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A new, comprehensive database for social LCA: PSILCA

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PSILCA database – Agenda

1. Background and motivation
2. Approach
3. Application
4. Current Status
5. Results and conclusion

1 Background and motivation

Background and Motivation

- Social LCA studies typically cover global life cycles consisting of many different, interlinked processes
- Impossible and inefficient to collect specific information for every single process

→ Generic information for generic processes

→ Obvious and urgent need for a comprehensive, generic database for S-LCA

Background and Motivation

Challenges to be addressed

- Social data is often qualitative → hard to access, measure and organize
- Indicators (social measures) are needed to capture social observations, but no consensus about "important" social impacts
- Selection of indicators and assessment of impacts is subjective → different approaches, individual evaluation and interpretation

Background and Motivation

→ **A new database created, called PSILCA (Product Social Impact Life Cycle Assessment)**

2 Approach

Approach

Eora MRIO database as backbone (Lenzen et al.):

- 189 individual countries represented by a total of 15,909 sectors
- high-resolution heterogeneous classification, or 26-sector harmonized classification
- continuous coverage for the period 1970-2012 (satellite accounts to 2010)
- raw data drawn from the UN's System of National Accounts and COMTRADE databases, Eurostat...

Structure of processes

26 harmonized sectors (industries) for Afghanistan

1022 detailed sectors (industries and commodities) for UK

Indicator structure

- Social indicators and its structure mainly inspired by UNEP/SETAC guidance book:

STAKEHOLDER – SUBCATEGORY – INDICATOR – (SUBINDICATOR)

- Currently, there are 88 qualitative and quantitative indicators addressing 23 subcategories (topics) and 5 affected stakeholder groups

Stakeholders and Subcategories

Stakeholder	Subcategory
Workers	Child labour
	Forced labour
	Fair salary
	Working time
	Discrimination
	Health and Safety
	Social benefits, legal issues
	Workers´ rights
Value chain actors	Fair competition
	Corruption
	Promoting social responsibility
	Supplier relationships
Society	Health and Safety
	Contribution to economic development
	Prevention and mitigation of conflicts
Local community	Access to material resources
	Respect of indigenous rights
	Safe and healthy living conditions
	Local employment
	Migration
Consumers	Health and Safety
	Transparency
	End of life responsibility

Data sources

Variety of sources is considered for data collection:

- Reputable, statistical agencies (World Bank, International Labour Organization, World Health Organization, United Nations...)
- Private or governmental databases (ICTWSS database about trade unions etc. by University of Amsterdam, United States Department of Labor...)
- Various case studies and own investigation
- Big data analyses planned

Data attribution

- In many cases, data is not directly attributable or not available for specific sectors, data attribution through:

  → Interpolation (from higher level clusters to lower levels)

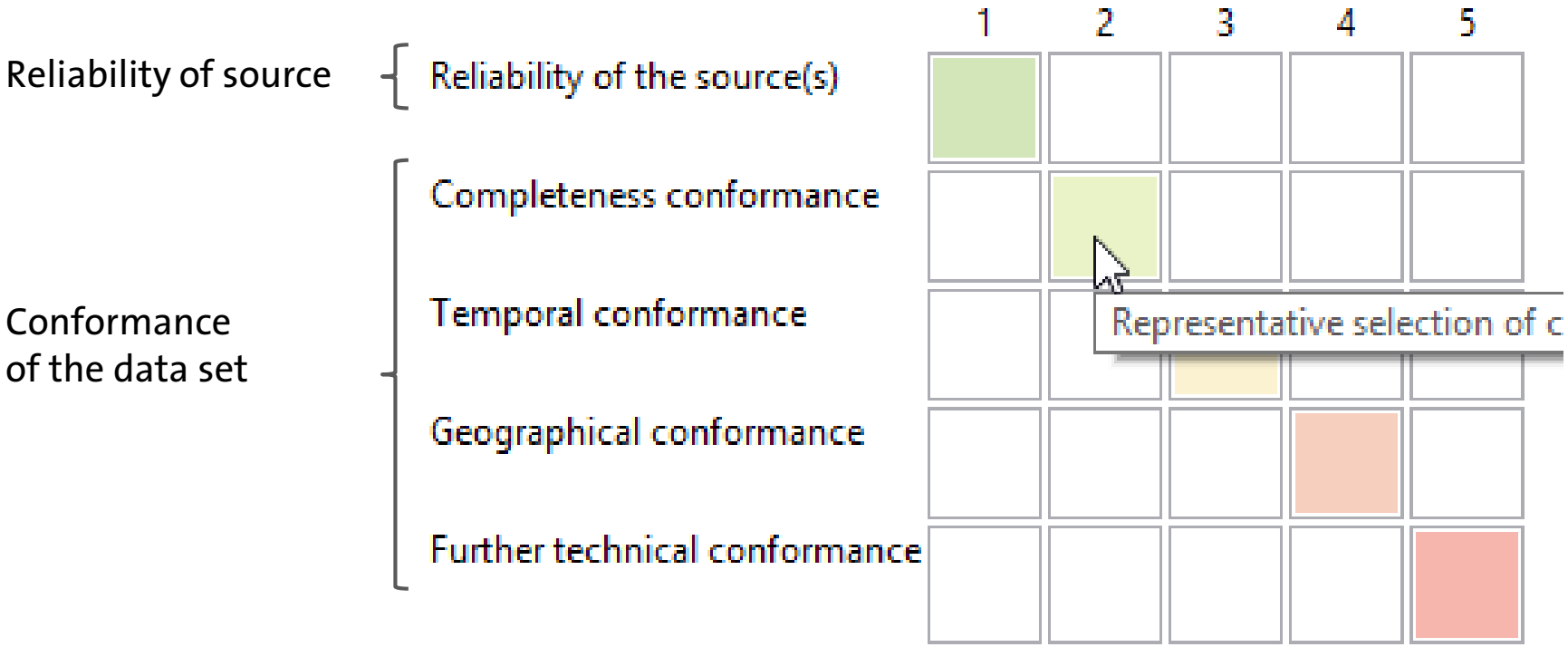
  → Extrapolation of known values (from lower level clusters to higher levels)

  → Average values (over countries of country groups, over sectors within one country)

→ This “extrapolation” of data is documented as part of data quality

Data quality

- Data quality assessed by a square, pedigree matrix (based on Weidema and Wesnæs (1996), but adapted to social LCA, Ciroth and Franze 2014)



Indicator assessment

- Assessed by an ordinal risk scale of typically 6 different risk levels:

no risk, very low risk, low risk, medium risk, high risk, very high risk

Outputs

Flow	Category	Flow
Mining and Quarrying - BDI	Burundi/Industries	Mark
Children in employment, female; very high risk	Child labour	Units
Children in employment, male; very high risk	Child labour	Units
Children in employment, total; very high risk	Child labour	Units
Gender wage gap; no data	Discrimination	Units
Anti-competitive behaviour or violation of anti-trust and monopoly legislation; ver...	Fair competition	Units
Living wage, per month; no data	Fair salary	Units
Minimum wage, per month; very high risk	Fair salary	Units
Trafficking in persons; high risk	Forced Labour	Units
Goods produced by forced labour; no risk	Forced Labour	Units
Frequency of forced labour; high risk	Forced Labour	Units
DALYs due to indoor and outdoor air and water pollution; very high risk	Health and safety of work...	Units

Indicator assessment

- For some indicators, additionally positive aspects will be considered (e.g. *Respect of indigenous rights, Fair salary*):

  high opportunity, medium opportunity, low opportunity

- Evaluation of indicator risk levels is subjective → both the indicator values and the indicator risk levels are provided
- Risk levels can be modified individually

Indicator assessment in openLCA

Social aspects

Social assessment

Name	Raw value	Risk level	Activity variable	DataQuality	Comment	Source
Workers						
Child labour						
Children in employment, total	4.2 [%]	Low risk	0.018757696201458 [h, Worker hours]	(2;1;4;1;4)	Data from 2011	World Bank, 2014
Discrimination						
Gender wage gap	29.9516623437868 [%]	High risk	0.018757696201458 [h, Worker hours]	(3;1;2;1;1)	Data from 2013	ILOstat, 2014
Forced Labour						
Trafficking in persons	Tier 2 [Tier]	Medium risk	0.018757696201458 [h, Worker hours]	(2;1;1;1;4)		U.S. Department of State, 2014

Social indicator: Gender wage gap

General information

Additional information

Unit of measurement	%
Evaluation scheme	0% = no risk; 0% - <5% and 0% - >-5%= very low risk; 5% - <10% and -5% - >-10% = low risk; 10% - <20% and -10% - >-20% = medium risk; 20% - <30% and -20% - >-30% = high risk; >=30% and <=-30 = very high risk; n.a. = no data

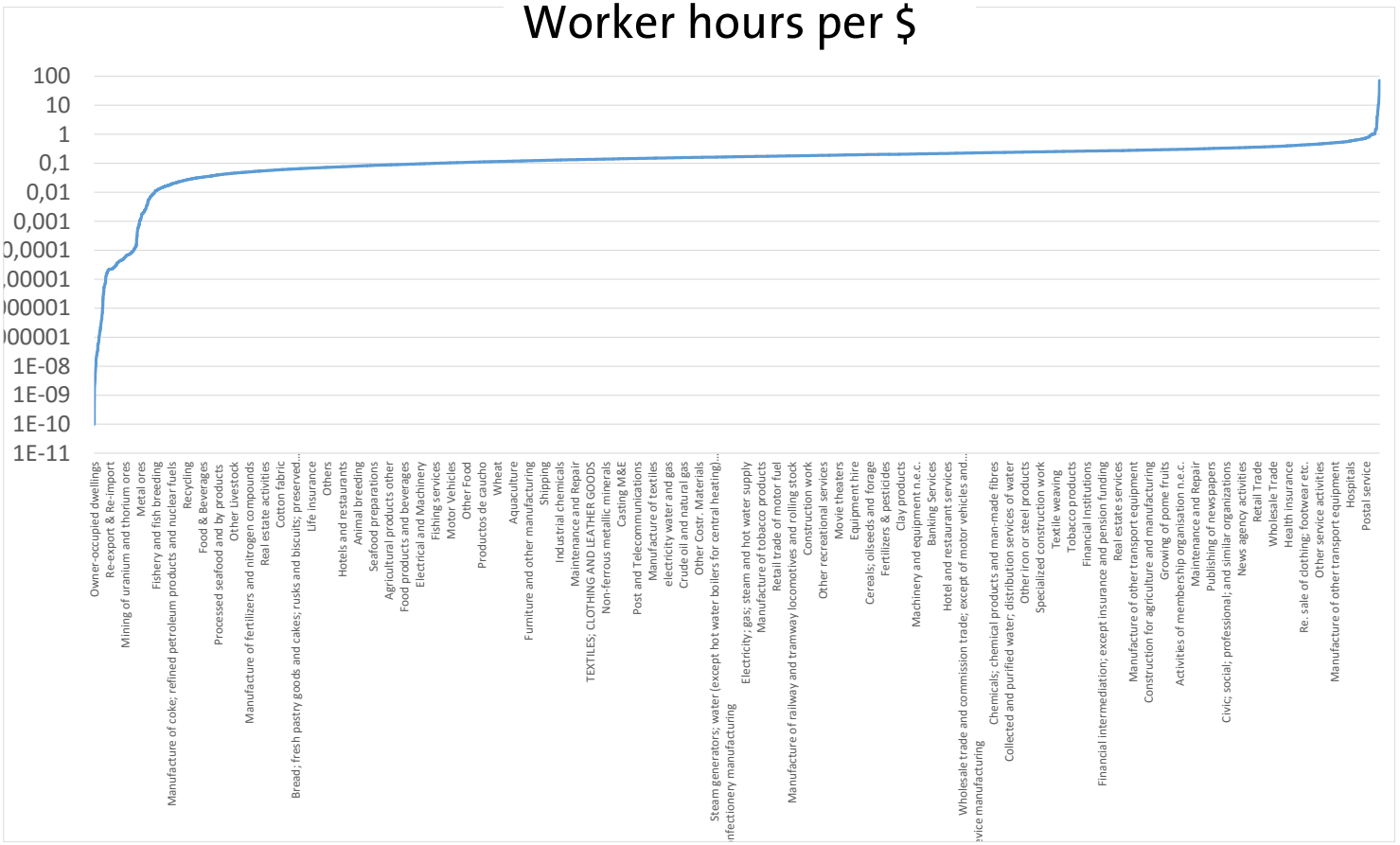
Activity variable

- So-called “activity variables” (Norris 2006) are necessary to describe the relevance of impacts caused by a process in a life cycle
- Worker hours are applied (initially to all indicators, also those not concerning labor conditions) (also used by Benoît-Norris et al. 2012 in SHDB) =

h/USD output for each process

- Further activity variables for other stakeholders are currently being assessed

Worker hour example, ordered, all sectors (PSILCA)



→ **Most values range between 0.01 and 1**

4 Application

Application

- "Policy-type" application (Entire economy/ specific industry sector in a country is assessed)

→ Derive recommendations for political actors in key policy issues, e.g. sustainable consumption, development cooperation, legislation

Ex.: - Socially sustainable coffee import

- Legislation for sustainable construction

- Application for hybrid cases

→ Connect specific information of foreground processes to generic information of PSILCA for background processes

5 Current status

„Interactive“ database

- Network of collaborators is created → data collection and provision; local customer support

Scientific Advisory Council (SAC):

- To ensure feedback on selected approach, method and on updates of database

User Advisory Council (UAC):

- To provide practical feedback and to steer the database development and maintenance

Outcome

- At present PSILCA is available for openLCA
- Versions for other LCA software systems (especially SimaPro) are being prepared
- Database available in 3 different versions (Starter, Professional, Developer), distinguished by:

    - Provision of original indicator values
    - Provision of information about data quality
    - Applied cut-off-criterion

6 Results and conclusion

Results

PSILCA is one important step towards increasing data availability for social LCA;

Unique features:

- Transparent indicators
- Data quality
- Really comprehensive and up-to date MRIO database as “backbone”

Results

However, social data are more difficult to capture and to maintain →

- Group of external (non-GreenDelta) data collectors and evaluators established, including ENEA (Italy), Ciraig (Canada)

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Thank you

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