Social sustainability in raw materials sectors

Content

This document presents an indicator under consideration for the 2018 Raw Materials Scoreboard, which was not included in this edition due to the current limitations of the data (as explained hereafter).

Why considering this topic?

- **Relevance:** Ensuring a sustainable production of raw materials, both from domestic and external sources, is a priority within the European strategy on raw materials. The social dimension of sustainability has gained more and more importance over the last years, and is promoted by several UN Sustainable Development Goals (Goal 1 No poverty, Goal 8 Decent work and economic growth, Goal 10 Reduced inequalities, etc.).

  The concept of social sustainability encompasses a broad range of social issues, which can affect different stakeholders. In the case of raw materials, fair working conditions, occupational health and safety, safe and healthy living conditions and territorial rights for local communities, or local employment are of high importance. Social sustainability of raw materials production, trade and consumption is also of high policy relevance in the context of e.g. conflict minerals and trade policies.

  The legislation and governance of the countries where companies operate can influence the social performance of organizations. Thus, high levels of raw materials import reliance from countries with failing governance, fragile and corrupt state might imply a shifting of social burdens to extra-EU regions.

- **Indicator:** The Raw Materials Scoreboard comprises two indicators related to social sustainability (Occupational Safety and Sustainability Reporting). This document proposes a set of metrics on social risk[1], based on a macro-scale, life-cycle analysis of supply chains.

- **Data source:** Results shown in this document come from a JRC Technical Report[2]. In this study, social indicators on country-sectors combinations are combined with a database on economic flows, representing sectors interdependencies in the global economy (i.e. Multiregional Input-Output tables[3]). Social risk is assessed at country and sector-level, for a set of relevant social impact categories, each comprising a set of indicators. The EU raw materials sectors (as average of the 28 member states) are compared with six non-EU

[1] Social sustainability assessment include both negative and positive impacts (or risk and opportunities). However, the definition of "positive impact" is still under discussion and therefore is left out from this analysis, which focus on social risks.

[2] Mancini L, Eynard U, Eisfeldt F, Ciroth A, Blengini GA, Pennington D., 2018 'Social risk in raw materials supply chains. A life-cycle based analysis'. JRC Technical Report; (forthcoming).

[3] Lenzen M, Moran D, Kanemoto K, Geschke A. (2013) Building Eora: a global multi-region input–output database at high country and sector resolution. Econ Syst Res. Taylor & Francis;;25(1):20–49.

countries. Being a life cycle-based assessment, social risk results encompass also the upstream phases of the supply chain.

- **Limitations**: Data on social aspects are not always specific for the sector (for instance, child labour data are country-based estimates), or refer to broader sectors (for instance the mining and quarrying includes also energy materials). Time series data are not yet available; social data refer to the most updated available figure, which range from 2008 and 2015. The combination of the social inventory with an Input-Output model increases the associated uncertainty.

Key points

- The raw materials industries are exposed to several social risks, which can affect different stakeholders, like workers, other actors in the value chain, local communities and societies.
- Overall, the EU raw materials sectors show a good social performance, especially in the manufacturing and forestry and logging sectors.
- Between the analysed impact categories, fair salary, corruption, freedom of association and collective bargaining are those with the highest risk.
- Most of the overall social risks originates from upstream sectors in the supply chain placed in non-EU countries.

Facts and figures

- Figure 1 presents the social risk in six impact categories associated to four economic sectors[4]: mining and quarrying, forestry and logging, manufacture of metals, and manufacture of paper. Each impact category regards a social aspect that has been judged as relevant for the raw materials industries by the authors, and which affects different stakeholders (specified in brackets)[5]. Results include the direct impact of the sectors under investigation and the impact originated from their supply chains. The figure compares the average performance of EU-28 with a set of non-EU countries (Australia, Brazil, China, Russia, South Africa and the USA, in the graph expressed in letters). Results are expressed in social impact units (specifically called *medium risk hours*)[6], which represent the number of worker hours along the supply chain that are characterized by a certain social risk. High values of medium risk hours correspond to higher risk (and lower social performance).
- The figure shows that the average EU social performance is high for most sectors and social categories under investigation. This can be explained by the stronger role of social dialogue

[4] Data on social aspects underpinning this assessment often are not specific for the metals and minerals mining, but refer to the extractive sector as a whole, thus including also fossil fuels and energy materials.
[5] See methodological notes for the full set of indicators, units of measurement, and data sources used for the assessment. The choice of relevant impact categories for the raw materials industries is discussed in Mancini et al. (2018).
[6] Unit of measurement of social risk in the PSILCA modelling. See methodological notes.

and social protection policies in Europe, which ensure, in general, better working conditions and freedom of association and bargaining. Furthermore, conflicts with indigenous populations are less common in the EU as their presence is limited, compared to other non-EU countries. The level of governance and economic development seem to be related to the social performance, as social risk is higher on average in countries ranking low in World Governance Indicators[7] and in Human Development Index[8].

- Compared to other sectors in the EU, mining and quarrying (which includes also the mining of energy materials) shows higher levels of social risk for the categories "health and safety", "freedom of association and collective bargaining" and "corruption". In the case of corruption, background data is based an OECD analysis of foreign bribery[9]. This study showed that, globally, the extractive industry (including also energy) had the highest share of bribery cases between the sectors under investigation. Unfortunately, these figures are not disaggregated by country/region.

[7] http://info.worldbank.org/governance/wgi/#home.
[8] http://hdr.undp.org/en/content/human-development-index-hdi
[9] OECD (2014), OECD Foreign Bribery Report: An Analysis of the Crime of Bribery of Foreign Public Officials, OECD Publishing, Paris, https://doi.org/10.1787/9789264226616-en.

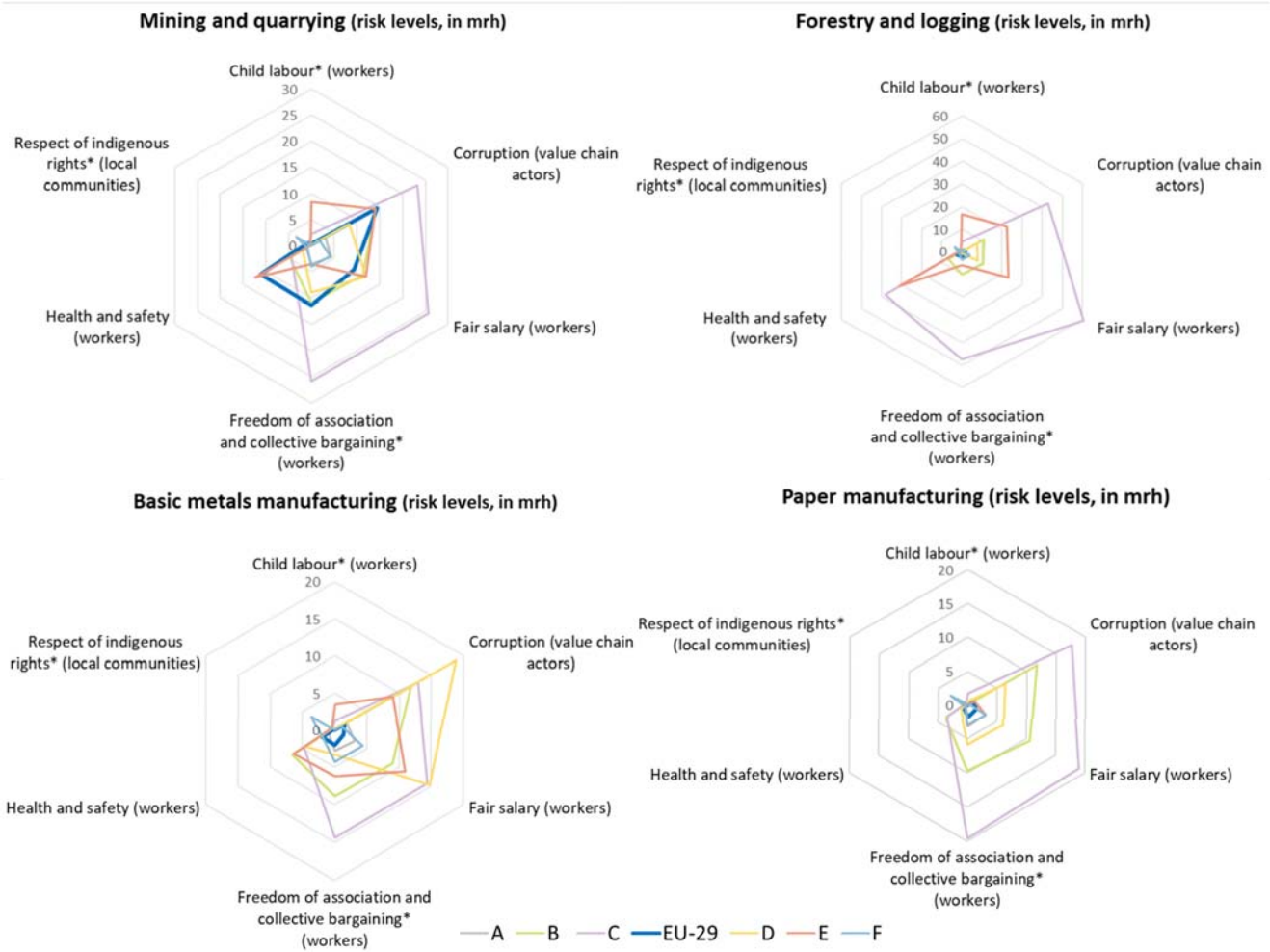

Figure 1: Comparison of social risks in raw materials sectors in EU-28 and in selected non-EU countries (expressed in letters). Data range between 2008 and 2015[10]. Values are expressed in medium risk hours (mrh) per 1$ output[11]. Impact categories with * do not include any sector-specific indicator (but only country-specific).

[10] Source: JRC elaboration based Mancini et al. (2018). See methodological notes for further details.

[11] In PSILCA, social risk is measured in medium risk hours per 1$ output, which is the number of worker hours along the supply chain that are characterized by a certain social risk. Therefore, higher values correspond to higher risks (i.e. more negative performance). See methodological notes for further details.

- Figure 2 shows the contribution of upstream phases in the supply chain to the overall risk. In the EU mining and quarrying sector (which is the most critical in terms of social risk, among the EU sectors), this contribution is higher than 90% in all the impact categories. This means that most of the risk originates from the upstream phases of the supply chain (i.e. the sectors providing inputs to mining). In the case of forestry and manufacturing sectors, the share of indirect risk (from upstream phases in the supply chain) is much lower, especially for the category health and safety (less than 50% in forestry and logging sector and less than 60% in the manufacturing sector).

Figure 2: Share of social risks of the EU-28 mining and quarrying sector and contribution of upstream sectors (indirect risk) (Impact categories with * do not include any sector-specific indicators, but only country-specific).

The search for suitable data…

- In general terms, the quantitative assessment of social aspects is challenging, due to the complex nature of social phenomena and the lack of data on many social aspects (especially sector-specific ones).
- To perform this analysis, we used PSILCA (Product Life Cycle Impact Database), a commercial database developed by the German company GreenDelta (see methodological notes for details).
- PSILCA provides a transparent and updated documentation on the data quality for all units of observation[12].

[12] Eisfeldt, F. (2017) PSILCA – A Product Social Impact Life Cycle Assessment database Database version 2.1. Documentation. More information under: www.PSILCA.net.

- The sources of uncertainty characterizing the study are discussed in the methodological notes and in the JRC report Mancini et al. (2018).

Methodological notes

- **Name of the indicator:** Social sustainability in the raw materials sectors.
- **Organization (data provider):** Results come from the JRC technical report Mancini et al. (2018). The data underlying this assessment come from the database PSILCA (Product Social Impact Life Cycle Assessment) which includes two different modules:
  - A social inventory, including social data for sectors and countries. These data are collected mostly from recognized official statistical agencies, like ILOstat, WHO or World Bank, and from recognized public or private sources, like the CTWSS[13] by the University of Amsterdam, or the World Factbook. The social inventory was taken from the commercial database PSILCA (Product Social Impact Life Cycle Assessment), developed by the company GreenDelta. Social risk results based on those data were calculated using the Software OpenLCA, developed by the same company. Table 1 (below) lists the data sources and unit of measurement for each social data.
  - A multi-regional input/output (MRIO) database, called Eora[14]. In this framework, a monetary unit of output from one sector in a country (e.g. 1$ output of mining in Australia) is associated with the values of inputs provided by other sectors and countries. Eora contains data for around 15,000 sectors and 189 countries. 2011 is used as reference year, it does not provide time series.
- **Website (URL):** https://www.greendelta.com/ (PSILCA developers).
- **Definition, description of data**: This document shows the results of an assessment of social risk, based on a life cycle analysis and MRIO data. Results come from the JRC technical report Mancini et al. (2018). Results show a set of social risks, encompassing a set of indicators inherent to the social conditions of workers, local communities and value chain actors. The following social risks, classified by stakeholder affected, are covered:
  - For the stakeholder "workers":
    - *Health and safety*: it concerns occupational health and safety conditions combining five different indicators. It comprises the risk of fatal and non-fatal accidents at work, the risk of health problems and the loss of life years due to pollution at the workplace, the presence of sufficient safety measures and the risk for workers to be affected by natural disasters.
    - *Child labour*: it includes an indicator on the percentage of male and female children (age between 7 and 14) in employment.

[13] Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 51 countries between 1960 and 2013.
[14] Lenzen M, Moran D, Kanemoto K, Geschke A. Building Eora: a global multi-region input–output database at high country and sector resolution. Econ Syst Res. Taylor & Francis; 2013;25(1):20–49.

- *Fair salary*: it assesses, through three indicators, whether the effective wage paid complies with minimum wage standards and is high enough to permit a dignified life.
- *Freedom of association and collective bargaining*: it assesses with a set of four indicators if fundamental rights of workers concerning social dialogue and representativeness are ensured.

- For the stakeholder "local communities":
  - *Respect of indigenous rights*: using two indicators, it assesses the risk that economic activities can endanger the livelihood and human rights of indigenous populations.
- For the stakeholder "value chain actors":
  - *Corruption*: using two indicators, it assesses the risk of bribery and corruption in countries and sectors.

Indicators composing each category and data sources are listed in Table 1.

Stakeholder	Impact Category	Indicator	Unit of measurement	Sector Specific data	Main data sources
Workers	Health and Safety	Rate of non-fatal accidents at workplace	Cases per 100,000 employees and year	x	ILOstat 2017
		Rate of fatal accidents at workplace	Cases per 100,000 employees and year	x	
		DALYs due to indoor and outdoor air and water pollution	DALYs per 1,000 inhabitants in the country		WHO 2009
		Presence of sufficient safety measures	OSHA cases per 100,000 employees in the sector	x	United States Department of Labor (USDOL) 2014: Occupational Safety and Health Administration (OSHA)
		Workers affected by natural disasters	Affected persons as % of whole population between 2012 and 2014		EM-DAT - The International Disaster Database 2015
	Child labour	Child labour, total	% of all children ages 7-14		World Bank 2017
	Fair salary	Living wage, per month	USD		WageIndicator 2017; Quandl 2014
		Minimum wage, per month	USD		
		Sector average wage, per month	USD	x	ILOstat 2017
	Freedom of association and collective bargaining	Trade union density	% of employees organised in trade unions		ILOstat 2017
		Right of Association	score of ordinal 0-3 scale		University of Amsterdam: ICTWSS: Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 51 countries between 1960 and 2013
		Right of Collective bargaining	score of ordinal 0-3 scale		
		Right to strike	score of ordinal 0-3 scale		
Local Communities	Respect of indigenous rights	Presence of indigenous population	Y/N		Wikipedia 2017; Office of the United Nations High Commissioner for Human Rights (OHCHR) 2015; ILO 1989: Indigenous Peoples Convention; UN Declaration of indigenous rights; United Nations Department of Economic and Social Affairs (UN-DESA)
		Human rights issues faced by indigenous people	Score		
Value Chain Actors	Corruption	Public sector corruption	Score (Corruption Perceptions Index score of the country)		Transparency International 2012
		Active involvement of enterprises in corruption and bribery	% of sector-related cases out of all registered foreign bribery cases	x	OECD 2014

Table 1: List of stakeholders, impact categories, indicators, units of measurement and main data sources used for the assessment of social risks.

- **Update frequency:** PSILCA does not provide time series, and the database shows the most recent figures available (not homogenous among indicators).
- **Data format:** PSILCA has the format "zolca" and can be used in LCA software.
- **Geographic coverage:** Our assessment focus on EU (as average of the 28 member states) and on six non-EU countries (Australia, Brazil, China, Russia, South Africa and the USA). As in PSILCA data are available for 189 countries, the analysis could be extended to other countries and sectors.
- **JRC processing methodology:** Figure 3 depicts the modelling approach used in this analysis, i.e. how the two modules described above are combined together to provide the overall risk hours in a certain supply chain.

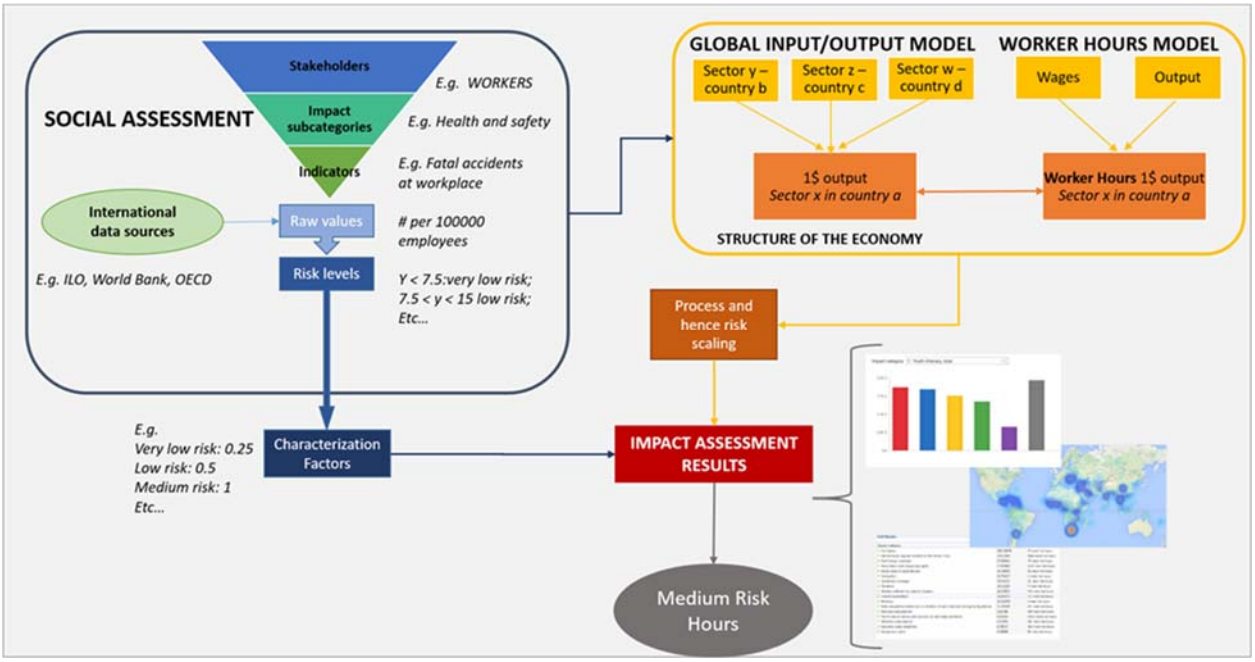

Figure 3: Components of the PSILCA database and modelling approach.

In the model, input/output data are combined with social data on a set of indicators (representing a range of social aspects). The social performances of country-sectors in each indicator are converted in risk levels using specific risk assessment schemes. The risk levels are quantified assigning a numerical factor for each level of risk (for instance, assigning 0.1 for low risk and 100 to high risk).

The aggregation of risk values along the value chain is performed scaling each country-sector based on its contribution to the final unit of output. This contribution is computed as amount of work (worker hours) provided by each country-sector. Workers hours therefore reflect the share of each country-sector and its relevance on the impact associated.

Strictly speaking, worker hours are only related to the stakeholder workers. Nevertheless, they are applied to all indicators, also those not related to labour conditions.

Results are expressed as medium risk hours per 1$ of output, representing the number of worker hours along the supply chain that are characterized by a certain social risk.

Concerning the EU-28 region, social risk originating from different EU countries is aggregated and weighted according to the country share of the total EU production value, for each sector[15].

The selection of the impact categories set was based on different criteria regarding the relevance of the categories for the Scoreboard purposes, and on the availability and quality of data in PSILCA.

[15] No specific values were available for the sector "Forestry and Logging". Hence, values from "Manufacture of paper and paper products" were used for the aggregation.