Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Application of S-LCA: From artisanal mining to complex products


© B.Litsani 2010

© http://www.teluglobe.com/inthenews/business


© Öko-Institut 2010

Siddharth Prakash, Öko-Institut e.V.

Berlin, 25.05.2012

Workshop: Practical Aspects of Social Life Cycle Assessment

Contents

- Introduction Öko-Institut e.V.
- Example 1: Cobalt Mining in D.R.Congo
- Example 2: Notebook Production in China
- Example 3: E-Waste Management in Ghana
- Methodological Approach
- Methodological Lessons
- Conclusions

Introduction Öko-Institut

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

The Öko-Institut is a leading European research and consultancy institution working for a sustainable future. It is a value driven non-profit-organisation and employs more than 140 staff at three locations: Freiburg, Darmstadt and Berlin. Annually, Öko-Institut carries out about 200 national & international projects.

The Öko-Institut specializes in following areas:

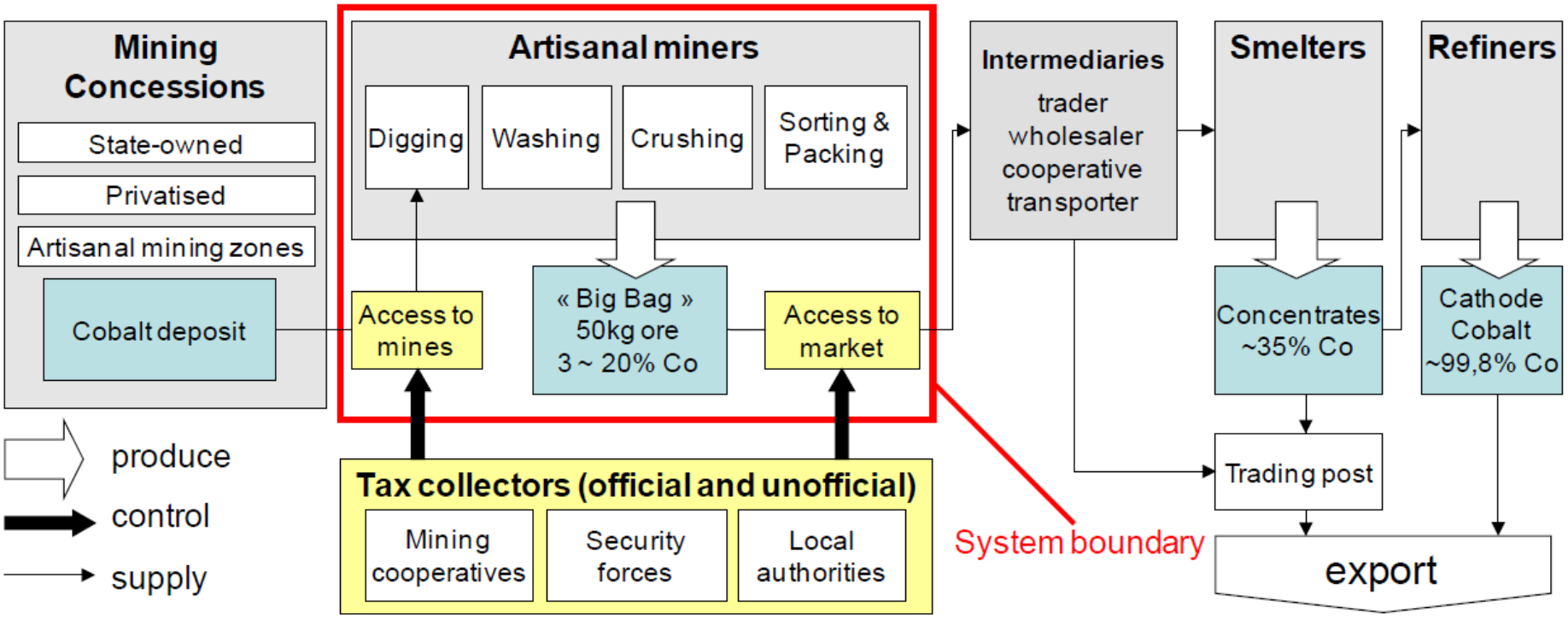
- Chemicals Management & Technology Assessment
- Energy & Climate
- Nuclear Engineering & Facility Safety
- Sustainable Consumption, Mobility, Resource Economy & Enterprises
- Environmental Law, Policy & Governance
- Agriculture and Biodiversity



Example 1: Cobalt Mining in D.R.Congo

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Social Impacts of artisanal cobalt mining in Katanga, Democratic Republic of Congo, Öko-Institut e.V., 2011



Example 2: Notebook production in China

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Social impacts of the production of notebook PCs, Öko-Institut e.V., 2006

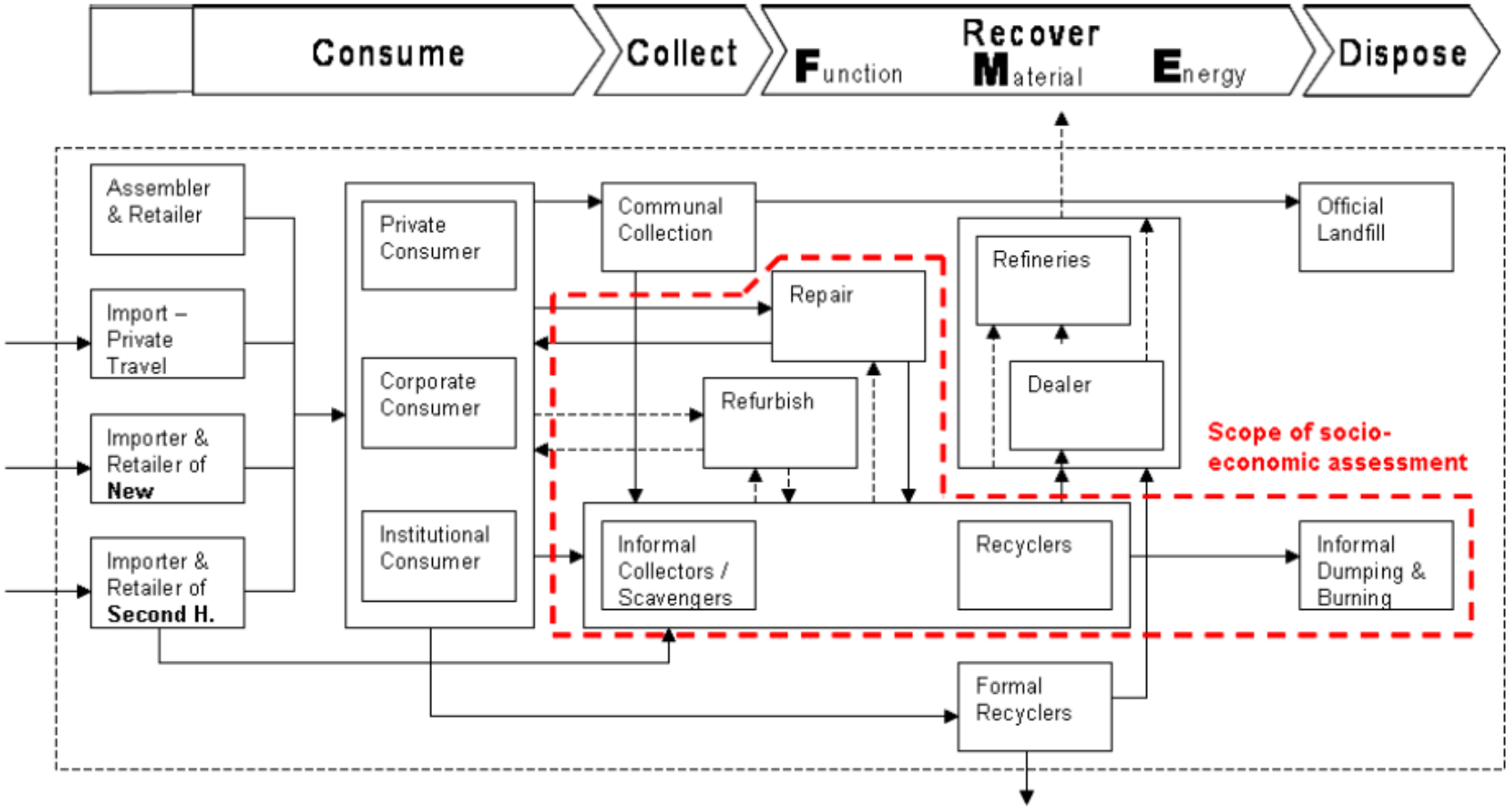
Production stages	Products and intermediate products					
6. Marketing	Branded notebook					
5. Final assembly	Notebook					
4. Assembly of complex components	Motherboard and network card	LCD display	Optical drive	Hard disk	Keyboard	Touchpad
	Batterypack	Power supply	Cooling system	Case	Other	
3. Manufacturing of single components	Microchips	Passive electronic components	Printed circuit boards	Cables	Operator controls	Plug connections
	Screw connections	Battery-cells				
2. Refining of raw materials	Silicon wafers	Glass products	Raw plastic products	Copper products	Copper-zinc products	Aluminium products
	...	Palladium products	Tantalum products			
1. Resource extraction	Quartz sand	Crude oil	Copper ore	Zinc ore	Bauxite	...
	Palladium ore	Tantalum ore	...	Scrap metal		

Scope of the study

Example 3: E-Waste Management in Ghana

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Socio-economic assessment and feasibility study on sustainable e-waste management in Ghana, Öko-Institut e.V., 2010



Methodological Approach

- Definition of goal & scope of the study
- Definition of system boundaries
  - Selection of life cycle stages
  - Selection of products, co-products and processes
- Selection of stakeholder categories to be considered
- Selection of case-specific subcategories
  - In accordance with the goal & scope of the study
  - In accordance with the stakeholder opinion
- Social Life Cycle Inventory
- Social Life Cycle Impact Assessment

Stakeholder Involvement

Methodological Approach

Social Life Cycle Impact Assessment

	Cobalt mining, DRC	Notebook production, China	E-Waste, Ghana
Employment	67,000 – 108,000 (ASM)	50,000 – 75,000 (Assembly)	20,000 – 30,000
Working Hours	~ 208 - 236 h per month	~ 192 - 330 h per month	~ 210 - 360 h per month
Child labour	Yes, 28% of total work force	No	Yes
Remuneration	~ 84 – 140 US$	~ 109 – 130 US$	~ 70 – 280 US$
Freedom of association & right to collective bargaining	Informal sector; cooperatives present, but mostly uneffective	No	Informal sector, cooperatives present, which seem to represent the interests of their members
Emploment security	No	Short-term contract	No
…..			

Methodological Approach

Social Life Cycle Impact Assessment, e.g. cobalt mining

Table 6: Working minutes of artisanal cobalt extraction in the DRC per product

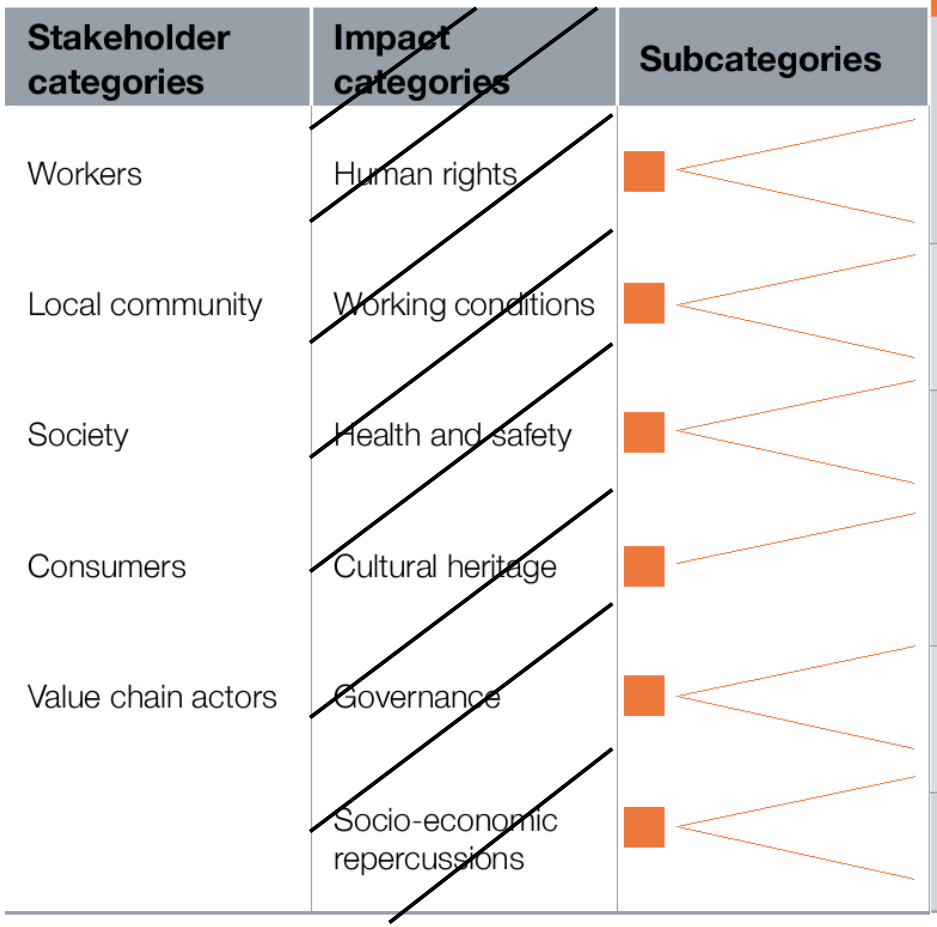
	Amount of Co in application [g]	Share of Co sourced from artisanal mining in the DRC	Working minutes for artisanal Co-diggers in the DRC (per product)	Working minutes for artisanal Co-washers in the DRC (per product)	Working minutes for artisanal Co-sorters in the DRC (per product)
Notebook	65	1/3	7	1	2
Hybrid-vehicle	2500	1/3	263	24	83

Table 7: Social indictor values of artisanal cobalt mining in the DRC for selected cobalt containing products

	Average notebook	Average hybrid vehicle
Labour input per product	10 min	370 min
Child labour input per product	3 min	104 min
Remuneration	0.05 US$	1.83 US$
Fatal mining accidents	0.00000021	0.0000081

Methodological Approach

Social Life Cycle Impact Assessment



Stakeholder categories	Subcategories
Stakeholder "worker"	Freedom of Association and Collective Bargaining Child Labour Fair Salary Working Hours Forced Labour Equal opportunities/Discrimination Health and Safety Social Benefits/Social Security
Stakeholder "consumer"	Health & Safety Feedback Mechanism Consumer Privacy Transparency End of life responsibility
Stakeholder "local community"	Access to material resources Access to immaterial resources Delocalization and Migration Cultural Heritage Safe & healthy living conditions Respect of indigenous rights Community engagement Local employment Secure living conditions
Stakeholder "society"	Public commitments to sustainability issues Contribution to economic development Prevention & mitigation of armed conflicts Technology development Corruption
Value chain actors* not including consumers	Fair competition Promoting social responsibility Supplier relationships Respect of intellectual property rights

- Quantitative & qualitative data
- Quantitative data, only if possible and feasible
- Aggregation & characterization factors not applied

Methodological lessons

- It is justified to select a part of the product life cycle to implement the S-LCA framework (in accordance with the goal & scope)
- A major advantage of using S-LCA can be attributed to the organisation of its structural elements → Focus beyond “Workers”
- Considering the dynamics of social events and impacts, the best option to conduct a S-LCA would be at the level of sub-categories
- Attempts to carry out impact assessment at the level of impact categories bear the risk of relativizing social impacts measured at the level of sub-categories.
- At the same time, such attempts pose serious ethical questions regarding balancing positive and negative social impacts within one impact category
- Even though theoretically, it might be possible to work at the level of impact categories, formulation of measures to improve social impacts still have to be done at the level of sub-categories.
- Local civil society organisations will not accept resource-intensive methodological approaches

Conclusions

- S-LCA methodology should be used to generate a better understanding of life cycle related issues, its hot spots, and cause and effect chains

- S-LCA should generally be used to prepare strategic decisions and to identify sustainability opportunities and optimization avenues, and *not* to perform any absolute evaluation.

- S-LCA should be accompanied by intensive stakeholder participation in order to address prevailing normative disparities and conflicts among various interest groups, cultures and (world) regions as well as changing social values.

- A big advantage of S-LCA methodology is its use in action-oriented decision making; both at the level of enterprise as well as policy. For such an objective, analysis of social impacts at the level of sub-categories is not only efficient in terms of time & resources, but it also leaves much less room for error and misinterpretations of social situations.

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Contact:
Siddharth Prakash

Email: s.prakash@oeko.de
Phone: ++49 (0)761 4529544
Fax: ++49 (0)761 4529588
Web: www.oeko.de
www.prosa.org