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sustainability consulting + software

The „PSILCA" social LCA database – challenges in creating, using, and maintaining it

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The PSILCA social LCA database

PSILCA

- PSILCA is a database for social LCA, i.e. for assessing social impacts related to a product, service, or organization, over the entire life cycle

- Initiated, developed and maintained by GreenDelta since 2014

- Current version is 3.1, released 2 weeks ago

PSILCA, use cases

- Review industrial sectors and social indicators for different countries

- Calculate and assess the social impacts of products along life cycles, in combination with specific foreground models, typically

- Perform social hotspots analyses

- Technology assessments

- Specific cases, e.g. "Social License to Operate" for mining sites, as background information

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PSILCA approach and structure

Eora as backbone

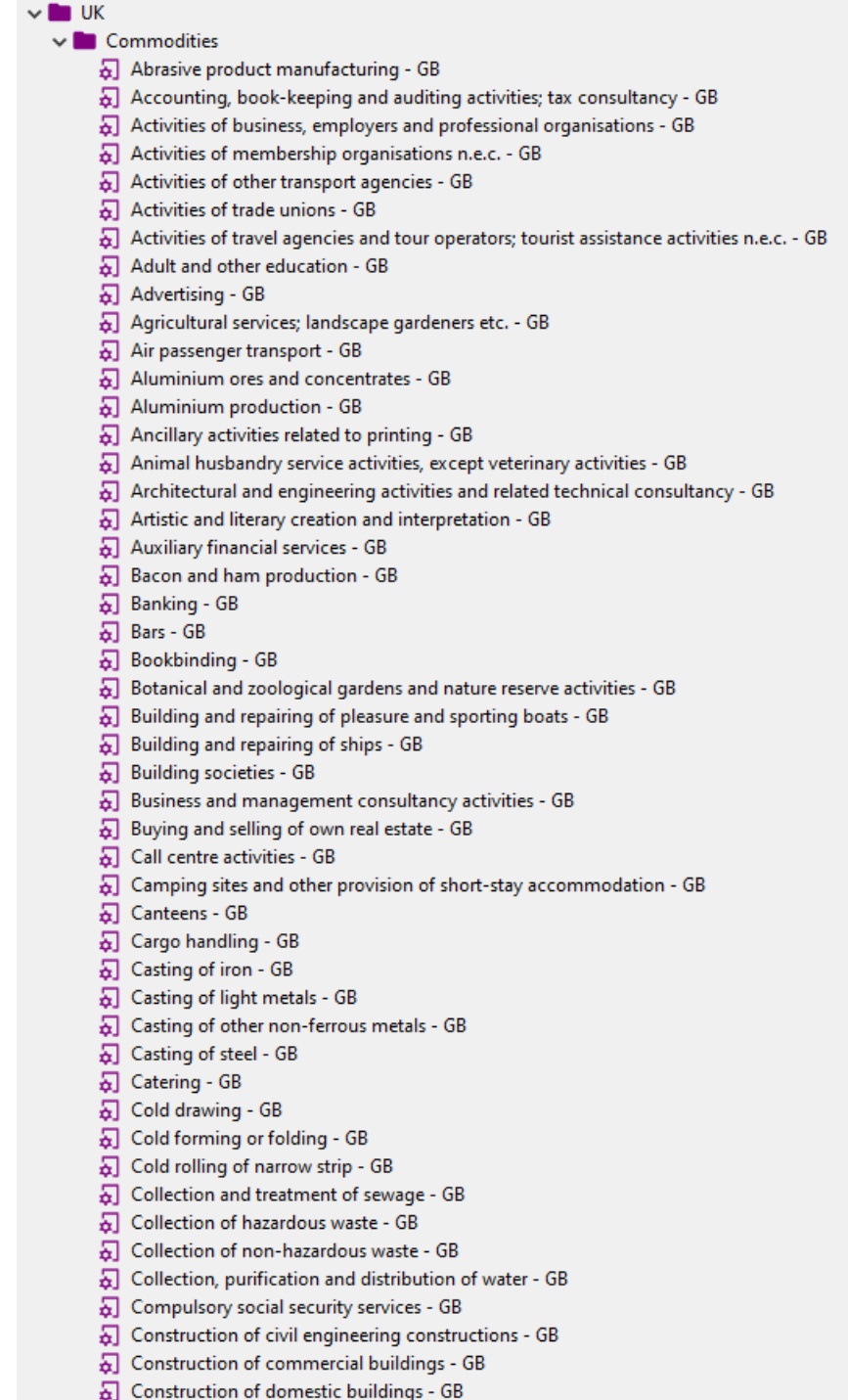Eora MRIO database as backbone (Lenzen et al. 2013, annual updates):

- 189 individual countries represented by a total of 14,839 sectors (classified by entity: industries and commodities)

- high-resolution heterogeneous classification, or 26-sector harmonized classification

- Monetary process connections

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Structure of processes

26 common sectors (industries) for Afghanistan

1022 detailed sectors (industries and commodities) for the UK

```
∨ 📁 Afghanistan
    ∨ 📁 Industries
        ⚙ Agriculture - AF
        ⚙ Construction - AF
        ⚙ Education, Health and Other Services - AF
        ⚙ Electricity, gas, and water supply - AF
        ⚙ Financial Intermediation and Business Activities - AF
        ⚙ Fishing - AF
        ⚙ Hotels and Restaurants - AF
        ⚙ Maintenance and Repair - AF
        ⚙ Manufacture of electrical machinery and equipment - AF
        ⚙ Manufacture of food products and beverages - AF
        ⚙ Metal Products - AF
        ⚙ Mining and Quarrying - AF
        ⚙ Other Manufactures - AF
        ⚙ Others - AF
        ⚙ Petroleum, Chemical and Non-Metallic Mineral Products - AF
        ⚙ Post and telecommunications - AF
        ⚙ Private Households - AF
        ⚙ Public Administration - AF
        ⚙ Re-export and Re-import - AF
        ⚙ Recycling - AF
        ⚙ Retail Trade - AF
        ⚙ Textiles and Wearing Apparel - AF
        ⚙ Transport - AF
        ⚙ Transport Equipment - AF
        ⚙ Wholesale Trade - AF
        ⚙ Wood and Paper - AF
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Screenshots from openLCA

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∨ 📁 UK
    ∨ 📁 Commodities
        ⚙ Abrasive product manufacturing - GB
        ⚙ Accounting, book-keeping and auditing activities; tax consultancy - GB
        ⚙ Activities of business, employers and professional organisations - GB
        ⚙ Activities of membership organisations n.e.c. - GB
        ⚙ Activities of other transport agencies - GB
        ⚙ Activities of trade unions - GB
        ⚙ Activities of travel agencies and tour operators; tourist assistance activities n.e.c. - GB
        ⚙ Adult and other education - GB
        ⚙ Advertising - GB
        ⚙ Agricultural services; landscape gardeners etc. - GB
        ⚙ Air passenger transport - GB
        ⚙ Aluminium ores and concentrates - GB
        ⚙ Aluminium production - GB
        ⚙ Ancillary activities related to printing - GB
        ⚙ Animal husbandry service activities, except veterinary activities - GB
        ⚙ Architectural and engineering activities and related technical consultancy - GB
        ⚙ Artistic and literary creation and interpretation - GB
        ⚙ Auxiliary financial services - GB
        ⚙ Bacon and ham production - GB
        ⚙ Banking - GB
        ⚙ Bars - GB
        ⚙ Bookbinding - GB
        ⚙ Botanical and zoological gardens and nature reserve activities - GB
        ⚙ Building and repairing of pleasure and sporting boats - GB
        ⚙ Building and repairing of ships - GB
        ⚙ Building societies - GB
        ⚙ Business and management consultancy activities - GB
        ⚙ Buying and selling of own real estate - GB
        ⚙ Call centre activities - GB
        ⚙ Camping sites and other provision of short-stay accommodation - GB
        ⚙ Canteens - GB
        ⚙ Cargo handling - GB
        ⚙ Casting of iron - GB
        ⚙ Casting of light metals - GB
        ⚙ Casting of other non-ferrous metals - GB
        ⚙ Casting of steel - GB
        ⚙ Catering - GB
        ⚙ Cold drawing - GB
        ⚙ Cold forming or folding - GB
        ⚙ Cold rolling of narrow strip - GB
        ⚙ Collection and treatment of sewage - GB
        ⚙ Collection of hazardous waste - GB
        ⚙ Collection of non-hazardous waste - GB
        ⚙ Collection, purification and distribution of water - GB
        ⚙ Compulsory social security services - GB
        ⚙ Construction of civil engineering constructions - GB
        ⚙ Construction of commercial buildings - GB
        ⚙ Construction of domestic buildings - GB
```

Social indicators

- Social indicators and their structure mainly inspired by UNEP/SETAC guidance book, some indicators are added:

STAKEHOLDER – SUBCATEGORY – INDICATOR – (SUBINDICATOR)

- In PSILCA v 3.1, there are 70 qualitative and quantitative indicators addressing 21 subcategories (topics) and 4 affected stakeholder groups

- Measured in different units such as single values, percentages or text

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Social indicators

LOCAL COMMUNITY			
Subcategory	Indicator	Unit of measurement	Coverage
Access to material resources	Certified environmental management systems	# of CEMS (ISO 14001) per 10,000 employees in the time frame (5 years)	S
	Extraction of biomass (related to area)	annual t/km²	C
	Extraction of biomass (related to population)	annual t/cap	C
	Extraction of fossil fuels	annual t/cap	C
	Extraction of industrial and construction minerals	annual t/cap	C
	Extraction of ores	annual t/cap	C
	Level of industrial water use (related to renewable water resources)	% of total actual renewable water resources per year	C
	Level of industrial water use (related to total withdrawal)	% of total water withdrawal per year	C
Environmental footprints	Embodied agricultural area footprint	ha/$	S
	Embodied forest area footprint	ha/$	S
	Embodied water footprint	Mm3/$	S
	Number of threatened species	# species/$	S
GHG footprints	Embodied CO2 footprint	t/$	S
	Embodied CO2-eq footprint	t/$	S
Local employment	Unemployment rate in the country	% of population ages 15-64 in reference year	C

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Social indicators

	Emigration rate	Ratio migrant outflow and total population, in reference year	C
Migration	Immigration rate	Ratio migrant inflow and total population, in reference year	C
	International Migrant Stock	% of population, in reference year	C
	International migrant workers in the sector	% of total employed population in the sector in reference year	S
	Net migration rate	$\permil$ (per 1,000 persons) in reference year	C
	Asylum seekers rate	Ratio asylum seekers and total population, in the time frame (2 years)	C
Respect of indigenous rights	Indigenous People Rights Protection Index	6 point scale (0-5)	C
	Presence of indigenous population	yes/no	C
Safe and healthy living conditions	Drinking water coverage	% of population	C
	Pollution level of the country	Pollution Index in reference year	C
	Sanitation coverage	% of population	C

Social indicators

SOCIETY			
Subcategory	Indicator	Unit of measurement	Coverage
Contribution to economic development	Contribution of the sector to economic development	% of GDP	S
	Embodied value added total	$/$	S
	Illiteracy rate, female	% of female population 15+ years	C
	Illiteracy rate, male	% of male population 15+ years	C
	Illiteracy rate, total	% of total population 15+ years	C
	Public expenditure on education	% of GDP	C
	Youth illiteracy rate, female	% of female population 15-24 years	C
	Youth illiteracy rate, male	% of male population 15-24 years	C
	Youth illiteracy rate, total	% of total population 15-24 years	C
Health and safety	Global Peace Index	index	C
	Health expenditure, domestic general government	% of total health expenditure in reference year	C
	Health expenditure, external resources	% of total health expenditure in reference year	C
	Health expenditure, out-of-pocket	% of total health expenditure in reference year	C
	Health expenditure, total	% of GDP	C
	Life expectancy at birth	years	C

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Social indicators

VALUE CHAIN ACTORS			
Subcategory	**Indicator**	**Unit of measurement**	**Coverage**
Corruption	Active involvement of enterprises in corruption and bribery	% of sector-related cases out of all registered foreign bribery cases in the time frame (15 years)	S
	Public sector corruption	index score	C
Fair competition	Presence of anti-competitive behaviour or violation of anti-trust and monopoly legislation	Cases per 10,000 employees in the time frame (5 years)	S
Promoting social responsibility	Social responsibility along the supply chain	Number of companies in the sector	S
WORKERS			
Subcategory	**Indicator**	**Unit of measurement**	**Coverage**
Child labour	Children in employment, female	% of female children ages 5-17	S
	Children in employment, male	% of male children ages 5-17	S
	Children in employment, total	% of all children ages 5-17	S
Discrimination	Gender wage gap	% difference male and female wages in reference year	S
	Men in the sectoral labour force	ratio men (% economic active female population) / women+men (% economic active total population) in reference year	S
	Women in the sectoral labour force	ratio women (% economic active male population) / women+men (% economic active total population) in reference year	S
Fair salary	Living wage, per month	USD	C
	Minimum wage, per month	USD	C
	Sector average wage, per month	Ratio salary (sector wage)/living wage	S

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Social indicators

	Frequency of forced labour	Cases per 1,000 inhabitants in the country in reference year	C
Forced labour	Goods produced by forced labour	Number of goods in the sector (score for technical conformance from data mapping)	S
	Trafficking in persons	Tier placement	C
Freedom of association and collective bargaining	Right of Association	4 point scale (0-3)	S
	Right of Collective bargaining	4 point scale (0-3)	S
	Right to Strike	4 point scale (0-3)	S
	Trade union density	% of employees organised in trade unions in reference year	C
Health and safety	DALYs due to indoor and outdoor air and water pollution	DALY rate per 1,000 inhabitants in the country per year	C
	Presence of sufficient safety measures	OSHA cases per 100,000 employees in the time frame (4 years)	S
	Rate of fatal accidents at workplace	cases per 100,000 employees and year	S
	Rate of non-fatal accidents at workplace	cases per 100,000 employees and year	S
	Violations of mandatory health and safety standards	ratio number of cases/available labour force in reference year	C
	Workers affected by natural disasters	% of population affected in the time frame (3 years)	C
Social benefits, legal issues	Evidence of violations of laws and employment regulations	cases per 10,000 employees in the time frame (7 years)	S
	Social security expenditures	% of GDP	C
Working time	Weekly hours of work per employee	hours	S

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Indicator assessment

- Assessed by an ordinal risk scale of different risk and opportunity levels:

  high opportunity, medium opportunity, low opportunity, no opportunity/ no risk, very low risk, low risk, medium risk, high risk, very high risk, (no data)

- Evaluation of indicator risk levels is subjective →

  - Assessment base is made transparent

  - both the indicator raw values and the risk evaluation schemes are provided

  - Risk levels can be modified individually

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Social LCA calculation result, with data quality

Printing and electronic publishing - DE

▾ Impact analysis: Social Impacts Weighting Method

Sub-group by: ⦿ Flows ◯ Processes | Don't show < 1 %

Name	Category	Inventory result	Characterization factor	Impact assessment result	R	C	T	G	F
Active involvement of enterprises in corruption and bribery	Social Impacts Weighting Method			0.05244 AI med risk hours	2	2	3	2	3
Anti-competitive behaviour or violation of anti-trust and monopoly	Social Impacts Weighting Method			0.05605 AC med risk hours	2	2	1	1	2
Association and bargaining rights	Social Impacts Weighting Method			0.18819 ACB med risk hours	1	1	1	1	1
Biomass consumption	Social Impacts Weighting Method			0.29429 BM med risk hours	2	1	1	1	5
Certified environmental management system	Social Impacts Weighting Method			0.97554 CMS med risk hours	1	2	1	1	2
Child Labour, female	Social Impacts Weighting Method			0.00117 CL med risk hours	1	2	2	2	2
Child Labour, male	Social Impacts Weighting Method			0.00173 CL med risk hours	1	2	2	2	2
Child Labour, total	Social Impacts Weighting Method			0.00163 CL med risk hours	1	2	2	2	2
Contribution of the sector to economic development	Social Impacts Weighting Method			0.05640 CE med risk hours	2	3	2	1	3
DALYs due to indoor and outdoor air and water pollution	Social Impacts Weighting Method			0.00897 DALY med risk hours	2	1	5	1	4
Drinking water coverage	Social Impacts Weighting Method			0.20540 DW med risk hours	1	1	2	1	5
Embodied agricultural area footprints	Social Impacts Weighting Method			0.00100 EAF med risk hours	1	2	2	1	2
Embodied biodiversity footprints	Social Impacts Weighting Method			0.06184 EBF med risk hours	1	2	2	1	2
Embodied forest area footprints	Social Impacts Weighting Method			0.00125 EFA med risk hours	1	2	2	1	2
Embodied water footprints	Social Impacts Weighting Method			0.01382 EWF med risk hours	1	2	2	1	2
Expenditures on education	Social Impacts Weighting Method			0.16034 EE med risk hours	1	2	2	1	5
Fair Salary	Social Impacts Weighting Method			1.92388 FS med risk hours	1	1	1	1	5
Fatal accidents	Social Impacts Weighting Method			0.00095 FA med risk hours	1	1	1	1	1
Fossil fuel consumption	Social Impacts Weighting Method			0.00155 FF med risk hours	2	1	2	1	5
Frequency of forced labour	Social Impacts Weighting Method			0.00086 FL med risk hours	1	1	1	1	5
Gender wage gap	Social Impacts Weighting Method			0.21449 GW med risk hours	1	2	1	2	5
GHG Footprints	Social Impacts Weighting Method			0.15993 GHGF med risk hours	1	2	2	1	2
Global peace index	Social Impacts Weighting Method			0.11455 GPI med risk hours	2	1	1	1	5
Goods produced by forced labour	Social Impacts Weighting Method			0.00395 GFL med risk hours					1
Health expenditure	Social Impacts Weighting Method			0.25925 HE med risk hours	2	2	1	2	5
Illiteracy, female	Social Impacts Weighting Method			0.16920 I med risk hours	1	3	1	2	5
Illiteracy, male	Social Impacts Weighting Method			0.14901 I med risk hours	1	2	1	2	5
Illiteracy, total	Social Impacts Weighting Method			0.15140 I med risk hours	1	3	1	2	5
Indigenous rights	Social Impacts Weighting Method			0.02319 IR med risk hours	3	1	2	1	5
Industrial water depletion	Social Impacts Weighting Method			1.52256 WU med risk hours	2	2	4	1	5
International migrant stock	Social Impacts Weighting Method			0.20817 IMS med risk hours	2	2	2	1	5
International migrant workers (in the sector/ site)	Social Impacts Weighting Method			0.01612 IMW med risk hours	1	2	3	1	1
Life expectancy at birth	Social Impacts Weighting Method			0.02549 LE med risk hours	2	1	1	1	5
Men in the sectoral labour force	Social Impacts Weighting Method			0.00843 M med risk hours	2	2	2	1	2
Migration flows	Social Impacts Weighting Method			2.17047 MF med risk hours	2	2	1	1	5
Minerals consumption	Social Impacts Weighting Method			0.22473 MC med risk hours	2	1	2	1	5
Net migration	Social Impacts Weighting Method			0.00212 NM med risk hours	2	2	1	1	5
Non-fatal accidents	Social Impacts Weighting Method			0.04989 NFA med risk hours	1	1	1	1	1
Pollution	Social Impacts Weighting Method			0.22106 P med risk hours	3	3	1	1	5
Promoting social responsibilty	Social Impacts Weighting Method			0.53920 PSR med risk hours	1	2	1	1	5
Public sector corruption	Social Impacts Weighting Method			1.59300 C med risk hours	1	2	1	1	5
Safety measures	Social Impacts Weighting Method			0.05700 SM med risk hours	1	2	1	5	2
Sanitation coverage	Social Impacts Weighting Method			0.67411 SC med risk hours	1	1	3	1	5
Social security expenditures	Social Impacts Weighting Method			0.20360 SS med risk hours	2	1	2	1	4
Trade unionism	Social Impacts Weighting Method			1.59216 TU med risk hours	1	1	1	1	1
Trafficking in persons	Social Impacts Weighting Method			0.26150 TP med risk hours	1	1	1	1	5
Unemployment	Social Impacts Weighting Method			0.01675 U med risk hours	3	3	1	1	5
Value added (total)	Social Impacts Weighting Method			0.40825 VAT med risk hours	1	2	2	1	2
Violations of employment laws and regulations	Social Impacts Weighting Method			0.28616 VL med risk hours	1	1	1	1	5
Weekly hours of work per employee	Social Impacts Weighting Method			0.04575 WH med risk hours	1	2	1	3	2
Women in the sectoral labour force	Social Impacts Weighting Method			0.03714 W med risk hours	2	2	2	1	2
Workers affected by natural disasters	Social Impacts Weighting Method			0.07139 ND med risk hours	1	1	3	1	4
Youth illiteracy, female	Social Impacts Weighting Method			0.00937 YI med risk hours	1	2	3	1	5
Youth illiteracy, male	Social Impacts Weighting Method			0.02613 YI med risk hours	1	3	2	2	5
Youth illiteracy, total	Social Impacts Weighting Method			0.02752 YI med risk hours	1	3	2	2	5

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▼ Impact analysis: Social Impacts Weighting Method

Sub-group by: ◉ Flows ○ Processes | Don't show < [1] %

Name	Category	Inventory result	Characterization factor	Impact assessment result	R	C	T	G	F
▷ ▤ Active involvement of enterprises in corruption and bribery	Social Impacts Weighting Method			0.05244 AI med risk hours	2	2	3	2	3
▷ ▤ Anti-competitive behaviour or violation of anti-trust and monopoly	Social Impacts Weighting Method			0.05605 AC med risk hours	2	2	1	1	2
▷ ▤ Association and bargaining rights	Social Impacts Weighting Method			0.18819 ACB med risk hours	1	1	1	1	1
▷ ▤ Biomass consumption	Social Impacts Weighting Method			0.29429 BM med risk hours	2	1	1	1	5
▷ ▤ Certified environmental management system	Social Impacts Weighting Method			0.97554 CMS med risk hours	1	2	1	1	2
▽ ▤ Child Labour, female	Social Impacts Weighting Method			0.00117 CL med risk hours	1	2	2	2	2
▽ ⊘ Children in employment, female; low risk	Social flows/Workers/Child labour	0.00021 d	2.40000 CL med risk hours/d ▪	0.00050 CL med risk hours	1	2	1	2	2
⬛ Wholesale Trade - DE	Germany/Commodities	2.00300E-5 d		4.80721E-5 CL med risk hours	1	2	1	2	2
⬛ Business services - DE	Germany/Commodities	1.52204E-5 d		3.65291E-5 CL med risk hours	1	2	1	2	2
⬛ Wholesale and retail trade - CN	China/Commodities	6.59218E-6 d		1.58212E-5 CL med risk hours	1	2	1	2	2
⬛ Banking - DE	Germany/Commodities	6.34850E-6 d		1.52364E-5 CL med risk hours	1	2	1	2	2
▷ ⊘ Children in employment, female; very high risk	Social flows/Workers/Child labour	9.09456E-8 d	2400.00000 CL med risk hours/d ▪	0.00022 CL med risk hours	1	2	2	1	2
▷ ⊘ Children in employment, female; medium risk	Social flows/Workers/Child labour	7.88599E-6 d	24.00000 CL med risk hours/d ▪	0.00019 CL med risk hours	1	2	1	2	2
▷ ⊘ Children in employment, female; very low risk	Social flows/Workers/Child labour	0.00059 d	0.24000 CL med risk hours/d ▪	0.00014 CL med risk hours	1	2	1	1	2
▷ ⊘ Children in employment, female; high risk	Social flows/Workers/Child labour	5.17557E-7 d	240.00000 CL med risk hours/d ▪	0.00012 CL med risk hours	1	2	2	2	2
▷ ▤ Child Labour, male	Social Impacts Weighting Method			0.00173 CL med risk hours	1	2	2	2	2
▷ ▤ Child Labour, total	Social Impacts Weighting Method			0.00163 CL med risk hours	1	2	2	2	2
▷ ▤ Contribution of the sector to economic development	Social Impacts Weighting Method			0.05640 CE med risk hours	2	3	2	1	3
▷ ▤ DALYs due to indoor and outdoor air and water pollution	Social Impacts Weighting Method			0.00897 DALY med risk hours	2	1	5	2	4
▷ ▤ Drinking water coverage	Social Impacts Weighting Method			0.20540 DW med risk hours	1	1	1	1	5
▷ ▤ Embodied agricultural area footprints	Social Impacts Weighting Method			0.00100 EAF med risk hours	1	2	2	1	2
▷ ▤ Embodied biodiversity footprints	Social Impacts Weighting Method			0.06184 EBF med risk hours	1	2	2	1	2
▷ ▤ Embodied forest area footprints	Social Impacts Weighting Method			0.00125 EFA med risk hours	1	2	2	1	2
▷ ▤ Embodied water footprints	Social Impacts Weighting Method			0.01382 EWF med risk hours	1	2	2	1	2
▷ ▤ Expenditures on education	Social Impacts Weighting Method			0.16034 EE med risk hours	1	2	2	1	5
▷ ▤ Fair Salary	Social Impacts Weighting Method			1.92388 FS med risk hours	1	1	1	1	5
▷ ▤ Fatal accidents	Social Impacts Weighting Method			0.00095 FA med risk hours	1	1	1	1	1
▽ ▤ Fossil fuel consumption	Social Impacts Weighting Method			0.00155 FF med risk hours	2	1	2	1	5
▽ ⊘ Extraction of fossil fuels; high risk	Social flows/Local Community/Access to material resources	3.51506E-6 d	240.00000 FF med risk hours/d ▪	0.00084 FF med risk hours	2	1	2	1	5
⬛ Manufacture of pulp, paper and paper products - NO	Norway/Commodities	6.31809E-7 d		0.00015 FF med risk hours	2	1	2	1	5
⬛ Manufacture of pulp, paper and paper products - NO	Norway/Industries	6.20249E-7 d		0.00015 FF med risk hours	2	1	2	1	5
⬛ Water transport - NO	Norway/Commodities	9.39999E-8 d		2.25600E-5 FF med risk hours	2	1	2	1	5
⬛ Chemicals, chemical products and man-made fibres - NO	Norway/Commodities	8.70287E-8 d		2.08869E-5 FF med risk hours	2	1	2	1	5
⬛ Wholesale trade and commission trade, except of motor vehic	Norway/Commodities	8.52049E-8 d		2.04492E-5 FF med risk hours	2	1	2	1	5
⬛ Other business services - NO	Norway/Industries	8.50472E-8 d		2.04113E-5 FF med risk hours	2	1	2	1	5
⬛ Wholesale trade and commission trade, except of motor vehic	Norway/Industries	7.64074E-8 d		1.83378E-5 FF med risk hours	2	1	2	1	5
⬛ Extraction of crude petroleum and natural gas; service activitie	Norway/Industries	7.27963E-8 d		1.74711E-5 FF med risk hours	2	1	2	1	5
⬛ Crude petroleum and natural gas; services incidental to oil and	Norway/Commodities	6.99765E-8 d		1.67944E-5 FF med risk hours	2	1	2	1	5
⬛ Crude petroleum and natural gas - KW	Kuwait/Industries	6.55573E-8 d		1.57338E-5 FF med risk hours	2	1	2	1	5
▷ ⊘ Extraction of fossil fuels; very high risk	Social flows/Local Community/Access to material resources	1.55683E-7 d	2400.00000 FF med risk hours/d ▪	0.00037 FF med risk hours	2	1	2	1	5
▷ ⊘ Extraction of fossil fuels; very low risk	Social flows/Local Community/Access to material resources	0.00084 d	0.24000 FF med risk hours/d ▪	0.00020 FF med risk hours	2	1	2	1	5
▷ ⊘ Extraction of fossil fuels; no data	Social flows/Local Community/Access to material resources	2.79024E-5 d	2.40000 FF med risk hours/d	6.69658E-5 FF med risk hours					
▷ ⊘ Extraction of fossil fuels; medium risk	Social flows/Local Community/Access to material resources	2.24578E-6 d	24.00000 FF med risk hours/d	5.38988E-5 FF med risk hours	2	1	2	1	5
▷ ▤ Frequency of forced labour	Social Impacts Weighting Method			0.00086 FL med risk hours	1	1	1	1	5
▷ ▤ Gender wage gap	Social Impacts Weighting Method			0.21494 GW med risk hours	1	2	1	2	5
▷ ▤ GHG Footprints	Social Impacts Weighting Method			0.15993 GHGF med risk hours	1	2	2	1	2
▷ ▤ Global peace index	Social Impacts Weighting Method			0.11455 GPI med risk hours	2	1	2	1	5
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▷ ▤ Health expenditure	Social Impacts Weighting Method			0.25925 HE med risk hours	2	2	1	2	5
▷ ▤ Illiteracy, female	Social Impacts Weighting Method			0.16920 I med risk hours	1	3	1	2	5
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▷ ▤ International migrant workers (in the sector/ site)	Social Impacts Weighting Method			0.01612 IMW med risk hours	1	2	1	1	3
▷ ▤ Life expectancy at birth	Social Impacts Weighting Method			0.02549 med risk hours	2	1	1	1	5
▷ ▤ Men in the sectoral labour force	Social Impacts Weighting Method			0.00843 M med risk hours	2	2	1	2	2
▷ ▤ Migration flows	Social Impacts Weighting Method			2.17047 MF med risk hours	2	2	1	1	5

Printing and electronic publishing, DE, non-fatal accidents

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Social indicators

Social aspects in openLCA to address indicators

Screenshots from openLCA

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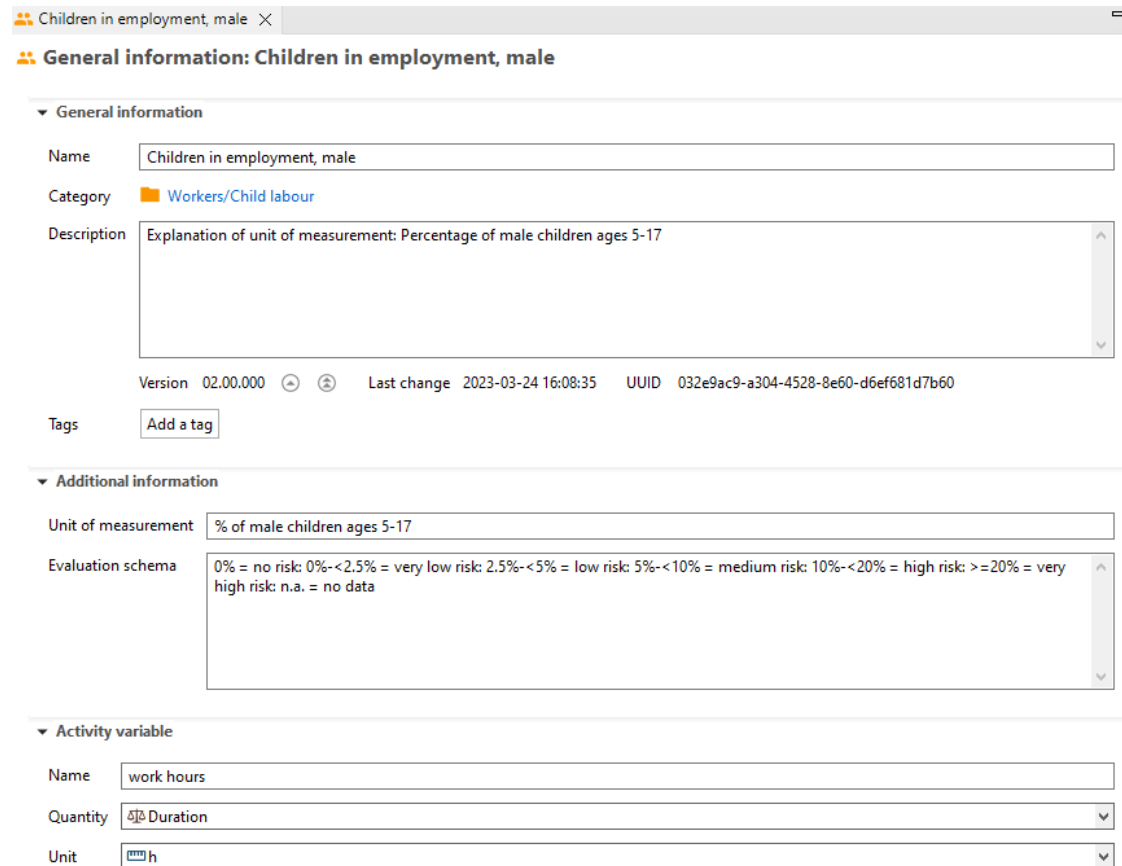
Social indicators

Social aspects in a process (in PSILCA Developer variant)

Social aspects: Agriculture - BD

▾ Social assessment

Name	Raw value	Risk level	Activity variable	Data quality	Comment	Source
▾ Workers						
▾ Social benefits, legal issues						
Social security expenditures	1.09 [% of GDP]	Very high risk	0.046852851119755 [h, work hours]	(2;1;2;1;4)	Data from PSILCA V2; Year: …	ILO 2015: Social Security
Evidence of violations of laws and employment re	0.15 [Cases per 10000 employees]	Low risk	0.046852851119755 [h, work hours]	(1;4;1;5;1)	Year: 2019	USDL: Violations of OSH…
▾ Discrimination						
Women in the sectoral labour force	1.36 [ratio]	Very low risk	0.046852851119755 [h, work hours]	(3;2;2;1;1)	Data from PSILCA V2; Year: …	ILO 2015: Employment b…
Gender wage gap	8.18 [%]	Low risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2017	ILOstat 2019
Men in the sectoral labour force	0.84 [ratio]	Very low risk	0.046852851119755 [h, work hours]	(3;2;2;1;1)	Data from PSILCA V2; Year: …	ILO 2015: Employment b…
▾ Fair Salary						
Living wage, per month (AV)	163.49 [USD]	Low risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	WI: Living wages 2018
Sector average wage, per month	137.20 [USD]	Very high risk	0.046852851119755 [h, work hours]	(1;1;1;1;1)	Year: 2017	WI: Wages in context 2015
Minimum wage, per month	18.03 [USD]	Very high risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	WI: Minimum wages 2018
▾ Child labour						
Children in employment, male	7.59 [% of male children ages 5-17]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;2;2)	Year: 2016	ILOstat: Children in empl…
Children in employment, total	6.08 [% of all children ages 5-17]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;2;2)	Year: 2016	ILOstat: Children in empl…
Children in employment, female	4.45 [% of female children ages 5-17]	Low risk	0.046852851119755 [h, work hours]	(1;2;1;2;2)	Year: 2016	ILOstat: Children in empl…
▾ Working time						
Weekly hours of work per employee	49.16 [h]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;1;3)	Year: 2017	ILOstat 2019
▾ Health and Safety						
DALYs due to indoor and outdoor air and water po	23.27 [Disability-adjusted life years per 1.000…	Medium risk	0.046852851119755 [h, work hours]	(2;1;5;1;4)	Year: 2004	WHO 2009: DALYs
Workers affected by natural disasters	6.30 [%]	High risk	0.046852851119755 [h, work hours]	(2;1;3;1;4)	Year: 2014	EMDAT 2012-2014
Presence of sufficient safety measures	4.8e-03 [Cases per 100.000 employees]	Low risk	0.046852851119755 [h, work hours]	(1;2;1;5;1)	Compensated Data; Year: 20…	OSHA: Severe Injury Rep…
Violations of mandatory health and safety standa	6.15246e-07 [ratio]	Low risk	0.046852851119755 [h, work hours]	(1;1;1;1;1)	Year: 2018	USDL: Violations of OSH…
Rate of non-fatal accidents at workplace		No data	0.046852851119755 [h, work hours]			
Rate of fatal accidents at workplace		No data	0.046852851119755 [h, work hours]			
▾ Freedom of association and collective bargaining						
Trade union density	18.45 [%]	Very high risk	0.046852851119755 [h, work hours]	(1;1;2;3;5)	Attributed value; Year: 2015	ILOstat, Trade Unions an…
Right of Association		No data	0.046852851119755 [h, work hours]			
Right of Collective bargaining		No data	0.046852851119755 [h, work hours]			
Right to Strike		No data	0.046852851119755 [h, work hours]			
▾ Forced Labour						
Frequency of forced labour	3.70 [Cases per 1.000 inhabitants]	Very low risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	GSI, Global Slavery Index …
Trafficking in persons	2.10 [Tier]	High risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	US: Trafficking in Persons…
Goods produced by forced labour		No data	0.046852851119755 [h, work hours]			
▾ Value Chain Actors						
▾ Fair competition						
Presence of anti-competitive behaviour or violati		No data	0.046852851119755 [h, work hours]			
▾ Corruption						
Public sector corruption	72.00 [Index score]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;1;5)	Year: 2017	TI: Corruption Perception…
Active involvement of enterprises in corruption a		No data	0.046852851119755 [h, work hours]			
▾ Promoting social responsibility						
Membership in an initiative that promotes social		No data	0.046852851119755 [h, work hours]			
▾ Local Community						
▾ Environmental Footprints						
Embodied agricultural area footprint	1.12644944060073e-03 [ha/$]	High risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	Eora 2015: GHG, Labor, a…
Number of threatened species	3.23383841136607e-06 [# species/$]	Very high risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	Eora 2015: GHG, Labor, a…
Embodied water footprint	1.02151150137125e-03 [Mm3/$]	Very high risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	Eora 2015: GHG, Labor, a…
Embodied forest area footprint	0.00 [ha/$]	No risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	Eora 2015: GHG, Labor, a…
▾ Access to material resources						
Extraction of biomass (related to area)	1759.83 [annual t/km2]	Very high risk	0.046852851119755 [h, work hours]	(2;1;1;1;5)	Year: 2017	MF:Global Material Flows…
Level of industrial water use (related to total witho	2.14 [% of total water withdrawal per year]	Very low risk	0.046852851119755 [h, work hours]	(2;1;5;1;5)	Original data; Year: 2008	WB: Public spending on …
Extraction of biomass (related to population)	1.54 [annual t/cap]	Very low risk	0.046852851119755 [h, work hours]	(2;1;2;1;5)	Year: 2015	MF:Global Material Flows…
Extraction of industrial and construction minerals	0.69 [annual t/cap]	Very low risk	0.046852851119755 [h, work hours]	(2;1;2;1;5)	Year: 2015	MF:Global Material Flows…
Extraction of fossil fuels	0.11 [annual t/cap]	Very low risk	0.046852851119755 [h, work hours]	(2;1;2;1;5)	Year: 2015	Aquastat: Food and Agri…
Level of industrial water use (related to renewable	0.02 [% of total actual renewable water reso…	Very low risk	0.046852851119755 [h, work hours]	(2;2;5;1;1)	Old Data; Year: 2002	Aquastat: Food and Agri…
Extraction of ores		No data	0.046852851119755 [h, work hours]			
Certified environmental management systems		No data	0.046852851119755 [h, work hours]			
▾ Safe and healthy living conditions						
Pollution level of the country	88.30 [Pollution Index]	Very high risk	0.046852851119755 [h, work hours]	(3;3;1;1;5)	Year: 2019	Numbeo: Pollution Index…
Drinking water coverage	61.40 [%]	Very high risk	0.046852851119755 [h, work hours]	(1;1;2;1;5)	Max of failed values; Year: 2…	WB: Safely managed drin…
Sanitation coverage	57.00 [%]	Very high risk	0.046852851119755 [h, work hours]	(1;1;4;1;5)	Year: 2012	WHO/UNICEF: 2015
▾ Local employment						

Screenshot from openLCA

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▸ Social assessment ⊕

Name	Raw value	Risk level	Activity variable	Data quality	Comment	Source
📁 Workers						
📁 Social benefits, legal issues						
👥 Social security expenditures	1.09 [% of GDP]	Very high risk	0.046852851119755 [h, work hours]	(2;1;2;1;4)	Data from PSILCA V2; Year: …	📖 ILO 2015: Social Security
👥 Evidence of violations of laws and employment re	0.15 [Cases per 10000 employees]	Low risk	0.046852851119755 [h, work hours]	(1;4;1;5;1)	Year: 2019	📖 USDL: Violations of OSH…
📁 Discrimination						
👥 Women in the sectoral labour force	1.36 [ratio]	Very low risk	0.046852851119755 [h, work hours]	(3;2;2;1;1)	Data from PSILCA V2; Year: …	📖 ILO 2015: Employment b…
👥 Gender wage gap	8.18 [%]	Low risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2017	📖 ILOstat 2019
👥 Men in the sectoral labour force	0.84 [ratio]	Very low risk	0.046852851119755 [h, work hours]	(3;2;2;1;1)	Data from PSILCA V2; Year: …	📖 ILO 2015: Employment b…
📁 Fair Salary						
👥 Living wage, per month (AV)	163.49 [USD]	Low risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	📖 WI: Living wages 2018
👥 Sector average wage, per month	137.20 [USD]	Very high risk	0.046852851119755 [h, work hours]	(1;1;1;1;1)	Year: 2017	📖 WI: Wages in context 2015
👥 Minimum wage, per month	18.03 [USD]	Very high risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	📖 WI: Minimum wages 2018
📁 Child labour						
👥 Children in employment, male	7.59 [% of male children ages 5-17]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;2;2)	Year: 2016	📖 ILOstat: Children in empl…
👥 Children in employment, total	6.08 [% of all children ages 5-17]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;2;2)	Year: 2016	📖 ILOstat: Children in empl…
👥 Children in employment, female	4.45 [% of female children ages 5-17]	Low risk	0.046852851119755 [h, work hours]	(1;2;1;2;2)	Year: 2016	📖 ILOstat: Children in empl…
📁 Working time						
👥 Weekly hours of work per employee	49.16 [h]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;1;3)	Year: 2017	📖 ILOstat 2019
📁 Health and Safety						
👥 DALYs due to indoor and outdoor air and water p	23.27 [Disability-adjusted life years per 1.000…	Medium risk	0.046852851119755 [h, work hours]	(2;1;5;1;4)	Year: 2004	📖 WHO 2009: DALYs
👥 Workers affected by natural disasters	6.30 [%]	High risk	0.046852851119755 [h, work hours]	(2;1;3;1;4)	Year: 2014	📖 EMDAT 2012-2014
👥 Presence of sufficient safety measures	4.8e-03 [Cases per 100.000 employees]	Low risk	0.046852851119755 [h, work hours]	(1;2;1;5;1)	Compensated Data; Year: 20…	📖 OSHA: Severe Injury Rep…
👥 Violations of mandatory health and safety standa	6.15246e-07 [ratio]	Low risk	0.046852851119755 [h, work hours]	(1;1;1;1;1)	Year: 2018	📖 USDL: Violations of OSH…
👥 Rate of non-fatal accidents at workplace		No data	0.046852851119755 [h, work hours]			
👥 Rate of fatal accidents at workplace		No data	0.046852851119755 [h, work hours]			
📁 Freedom of association and collective bargaining						
👥 Trade union density	18.45 [%]	Very high risk	0.046852851119755 [h, work hours]	(1;1;2;3;5)	Attributed value; Year: 2015	📖 ILOstat, Trade Unions an…
👥 Right of Association		No data	0.046852851119755 [h, work hours]			
👥 Right of Collective bargaining		No data	0.046852851119755 [h, work hours]			
👥 Right to Strike		No data	0.046852851119755 [h, work hours]			
📁 Forced Labour						
👥 Frequency of forced labour	3.70 [Cases per 1.000 inhabitants]	Very low risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	📖 GSI, Global Slavery Index …
👥 Trafficking in persons	2.10 [Tier]	High risk	0.046852851119755 [h, work hours]	(1;1;1;1;5)	Year: 2018	📖 US: Trafficking in Persons…
👥 Goods produced by forced labour		No data	0.046852851119755 [h, work hours]			
📁 Value Chain Actors						
📁 Fair competition						
👥 Presence of anti-competitive behaviour or violati		No data	0.046852851119755 [h, work hours]			
📁 Corruption						
👥 Public sector corruption	72.00 [Index score]	Medium risk	0.046852851119755 [h, work hours]	(1;2;1;1;5)	Year: 2017	📖 TI: Corruption Perception…
👥 Active involvement of enterprises in corruption a		No data	0.046852851119755 [h, work hours]			
📁 Promoting social responsibilty						
👥 Membership in an initiative that promotes social		No data	0.046852851119755 [h, work hours]			
📁 Local Community						
📁 Environmental Footprints						
👥 Embodied agricultural area footprint	1.12644944060073e-03 [ha/$]	High risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	📖 Eora 2015: GHG, Labor, a…
👥 Number of threatened species	3.23383841136607e-06 [# species/$]	Very high risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	📖 Eora 2015: GHG, Labor, a…
👥 Embodied water footprint	1.02151150137125e-03 [Mm3/$]	Very high risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	📖 Eora 2015: GHG, Labor, a…
👥 Embodied forest area footprint	0.00 [ha/$]	No risk	0.046852851119755 [h, work hours]	(1;2;2;1;2)	Year: 2015	📖 Eora 2015: GHG, Labor, a…
📁 Access to material resources						
👥 Extraction of biomass (related to area)	1759.83 [annual t/km2]	Very high risk	0.046852851119755 [h, work hours]	(2;1;1;1;5)	Year: 2017	📖 MF:Global Material Flows…
👥 Level of industrial water use (related to total withd	2.14 [% of total water withdrawal per year]	Very low risk	0.046852851119755 [h, work hours]	(2;1;5;1;5)	Original data; Year: 2008	📖 WB: Public spending on …
👥 Extraction of biomass (related to population)	1.54 [annual t/cap]	Very low risk	0.046852851119755 [h, work hours]	(2;1;2;1;5)	Year: 2015	📖 MF:Global Material Flows…
👥 Extraction of industrial and construction minerals	0.69 [annual t/cap]	Very low risk	0.046852851119755 [h, work hours]	(2;1;2;1;5)	Year: 2015	📖 MF:Global Material Flows…
👥 Extraction of fossil fuels	0.11 [annual t/cap]	Very low risk	0.046852851119755 [h, work hours]	(2;1;2;1;5)	Year: 2015	📖 Aquastat: Food and Agri…
👥 Level of industrial water use (related to renewable	0.02 [% of total actual renewable water reso…	Very low risk	0.046852851119755 [h, work hours]	(2;2;5;1;1)	Old Data; Year: 2002	📖 Aquastat: Food and Agri…
👥 Extraction of ores		No data	0.046852851119755 [h, work hours]			
👥 Certified environmental management systems		No data	0.046852851119755 [h, work hours]			
📁 Safe and healthy living conditions						
👥 Pollution level of the country	88.30 [Pollution Index]	Very high risk	0.046852851119755 [h, work hours]	(3;3;1;1;5)	Year: 2019	📖 Numbeo: Pollution Index…
👥 Drinking water coverage	61.40 [%]	Very high risk	0.046852851119755 [h, work hours]	(1;1;2;1;5)	Max of failed values; Year: 2…	📖 WB: Safely managed drin…
👥 Sanitation coverage	57.00 [%]	Very high risk	0.046852851119755 [h, work hours]	(1;1;4;1;5)	Year: 2012	📖 WHO/UNICEF: 2015
📁 Local employment						

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Activity variable

- Worker hours are applied (initially to all indicators) =

  - h/USD output for each process

- $Worker\ hours = \dfrac{Unit\ labour\ costs}{Mean\ hourly\ labour\ cost\ (per\ employee)}$

$$Unit\ labour\ costs = \dfrac{Compensation\ of\ employees\ (in\ USD\ per\ country-specific\ sector\ and\ year)}{Gross\ output\ (in\ USD\ per\ country-sector\ and\ year)}$$

- In another variant of the database, also a direct calculation is possible (see Ciroth, A., Di Noi, C. Srocka, M. (2019): Revisiting the activity variable in Social LCA – beyond worker hours, presentation, ACLCA XIX LCA, Tucson, Arizona, 24 Sept 2019)

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Example process in PSILCA: India, cotton production

⊡ Inputs/Outputs: Cotton - IN

▾ Inputs

Flow	Category	Amount	Unit
⊘ Energy Usage - Petroleum	Elementary flows/I-ENERGY	0.72054	MJ
⊘ Energy Usage - Natural Gas	Elementary flows/I-ENERGY	0.06169	MJ
⚙ Fertiliser manufacturing - IN	India/Commodities	0.05255	USD
⚙ Hotels and Restaurants - IN	India/Commodities	0.02750	USD
⚙ Other livestock products - IN	India/Commodities	0.02373	USD
⚙ Pesticides - IN	India/Commodities	0.02023	USD
⚙ Animal services (agricultural) - IN	India/Commodities	0.01870	USD
⊘ Energy Usage - Biomass and Waste Electricity	Elementary flows/I-ENERGY	0.01578	MJ

▾ Outputs

Flow	Category	Amount	Unit
⊘ Active involvement of enterprises in corruption and bribery; no data	Value Chain Actors/Corruption	0.41887	h
⊘ Certified environmental management systems; very low risk	Local Community/Access to material reso...	0.41887	h
⊘ Children in employment, female; very low risk	Workers/Child labour	0.41887	h
⊘ Children in employment, male; very low risk	Workers/Child labour	0.41887	h
⊘ Children in employment, total; very low risk	Workers/Child labour	0.41887	h
⊘ Contribution of the sector to economic development; medium opportunity	Society/Contribution to economic develop...	0.41887	h
⚙ **Cotton - IN**	**India/Industries**	**1.00000**	**USD**
⊘ Crop and pasture land, from FAO - Agricultural area	Elementary flows/FAO-LANDINPUTS	0.69738	m2
⊘ Crop and pasture land, from FAO - Agricultural area organic, total	Elementary flows/FAO-LANDINPUTS	0.00193	m2
⊘ Crop and pasture land, from FAO - Arable land	Elementary flows/FAO-LANDINPUTS	0.60732	m2
⊘ Crop and pasture land, from FAO - Arable land and Permanent crops	Elementary flows/FAO-LANDINPUTS	0.65761	m2
⊘ Crop and pasture land, from FAO - Country area	Elementary flows/FAO-LANDINPUTS	0.90316	m2
⊘ Crop and pasture land, from FAO - Inland water	Elementary flows/FAO-LANDINPUTS	0.08629	m2
⊘ Crop and pasture land, from FAO - Land area	Elementary flows/FAO-LANDINPUTS	0.81687	m2
⊘ Crop and pasture land, from FAO - Other land	Elementary flows/FAO-LANDINPUTS	0.12834	m2
⊘ Crop and pasture land, from FAO - Permanent crops	Elementary flows/FAO-LANDINPUTS	0.05029	m2
⊘ Crop and pasture land, from FAO - Total area equipped for irrigation	Elementary flows/FAO-LANDINPUTS	0.25918	m2
⊘ DALYs due to indoor and outdoor air and water pollution; medium risk	Workers/Health and Safety	0.41887	h
⊘ Drinking water coverage; very high risk	Local Community/Safe and healthy living ...	0.41887	h
⊘ Embodied agricultural area footprint; low risk	Local Community/Environmental Footprints	0.41887	h

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PSILCA: some more details on
the impact assessment

Life Cycle Impact Assessment

- Overall social impacts are calculated by aggregating the scaled social risks of all involved processes along the life cycle (product system):

→ Scaled by price (inputs), amount of worker hours and impact factors

- To some extent, PSILCA can be also used in the environmental context by selecting respective indicators:

→ e.g. health and safety, GHG footprints, resource use, etc.

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Environmental indicators

Social aspects: Other Manufactures - BA
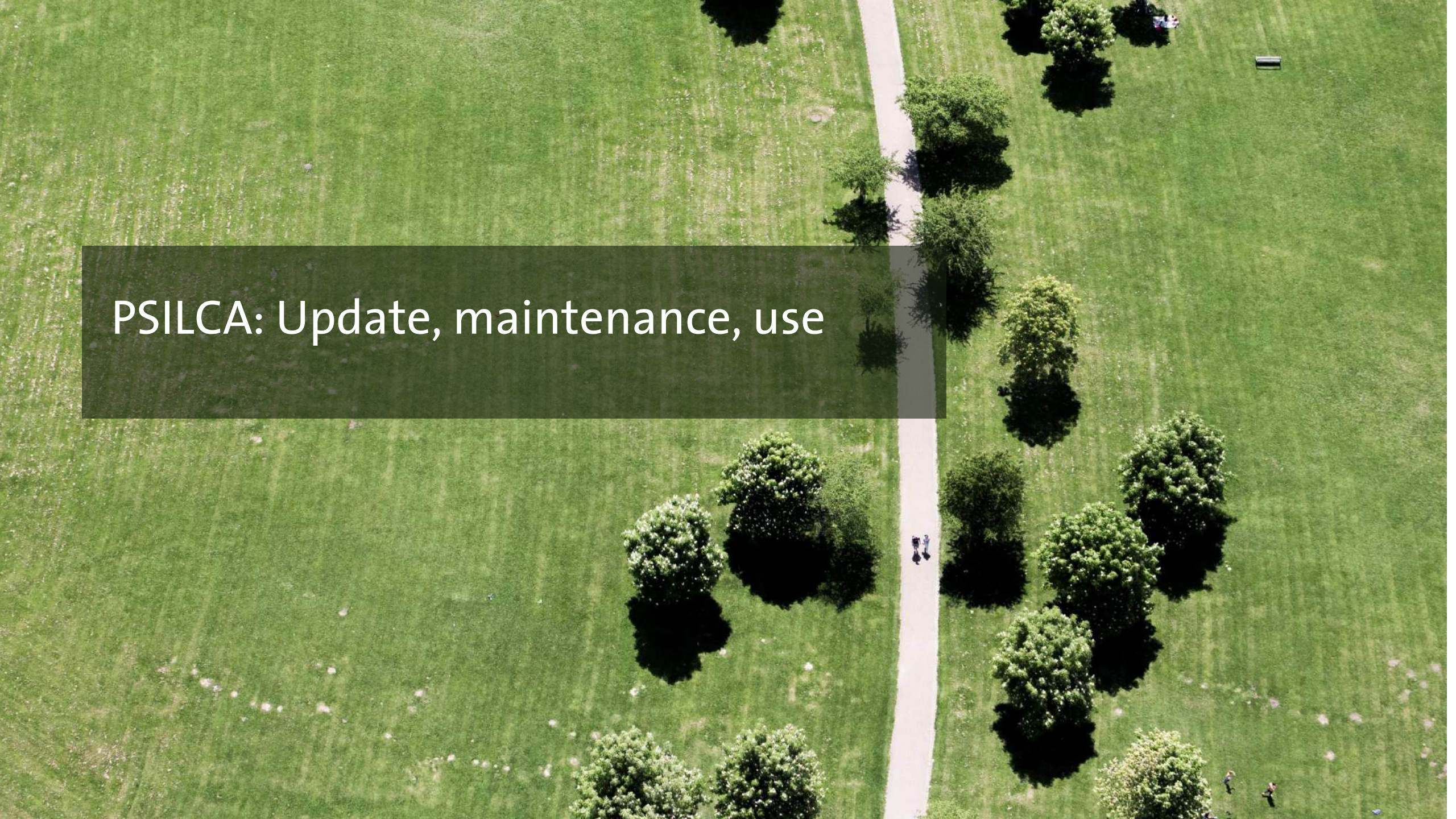
Social assessment

Name	Raw value	Risk level	Activity variable	Data quality	Cor
Certified environmental management systems	1.612903e-03 [# of CE...	High risk	0.031284473850908 [h, ...	(1;2;1;1;2)	Yea
∨ Safe and healthy living conditions					
Drinking water coverage	88.50 [%]	Medium risk	0.031284473850908 [h, ...	(1;1;2;1;5)	Ave
Pollution level of the country	63.47 [Pollution Index]	High risk	0.031284473850908 [h, ...	(3;3;1;1;5)	Yea
Sanitation coverage	23.00 [%]	Very high risk	0.031284473850908 [h, ...	(1;1;2;1;5)	Yea
∨ Migration					
International Migrant Stock	0.91 [%]	Very low risk	0.031284473850908 [h, ...	(2;2;2;1;5)	Yea
Net migration rate	-0.40 [%o]	Very low risk	0.031284473850908 [h, ...	(2;2;1;1;5)	Yea
Immigration rate		No data	0.031284473850908 [h, ...		
Emigration rate		No data	0.031284473850908 [h, ...		
Number of asylum seekers in relation to total population		No data	0.031284473850908 [h, ...		
International migrant workers in the sector		No data	0.031284473850908 [h, ...		
∨ Environmental Footprints					
Embodied agricultural area footprint	0.00 [ha/$]	No risk	0.031284473850908 [h, ...	(1;2;2;1;2)	Yea
Number of threatened species	2.61231714559318e-07...	High risk	0.031284473850908 [h, ...	(1;2;2;1;2)	Yea
Embodied water footprint	0.00 [Mm3/$]	No data	0.031284473850908 [h, ...		Yea
Embodied forest area footprint	0.00 [ha/$]	No risk	0.031284473850908 [h, ...	(1;2;2;1;2)	Yea
∨ Respect of indigenous rights					
Presence of indigenous population	0.00 [Y/N]	No risk	0.031284473850908 [h, ...	(3;1;5;1;5)	Yea
Indigenous People Rights Protection Index		No data	0.031284473850908 [h, ...		
∨ Local employment					
Unemployment rate in the country		No data	0.031284473850908 [h, ...		
∨ GHG Footprints					
Embodied CO2 footprint	2.50859705601373e-19...	Low risk	0.031284473850908 [h, ...	(1;2;2;1;2)	Yea
Embodied CO2-eq footprint	1.51104251931738e-64...	Very low risk	0.031284473850908 [h, ...	(1;2;2;1;2)	Yea
∨ Society					
∨ Health and Safety					
Life expectancy at birth	76.43 [Years]	Very low risk	0.031284473850908 [h, ...	(2;1;1;1;5)	Dat
Health expenditure, domestic general government	70.78 [% of total healt...	Low risk	0.031284473850908 [h, ...	(2;2;1;1;5)	Yea
Health expenditure, out-of-pocket	28.68 [% of total expen...	Medium risk	0.031284473850908 [h, ...	(2;2;1;3;5)	Yea

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LCIA Characterization factors

The following factors are usually used:

Risk level	Factor
Very low risk	0.01
Low risk	0.1
Medium risk	1
High risk	10
Very high risk	100
No risk/ opportunity	0
Low opportunity	0.1
Medium opportunity	1
High opportunity	10
No data	0.1

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PSILCA: Update, maintenance, use

PSILCA update and maintenance

PSILCA update and maintenance

- LCA Software

  - openLCA:

    - demanding database -> improved calculation speed, memory handling, ...

    - Social aspects as new element in the software, with raw values

    - Social data quality as new element in the software

    - ...

  - SimaPro (different software provider, not GreenDelta), some interest, therefore SimaPro version somewhat limited (no social aspect, no data quality, memory issues)

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PSILCA update and maintenance

- eora

  - Annual updates

  - Stable structure (sectors)

  - Some delays until real world changes are visible in the database due to reliance on official statistics

Eora heatmap, https://worldmrio.com/heatmap/

GReeNDeLTa
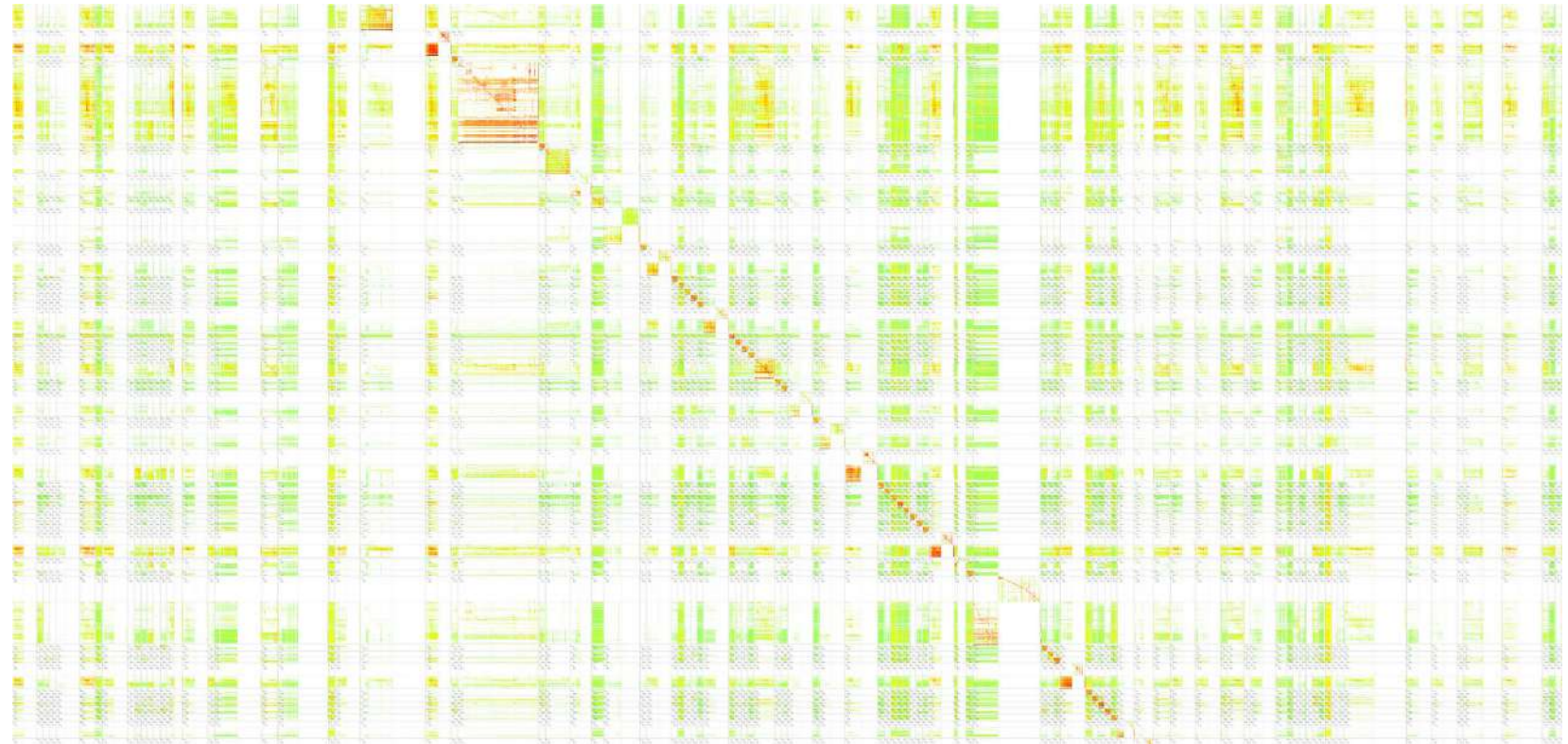
PSILCA update and maintenance

- Social indicators

  - Many renowned official sources (ILO, WHO, OECD, UNSTAT, ...), with own maintenance and update schedule

  - Own studies and own research, published literature (own schedule)

  - Upcoming, but slow: External contributions (new indicators, updates on countries or sectors, more specific or broader information) -> include

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PSILCA v.3.1 release: manual

- Documentation for the database and each indicator collection and assessment

openLCA Nexus

Your source for LCA and sustainability data.

Databases

EN15804 add-on
ecoinvent
UVEK LCI Data
The Evah Pigments Database
LCA Commons (complete)
IDEMAT
Carbon Minds
IMPACT World+

PSILCA

| Info | Details | Use advice | Doc |

psilca_direct_calculation.txt (1.6 KB)
PSILCA_manual_v3_1_1_2.pdf (9.2 MB)

https://nexus.openlca.org/database/PSILCA

PSILCA v. 3.1

A Product Social Impact Life Cycle Assessment database

Documentation
March 2023

GreenDELTa
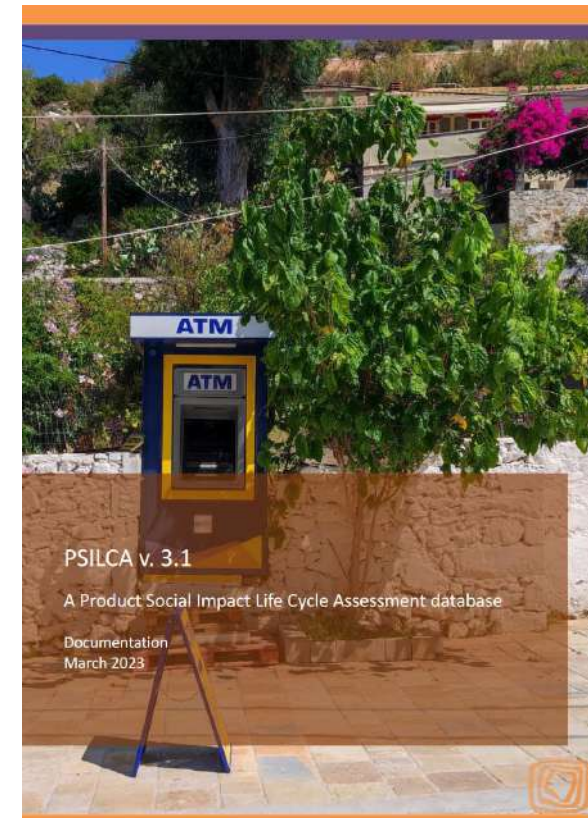
PSILCA v 3.1 manual/2

- For each indicator:

- Description

- Data collection and attribution

- Risk assessment

- Changes to previous PSILCA version

4.1.3.3   Sector average wage, per month

Sector average wage provides information about the mean monthly salaries in different industry sectors and countries and assesses if the salary is enough to afford a decent standard of living. The indicator is given as the mean of monthly earnings of all employees in the sector. These data are defined as follows:

"The earnings of employees relate to the gross remuneration in cash and in kind paid to employees, as a rule at regular intervals, for time worked or work done together with remuneration for time not worked, such as annual vacation, other type of paid leave or holidays. Earnings exclude employers' contributions in respect of their employees paid to social security and pension schemes and also the benefits received by employees under these schemes. Earnings also exclude severance and termination pay." (ILO 2017, "Mean nominal monthly earnings")

Values are provided in nominal terms and, therefore, are no indication for the purchasing power of employees. The unit of measurement is USD.

Data collection and attribution

Data is based on the indicator "Mean nominal monthly earnings of employees by sex and economic activity (Local currency)" from ILOSTAT database (ILO 2019). Depending on the country, information is provided for ___ industry sectors according to ISIC and is disaggregated by sex.

____ earnings") values are not always given per month but often per ____ It is even not consistent within

Risk assessment: Risk that salary is too low to permit a dignified life

The mean earnings were put into relation with living wages in the country (see chapter 4.1.3.1). If living wages were not available, prevailing minimum wages were taken as a reference (see chapter 4.1.3.2). For the remaining countries a mean living wage was calculated across all the corresponding country groups. In every case it is quoted which value was taken as a reference.

Ratios were calculated dividing the sector average wage by the (mean) living or minimum wage in the same country. To simplify risk assessment, it is assumed that minimum wages are equal or higher than living wages (which is true for more than half of the cases).

Since the selected living wages refer to the cost of living for an individual in the cheapest part of the country (see chapter 4.1.3.1) it is assumed that employees earning merely the living wage (i.e. a ratio lower than 1) face a very high risk of not being able to live a decent life. Only salaries that are at least twice as high as the living wage are supposed to permit a decent standard of living also for other family members and allow to cover increased or unexpected costs.

The following risk scale is used to assess the average monthly salaries.

Indicator value y, ratio Salary/Liv. wage or Salary/Minim. wage	Risk level
0 < y < 1	very high risk
1 ≤ y < 1.5	high risk
1.5 ≤ y < 2	medium risk
2 ≤ y < 2.5	low risk

eLTa

PSILCA use

- Quite an uptake, hundreds of users

- Heavy database but somehow unique, the only transparent database in the field

- Using database alone rather straightforward (also depending on software)

- Linking to own data:

  - Consistent indicators,

  - (Consistent modeling assumptions)

- Interpreting risk values and outcomes in general is different from "standard" LCA databases, and requires openness from user (social assessments are not natural science)

- Combining with other sustainability dimensions requires thoughts

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Thank you!

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