An interdisciplinary theoretical analysis.** *Ecosystems* 3, 451–471. <https://doi.org/10.1007/s100210000040>
 - Nyström, M., Jouffray, J.B., Norström, A. V., Crona, B., Søgaard Jørgensen, P., Carpenter, S.R., Bodin, Galaz, V., Folke, C., 2019. **Anatomy and resilience of the global production ecosystem.** *Nature* 575, 98–108. <https://doi.org/10.1038/s41586-019-1712-3>
 - Pahl-Wostl, C., 2009. **A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes.** *Glob. Environ. Chang.* 19, 354–365. <https://doi.org/10.1016/j.gloenvcha.2009.06.001>