

Is it always clear what 'good quality' is? – Value choices in quality management

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What is quality?

***Do we all agree on quality characteristics
and priority of these characteristics?***

Probably yes, most of the time.
But there are value-laden and controversial elements.

For example in system scoping:

Lean systems: E.g. inventorying well known and popular processes and effects (e.g. only air emissions of CO₂, NO_x, SO₂ from fuel use)

Full systems: Assessing systems in depth, including 'far-background' processes, auxiliary materials and exotic pollutants.



Control vs. Curiosity

- Lean system**
- System parts and effects are well known and 'popular'.
 - Focus on 'known knowns' (WYKIWYG)
 - Quite predictable, usually unsurprising results.

- Full system**
- Effort on extensions to reduce unknowns.
 - Gain of new knowledge.
 - Surprises are possible.
 - Hitherto unknown or unexpected effects could become detected as important.



Is complexity a good thing?

- Lean system**
- Reduced system complexity with low to moderate inventory workload
 - Streamlined system = many *intentional* data gaps

- Full system**
- Complex system with high inventory workload
 - Data gaps minimised
 - Often larger uncertainty in results



Closure vs. Completeness

- Lean system**
- Few or no data gaps (except the intended ones)
 - High risk of burden shifting (stakeholders replace the assessed burdens with the not-assessed ones)

- Full system**
- Some data gaps filled, many remain.
 - Every result is always 'preliminary' as more data might be added.
 - Precautionary principle of heeding every burden.
 - Lowers the risk of burden shifting *

* *The major reason to assess life cycles in the first place*



Lean vs. full systems

Every LCA system is inherently complex:

How do we deal with that complexity?

- Do we cut down complexity by focussing on the well-known, 'popular' system parts?
- How can we know that the 'popular' system parts are the relevant ones for the assessed process?

Two 'archetypes' for these questions:

Conservative: favours lean systems and popular processes

Progressive: favours full systems, curious disposition



Conservative review outcomes

A Conservative reviewing a lean system LCA

- **"complete"** all of the few pre-set emissions are recorded
- **"low uncertainty"** because system complexity was reduced

A Conservative reviewing a full system LCA

- **"incomplete"** data gaps for a lot of emissions
- **"high uncertainty"** because system is complex and also unpopular or speculative effects are included



Progressive review outcomes

A Progressive reviewing a lean system LCA

- **"incomplete"** a lot of pollutants are intentionally missing
- **"results questionable"** for environmental decision making because burden shifting is possible → higher "decision uncertainty"

A Progressive reviewing a full system LCA

- **"as complete as possible"** a lot of pollutants are heeded according to available sources
- **"results suitable"** because risk of burden shifting is lowered. Priority of avoiding data gaps/burden shifts over result value uncertainty.



Concluding remarks

- The foremost quality of LCA studies is that they try to create a **synoptic view** of the burden potential of the assessed processes
- The prime motivation for this synoptic effort is the **avoidance of burden shifting** from LCA-based decisions
- Intentionally cutting down this synoptic complexity might be a **pragmatic short-cut**, but clashes with the prime motivation
- Completeness produces complexity, which tends to lead to **larger uncertainty** and variability in result values (Min-Max ranges)
- Data gaps raise "**decision uncertainty**", but without leading to any quantitative signals in the result and nothing to perceive.



Thank you for your attention

