Toward systemic social sustainability: Linking levels, contexts, and time

Nicolas J. Katzer[1] · Jesko Schulte[2] · Cecilia Braga[2] · Claudia Mair-Bauernfeind[3] · Rupert J. Baumgartner[1] · Martina Zimek[1]

[1] University of Graz, Department of Environmental Systems Sciences, Graz, Austria · [2] Blekinge Institute of Technology, Department of Strategic Sustainable Development, Sweden
[3] Technical University of Applied Sciences Rosenheim, Faculty for Chemical Technologies and Economy, Germany

1. Background and Purpose

- Product development decisions are embedded in a broader social system: organisational, sectoral and societal levels, multiple contexts, and short- to long-term horizons.
- Many social sustainability-related frameworks exist. However, unlike environmental assessment which consolidated around biophysical causation, social sustainability lacks an agreed *systemic* structure linking micro-level decisions to that system.
- **Illustrative case:** a gardening glove made in Portugal. Should the simple PET glove (€7; worn out within 3 weeks, weekly replacement recommended) give way to a repairable plant-based leather alternative lasting over a season (€30)?

Systemic (Zimek & Baumgartner, 2024): improving first-order performance (narrow efficiency within the system of interest) does not automatically improve second-order performance (effectiveness at the level of society and nature).

Aim: To structure existing approaches across levels, contexts, and time horizons, providing a first foundation for linking product development decisions to systemic social implications.

2. Methods

Critical interpretive synthesis (Dixon-Woods et al., 2006) in three steps.

1. **Literature review and sampling.** Purposive cross-disciplinary sample of 19 frameworks (psychology, governance and institutional theory, socio-technical transitions, ecological economics, life cycle assessment), identified by database search and citation snowballing; included if they explicitly structure the social dimension.

2. **Characterization.** Deductive coding against an a priori frame, how the social system is partitioned into levels, which contexts are addressed, whether temporal horizons are explicit. Coded by the first author, reviewed to consensus with co-authors.

3. **Interpretive synthesis and illustrative application.** Frameworks placed on a continuous level × context plane (Figure 1); extents are interpretive codings, not categories claimed by the original authors. The corresponding research streams then summarized regarding strengths and limitations (Table 1) and the insights applied to an illustrative micro-level case: a gardening-glove redesign traced through the use phase as a causal-loop diagram of direct and indirect effects.

3. Results: Mapping social sustainability approaches

None of the 19 screened approaches alone links product decisions to systemic social implications.

To assess the systemic social implications, an agreed structure of the social system itself is required. The screening therefore asked how existing methodological research streams approach and assess social sustainability (Table 1) and how their corresponding frameworks cover and partition the social system (Figure 1). Both are read against the **glove case**.

Table 1: Summary of screened frameworks and corresponding methodological research streams.

Research streams	Strengths	Limitations
Product- and value-chain (S-LCA)	Hotspot identification, supplier risk screening	Data sparsity, weak systemic feedback
Principles-based (FSSD)	Theoretical coverage	Causal implications across contexts and levels
Normative-individual (capability, basic needs)	Ethical depth, well-being orientation	Resists operationalisation in design
Macro-threshold (Doughnut, SDGs)	Benchmarking and reporting	Detached from product-level causal implications
Justice- and participation-oriented	Procedural and distributive richness	Resists standardisation

Main takeaways of screened research streams:

- Level counts range from two to four; roughly half state levels explicitly, the remainder implicitly.
- Boundaries differ in kind, not only in resolution.
- Levels are anchored to different objects: needs, actors, institutions, or socio-technical configurations.

What Figure 1 shows:

- Coverage crowds in the community-to-company range and central contexts, but thins toward individual or global levels, as well as very tangible or intangible contexts.
- Individuals' coverage overlap, but their boundaries do not align; overlap is not convergence.
- All address multiple levels and contexts; none systemically links micro-scale decisions to systemic implications.

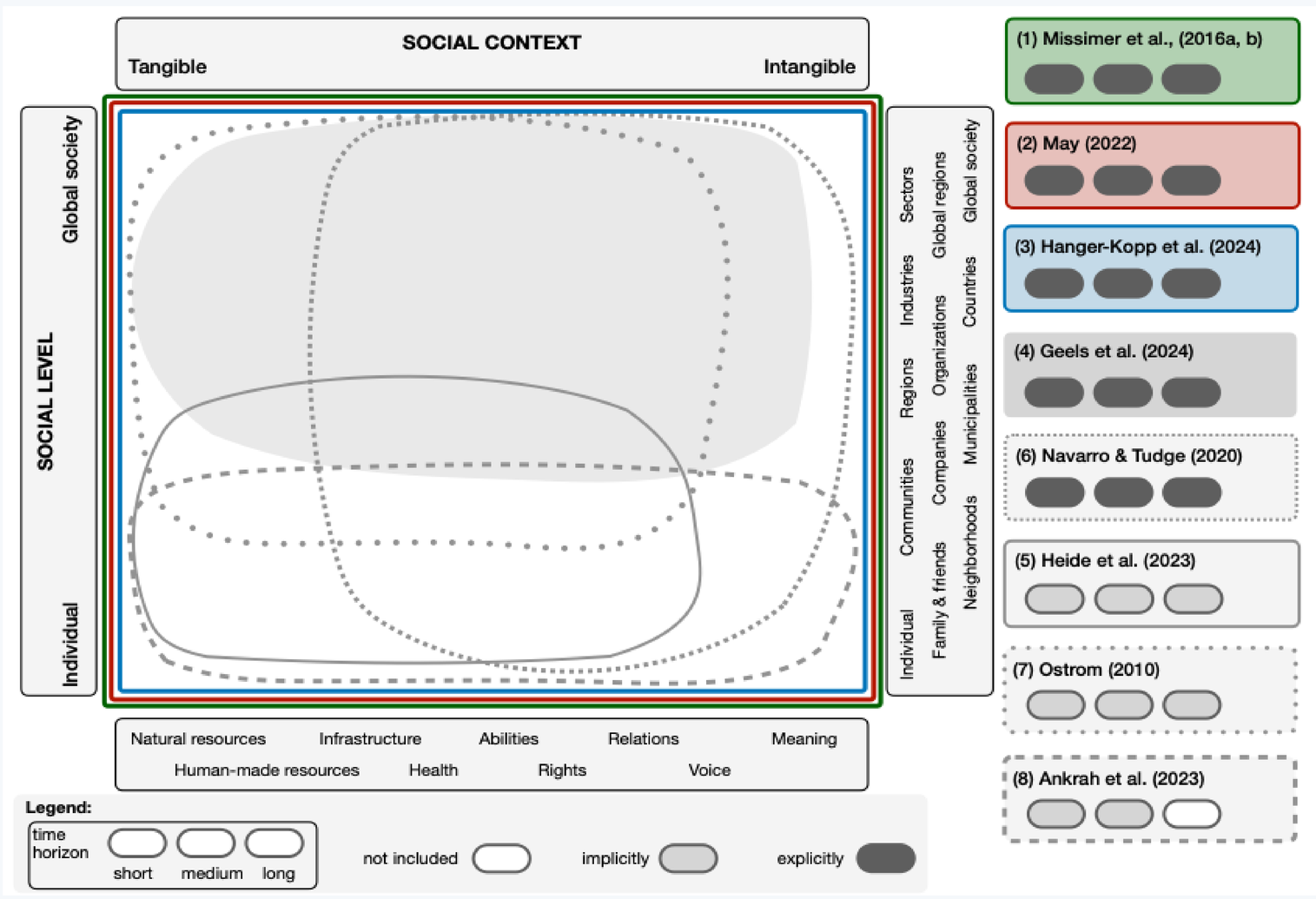

Figure 1: Presentation of 8 out of 19 screened frameworks across social levels and contexts; extents assigned by the authors. Geels, Heide and Navarro & Tudge are highlighted as exemplary contrasting cases; frames (grey) specify dimensions of assessment without partitioning the system. For the full list of the 19 screened frameworks, see the link in the references below.
How to read: vertical axis is social levels, continuous and without a fixed taxonomy; horizontal axis is social contexts, from tangible to intangible. Dots at each reference mark which of the short- (<5 years), medium- (5-25 years) and long-term horizons (>25 years) it implicitly or explicitly addresses.

Even combined, the research streams and frameworks screened form only a partial scaffold. None spans gardeners' protection, glove-making work in Portugal and textile-waste burden, and none handles their different horizons to systemically assess how to design the glove.

4. Discussion

Frameworks disagree on how many levels the social system has, where boundaries fall, and when contexts relate to each other. Overlapping coverage is therefore not convergence.
Two patterns recur: frameworks either partition the social system narrowly but incompletely or specify dimensions of assessment without causal cross-level and –context implications.

In the **glove case** (Figure 2), one design decision runs into two systemic social implications during use: durability lowers cost per season, improves personal protection and minimizes waste, while the higher upfront price excludes low-income gardeners. Also, the glove-making work in Portugal changes with the new production processes and technologies. No screened approach holds both ends.

Limitation: an exploratory screening, not a systematic review, other experts would potentially derive different systemic social implications. Additionally, complementary frameworks likely exist outside those covered.

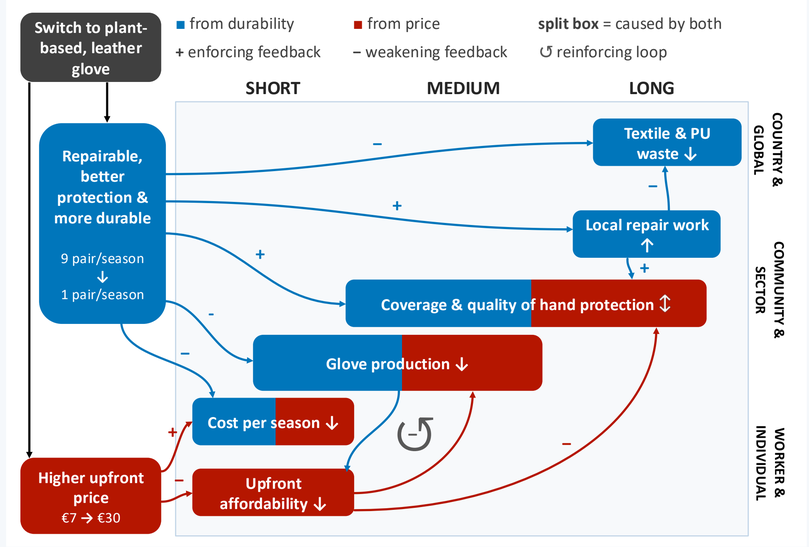

Figure 2: Illustrative case: replacing a simple €7 PET gardening glove with a €30 repairable plant-based leather alternative made in Portugal. Direct and indirect effects by level × time horizon.

5. Outlook and call to collaborate

A systemic social sustainability assessment would need to:

position and complement existing approaches across levels, contexts and temporal horizons rather than replace them

- make cross-level and cross-context implications visible, and handle normative references explicitly
- for the **glove case**, hold upfront affordability, cost per season, and effects on work and waste in one frame

We are looking for collaborators. An invitation to interdisciplinary methodological dialogue. Please contact us:

Nicolas J. Katzer, MSc: nicolas.katzer@uni-graz.at
Martina Zimek, PhD: martina.zimek@uni-graz.at

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Link to the full list of the 19 screened frameworks:
https://drive.google.com/file/d/1pEFt4u1yzkKuoTWn_hRjjZSnbxJ90pku/view?usp=share_link.

Department of Environmental Systems Sciences
University of Graz

Email: nicolas.katzer@uni-graz.at,
Web: circular.uni-graz.at