



# Overview of Social Life Cycle Assessment

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# Outline

- Introduction
- Goal and Scope Definition
- Life Cycle Inventory Analysis
- Life Cycle Impact Assessment
- Future research needs

# Introduction

- Sustainable development: environmental, social and economic
- SLCA evaluates the **positive** and negative social and socio-economic impacts along the product life cycle
- SLCA vs. Other social impact assessment tools: objective, scope
- Milestone documents of SLCA – the Guidelines, Methodological Sheets
- SLCA is in line with ISO14040 and ISO14044, and it can be applied by itself or combined with LCA

# Goal and Scope Definition

The ultimate objective for conducting a SLCA is to promote improvement of social conditions and of the overall socio-economic performance of a product throughout its life cycle for all of its stakeholders.

- **Functional Unit**

- The conflicts between 'company perspective' and FU; Difficulties of expressing results in FU

- **System Boundaries**

- Upon ELCA? The parts that company can influence directly?

- **Area of Protection**

- i.e. human well-being

Stakeholder categories	Impact categories	Subcategories	Inv. indicators	Inventory data
Workers	Human rights	■		
Local community	Working conditions	■		
Society	Health and safety	■		
Consumers	Cultural heritage	■		
Value chain actors	Governance	■		
	Socio-economic repercussions	■		

Source: UNEP/SETAC, *Guidelines for Social Life Cycle Assessment of Products*, (2009), Page 45

# Subcategories included in the stakeholder “worker” and “local community”

Stakeholder categories	Subcategories
Stakeholder “worker”	<ul style="list-style-type: none"><li>• Freedom of association and collective bargaining</li><li>• Child labour</li><li>• Fair salary</li><li>• Working hours</li><li>• Forced labour</li><li>• Equal opportunities/discrimination</li><li>• Health and safety</li><li>• Social benefits/social security</li></ul>
Stakeholder “local community”	<ul style="list-style-type: none"><li>• Access to material resources</li><li>• Access to immaterial resources</li><li>• Delocalization and migration</li><li>• Cultural heritage</li><li>• Safe &amp; healthy living conditions</li><li>• Respect of indigenous rights</li><li>• Community engagement</li><li>• Local employment</li><li>• Secure living conditions</li></ul>

# Life Cycle Inventory Analysis

- **Data type**
  - more use of qualitative and semi-quantitative data
- **Objective data vs. Subjective data**
  - SLCA does not favor objective data
- **Generic data and site-specific data**
  - hotspot assessment with generic data combined with site-specific assessment
- **Social Hotspot Database (SHDB)**
  - based on GTAP Global input-output modeling; Social Theme Tables and Worker Hours Model

# Life Cycle Impact Assessment

No specific LCIA methods are recommended in the Guidelines. As classified in the Guidelines, there are generally two types of LCIA methods in SLCA:

- **Type 1 sLCIA methods**
  - Performance Reference Point: do not use causal-effect chains
- **Type 2 sLCIA methods**
  - Inventory data are aggregated to a midpoint or endpoint level through causal-effect chain modeling



# Exemplary methods: Type 1

Method	Score Level	Aggregation Level	Weighting Based on	Product System Specification
Hsu et al. 2013	Multi-level	Subcategory	Relevance weighting	General
Aparcana and Salhofer 2013	Two-level (1 or 0)	Subcategory	No weighting	Recycling system in low-income countries
Foolmaun and Ramjeeawon 2013	Two-level (yes or no)	Final single score	Equal weighting	EoL of PET bottles
Manik et al. 2013	Multi-level	Final single score	Panel weighting	Palm oil biodiesel system in Indonesia
Hutchins and Sutherland 2008, part 2	Multi-level	Final single score	Panel weighting	General
Franze and Ciroth 2011	Multi-level	Subcategory	No weighting	General
Ciroth and Franze 2011	Multi-level	Impact categories	Equal weighting	General
Hosseiniyou et al. 2013	Multi-level	Impact categories	Panel and equal weighting	Materials comparison
Martínez-Blanco et al. 2014	Multi-level	<i>Subcategories</i>	No weighting	Fertilizer alternatives
Ekener-Petersen and Finnveden 2013	Multi-level	Subcategories	No weighting	General

**Note:** This table is adapted from **Table 2.** of '**Social Life Cycle Assessment Revisited**' (Wu et al., 2014)

# Exemplary methods: Type 2

Framework/method	Impact Pathway(s)	Causal Relationships	Midpoint vs. Endpoint	Normalizing, Weighting
Feschet et al. 2013	Single	GDP per capita to life expectancy	Endpoint only	No
Norris 2006, part 1	Single	GDP per capita to life expectancy	Endpoint only	No
Hutchins and Sutherland 2008, part 1	Single	GDP per capita to infant mortality	Endpoint only	No
Dreyer et al. 2006	Multiple	Not specified	Midpoint and endpoint	Not specified
Weidema 2006	Multiple	Dozens of impact pathways	Midpoint and endpoint	Global normalization; Monetization weighting
Hunkeler 2006	Multiple	Carrying out of unit process to labor hours to affording social needs	Midpoint only	Egalitarian (equal) weighting for each impact category
Jørgensen et al. 2010	Multiple	Non-production to decrease in labor demand to unemployment to health; poverty; family tension; violence and crime	Not specified	Not specified

**Note:** This table is adapted from **Table 3.** of '*Social Life Cycle Assessment Revisited*' (Wu et al., 2014)

# Future Research Needs

- Development of database
- Guidance on collecting site-specific data
- Merging Type 1 and Type 2 LCIA methods
- Standardizing LCIA methods
- Integration of top-down and bottom-up approaches
- Which kind of outputs could SLCA generate, and how to use SLCA results in decision support

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