

GIMO RECOMMENDATIONS

October 3rd 2018

Empowering decision makers across the value chain to protect and restore life on land – Directions for enhancing LCA impact modelling to better address impacts on biodiversity

Preamble

ACE, the Alliance for Beverage Cartons and the Environment, gathered a multi-disciplinary group of international experts in forestry, ecosystem science and life cycle assessment in Gimo, Sweden from the 1st to 3rd of October 2018. The 3 days' workshop was dedicated to discuss how life cycle assessment (LCA) can better address land use impacts on biodiversity – supported by a forest visit to study responsible forest management.

The workshop participants developed the “Gimo recommendations” by considering the specific case of the forestry value chain in boreal zones ensuring protection and restoration of life on land.

The “Gimo Recommendations” as follows are intended to be a useful tool for anyone seeking to better recognize responsible forest land management techniques in decision-making, building on Life Cycle approaches, be it academics, NGOs, Policy-makers, Industry.

This approach is suggested to also be applicable to other ecosystems and value chains.

Acknowledgement

We acknowledge that

- LCA is a method to assess the environmental performance of product systems and services supporting decision making for companies, policy and consumers. LCA is not a tool to replace effective land management approaches on any scale
- Modelling choices in LCA depend on the intended application including the decision context
- Biodiversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems [Convention on Biological Diversity, CBD]
- Biodiversity impacts can be measured along the cause-effect chain and can be represented in LCA as a midpoint or endpoint indicator depending on the way they are measured.
- Measuring impacts requires a reference situation which involves value choices related to the way we see ecosystem's quality and its protection. Choosing the appropriate reference can have a strong impact on the results.
- Responsible land management practices exist to achieve healthy ecosystems as suggested e.g. in SDG 15.

The recommendations build on respective guidance from UNEP/SETAC and ISO 14040

We identified the following areas as useful outcomes to improve decision support via LCA – without claiming completeness:

The Recommendations

LCA has the potential to support multi-attribute decision making – the type that is needed to navigate the complexity of the Sustainable Development Goals (SDGs), we believe that LCA can be improved to better direct decision making towards a better protection of life on land (SDG15).

Life Cycle information addressing biodiversity should **drive decisions** across the value chain **that restore and protect biodiversity-related outcomes** including the ones for which society has already set targets as in the SDGs, Science Based Targets (SBTs), etc.

Reference situation

Different types of reference situations can be chosen depending on the intended application (potential natural vegetation, current land use, barren land). Depending on the intended application (product improvement/product comparison) the choice needs to be substantiated.

Choice of a reference state is moot (not critical) when working within a system. The potential natural vegetation (PNV; hypothetical natural status of vegetation that could be identified by taking away human impact on vegetation¹) is a conventional setting commonly serving as default and for benchmarking between systems. When choosing PNV as a reference care should be taken not to incentivize deforestation.

In the future, decision support could benefit from alternative science based and socially agreed targets for sustainable land use in order to achieve protection of life on land and provision of ecosystem services for humans (within planetary boundaries). In particular, forest land can be used and developed non-exclusively while providing valuable ecosystem services.

Appropriate spatial granularity for addressing forest land

Effective land management approaches that are maintaining ecosystem health consider landscapes which comprise the main features that are relevant to deliver habitat quality. Such landscapes may be smaller than e.g. an ecoregion but are usually larger than the activity area under study (e.g. a stand or plot).

While inventory data should be established on stand level, a meaningful aggregation is the level of forest management unit (possibly including area of operational influence) to establish a direct link to decisions. Higher aggregation can deliver value to landscape management approaches but also bears the risk to smooth out impacts in one area with benefits for another.

¹ Curran MP, Maia de Souza D, Antón A, Teixeira RFM, Michelsen O, Vidal-Legaz B, Sala S, Milà i Canals L (2016) How well does LCA model land use impacts on biodiversity?—A comparison with approaches from ecology and conservation. *Env Sci Technol* 50(6), 2782–2795 DOI: 10.1021/acs.est.5b04681

The impact assessment method would best relate the inventory data to the landscape in which it is nested, the ecoregion in which the landscape is nested, and the biome in which the ecoregion is nested.

The range of different management regimes (e.g., effects of responsible forest management standards) yield useful information on biodiversity impacts or conditions.

It needs to be ensured that essential aspects like connectivity and fragmentation are considerations that are addressed within the management standards qualifying for being used to address ecosystem health.

Impact modelling should account not only for the area allocated to management or set asides but also for the different quality of set asides including connectivity/fragmentation.

The spatiotemporal scale is important and the biodiversity models should include the effects on biodiversity during the whole rotation period and on a landscape scale.

Providing better decision support

It is important and valuable for unit process life cycle inventory data to reflect drivers of outcomes and change; this includes information about forest management practices and certification status.

Outcome measures from life cycle impact assessment (LCIA) of biodiversity should take into account expected changes in species richness (and vulnerability), mean species abundance (MSA) and functional diversity.

A panel procedure with experts, industry and NGO representatives could help to collate appropriate inventory data and develop characterisation factors, recognizing management practices (such as proportion of set aside, quantity of deadwood retention etc.) and corresponding land use types, and recognizing ecosystem context. Such a panel could also be developed for different regions of the world.

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Please note that this recommendation has been co-authored by the individuals listed here in personal capacity. Their endorsement does not constitute endorsement by their respective institutions.

The recommendations are available at:

http://www.beveragecarton.eu/uploads/Modules/Publications/gimo_recommendations.pdf