10 gaps and assumptions in mainstream assessments of pastoralism

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DATA

1. **BIASES IN THE DATA:** The majority of LCA analyses make use of data from high-income countries, mostly Europe and North America, and some parts of Latin America. These are predominantly industrial systems. There is a severe lack of data for low- and middle-income countries, especially from extensive pastoral settings. This means that most assessments are not 'global' as claimed, but instead are quite partial.

2. **DEFAULT EMISSIONS FACTORS:** The lack of empirical data collected for low- and middle-income regions means that many studies use default emissions factors calculated by the IPCC to estimate emissions produced by livestock in these areas. Recent studies have shown that these default figures overestimate actual animal emissions in extensive low-input systems. Generalising from high-input industrialised systems (where the data lies) to the rest of the world can result in hugely misleading results.

3. **GHG MEASURES:** In order to assess the emissions across a number of GHGs (CO_2, CH_4, N_2O), a standard unit is required. Conventionally this has been measured in terms of CO_2 equivalence, with equivalence assessed in relation to 'global warming potential'. The factor used in this calculation may overestimate the influence of methane due to its short half-life in the atmosphere. Methane production by livestock also varies dramatically depending on feed intake and genetics. Current estimates used in LCA models may significantly overestimate methane production for pastoral livestock.

SYSTEMS

4. **CONCEPTUALISING 'EFFICIENCY':** The mainstream framing of efficiency prioritises the maximisation of output per animal, with impacts linked to emissions per unit of product (meat or milk). Extensive systems are deemed the least efficient, although they productively make use of areas that have limited alternative uses. Wider systems-level assessments are required to capture multi-functional uses of livestock and diverse impacts.

5. **LIVESTOCK AND THE CARBON CYCLE:** LCA methodology assumes that the soil carbon balance is in long-term equilibrium, and that the presence of livestock adds extra emissions. However, in low-input pastoral systems, recent studies have shown that the presence of livestock can keep the carbon cycle balanced, or even slightly negative. Carbon sequestration in rangelands is shown to be significant under certain grazing conditions, including light grazing in extensive, mobile systems.

6. **SPATIAL AND TEMPORAL DYNAMICS:** Making an aggregate assessment of impacts misses important patterns of spatial heterogeneity and temporal variability. Emissions may be positive and negative in the same area at different times, requiring much more focused mitigation measures.

7. **ECOSYSTEM SERVICES:** Bounded farm-level LCA assessments often do not recognise that livestock, particularly in low-input, pastoral systems, offer important ecosystem services that maintain the landscape, the water cycle and biodiversity, while also reducing the environmental risks of fire, flooding, etc.

BASELINES AND ALTERNATIVES

8. **ALTERNATIVE LAND USES:** An assumption of many LCA assessments is that the abandonment of livestock rearing – especially extensive systems – would result in beneficial, 'land-sparing' rewilding/regeneration of the land, allowing more effective carbon sequestration. If not, tree-planting initiatives are frequently envisaged as an alternative to livestock production. Increases in crop farming to produce plant-based alternatives to animal protein also have major consequences. However, studies have shown how grasslands, due to extensive root systems, may have higher carbon sequestration potentials than trees and less vulnerability from wildfires, and tree-planting schemes have very often failed in harsh dryland and montane environments.

9. **NICHE REPLACEMENT:** In reducing extensive livestock-based land use, the alternative will not just be a vegetation carbon sink. The niche left by livestock would likely be filled by wild ruminants and termites, with potentially significant effects on the landscape and carbon emissions. The pre-livestock baseline of wildlife-based landscapes is likely to have had high carbon emission levels, perhaps comparable to that of extensive livestock systems.

10. **CONSUMER CHOICE AND DIETARY PATTERNS:** Hypothetical dietary scenarios in LCA studies often assume meat will be replaced with low-emitting, high-yielding alternatives. However, this does not usually match realistic consumer choice, dietary patterns and bioavailability of nutrients. Alternatives based on industrial meat or milk substitutes may have significant environmental impacts, alongside the further concentration of power in the food system.

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A report and set of briefings warns that the dominant picture of livestock's impacts on climate change has been distorted by faulty assumptions that focus on intensive, industrial farming in rich countries. Millions of people worldwide who depend on extensive livestock production, with relatively lower climate impacts, are being ignored by debates on the future of food.

Resource type

Infographic