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23. Life cycle sustainability management in policy frameworks – responsible sourcing

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INTRODUCTION TO RESPONSIBLE SOURCING (RS)

Over the last decade, the discourse on responsible sourcing (RS) has garnered widespread attention from both policy makers and businesses alike. Irresponsible mining practices negatively impacting working conditions or the environment (RMF, 2020), as well as violation of workers’ rights or hazardous working conditions in manufacturing complexes (Farooki, 2020; Young, 2018; Young et al., 2019), are key challenges for companies to consider in their upstream supply chains. Therefore, several international organizations and governments have started to introduce guidelines or standards¹ for companies to follow up on their environmental and social responsibility beyond their own operations. The actions recommended by the guidelines or standards consider the origin and conditions of production of the sourced materials, which constitutes the foundation of RS practice. The European Union (EU), in particular, has developed different tools, such as regulations (e.g. Conflict Minerals Regulation), directives (e.g. Non-financial Reporting Directive), and multi-stakeholder actions and frameworks (i.e. RE-SOURCING, a ‘Multi-Stakeholder Platform that aims to advance Responsible Sourcing’,² European Raw Materials Alliance), that in many ways coerce and encourage companies to adhere to RS practices.

As van den Brink et al. and others (Farooki, 2020; van den Brink et al., 2019) describe, there is no commonly accepted definition and operationalization of RS. Table 23.1 shows the definitions proposed in literature, where the focus is on management of social and environmental impacts, management of supply chain or engagement with local communities (in the definition by Deberdt and Le Billon, 2021).

Table 23.1 List of definitions of responsible sourcing found in literature

Author and year	Definition of responsible sourcing
International Chamber of Commerce (2008)	‘Company’s voluntary commitment (going beyond legal compliance) to consider social and environmental impacts when managing their relationships with suppliers’
BS 8902 (2009)	‘... the management of sustainable development in the provision or procurement of a product’
van den Brink et al. (2019)	‘The management of social, environmental and/or economic sustainability in the supply chain through production data’
ISO 20400 (2017)	‘Procurement that has the most positive environmental, social and economic impacts possible over the entire life cycle (consecutive and interlinked stages of a goods or services system), from raw material acquisitions or generation from natural resources to final disposal’
Deberdt and Le Billon (2021)	‘Responsible sourcing is integral to many firms’ corporate social responsibility (CSR) and constitutes the backbone of due diligence and subsequent engagement with communities along the supply chain (with a frequent focus on communities around extraction sites)’

Although the term RS is widely used, its interpretation and use varies greatly among practitioners in business, public policy, civil society and academia and across different material and mineral value chains (Kügerl et al., 2023).

Despite the lack of a single, agreed-upon definition and common ground for interpretation, challenges for companies to practise RS remain similar across material supply chains and sectors. These challenges manifest themselves on the operational, governance/strategic and market levels, and include 1) the complexity of global value chains as well as the material complexity of products, which makes it difficult to collect and process supplier and production data across several supply tiers, 2) the verification of suppliers' and whole value chains' adherence to, for example, environmental or labour standards, 3) the multi-dimensionality and heterogeneity of RS concepts and practices (besides already established human rights considerations, more recent approaches also include environmental or labour standards), and 4) global market competition without a level playing field to compensate for competitive disadvantages, which requires individual action by front-running companies and associations.

New technological solutions such as blockchain or supplier network databases for whole mineral value chains are ways to increase transparency across supply chains and suppliers to mitigate those challenges. Furthermore, numerous multi-stakeholder initiatives in different material value chains³ or industry sectors⁴ have recently developed new standards, guidelines or supporting tools for companies to identify, assess and mitigate risks and, therefore, facilitate due diligence in their upstream supply chains. Due diligence is defined as a process that businesses can carry out to manage risk and identify and respond to real and potential negative impacts related to their own operations as well as throughout their supply chains (OECD, 2018a).

The current discourse on RS is characterized by a transition and by a consolidation along two lines. Firstly, a shift from voluntary to mandatory action. This means moving away from voluntary and business-driven approaches towards stricter governmental interventions to regulate companies in order to get them to practise due diligence in their supply chains (i.e. German Supply Chain Act, French Duty of Vigilance Law, and other national movements for mandatory due diligence).

Secondly, an extension of the focus from only social and human rights to environmental and economic considerations as well. While the original discourse was heavily focused on social and human rights issues, there is now also widespread attention towards environmental impacts with regard to, for example, greenhouse gas emissions and biodiversity loss (Schilling-Vacaflor and Lenschow, 2023; Krajewski et al., 2021; Mackie, 2021). Likewise, the interlinkage of RS with resilient supply chains is receiving increasing attention in order to secure the required raw materials for the European green energy and digital transition (Kügerl et al., 2023; Lee et al., 2020). This concerns, among other topics, aspects of raw materials traceability and the minimization of sustainability risks that could lead to supply chain disruptions.

In the context of sustainability science, Life Cycle Sustainability Assessment (LCSA) aims at assessing the environmental, economic and social implications of the whole supply chain of products through Life Cycle Assessment (LCA), Life Cycle Costing (LCC) and Social Life Cycle Assessment (S-LCA). Despite the different levels of methodological development of the three techniques, LCSA represents a promising approach for developing a transparent, robust and comprehensive assessment (Sala et al., 2013). See more on LCSA, LCA, LCC and S-LCA in chapters 5, 6, 7 and 8, respectively.

The following sections will more closely look at recent developments in corporate due diligence and RS as well as in public policy. By outlining the larger business and policy context in terms of international standards and guidelines as well as current legislation on RS, the foundations are provided for a more thorough investigation of commonalities and differences between RS and LCSA, which can further the academic discourse and provide insights for practitioners in policy-making and business alike. Additional discussion on application in policies in can be found in Chapter 24 and in businesses in chapters 20, 21 and 22.

INTERNATIONAL STANDARDS AND TECHNICAL GUIDANCE ON RESPONSIBLE BUSINESS CONDUCT

In 2011, the United Nations (UN) published the *Guiding Principles for Business and Human Rights* (UNGP) (UN, 2011), which underpin the recognition of a state's duty to protect human rights and the role of business in conducting human rights due diligence to 'identify, prevent, mitigate and account for present and potential human rights impacts' (ibidem, p. 17). The voluntary approach by UNGP has been heavily criticized regarding companies' uptake and interpretation of human rights due diligence (e.g. Bonnitcha and McCorquodale, 2017). Ten years later, a report of the Working Group on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises (UN Human Rights Council, 2021) reflected on the implementation of the UNGP, including in relation with the UN Framework on Sustainable Development Goals (UN General Assembly, 2015). The report recognizes the persistence of business-related abuses and the insufficiency of voluntary measures alone.

The UNGP are aligned with and/or incorporated in other well-established international standards, such as the ISO 26000 standard on social responsibility (ISO 26000, 2010), the UN Global Compact (2014) and the International Labour Organization's (ILO's) revised 2017 *Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy* (ILO, 2017).

The *OECD Guidelines for Multinational Enterprises* (OECD, 2011), which are non-binding recommendations addressed to multinational enterprises on responsible business conduct (RBC), are also in line with the UNGP and the ILO Tripartite Declaration. The OECD Guidelines for RBC are complemented by the OECD due diligence guidance (DDG) (OECD, 2018a), which supports companies in implementing RBC. The guidance, besides presenting general principles and policies on due diligence, takes into account the following areas: disclosure; human rights; employment and industrial relations; environment; bribery and corruption; consumer interest; science and technology; competition; and taxation.

The OECD RBC recommendations are further articulated in sector-specific due diligence guidance for minerals, agricultural, textile and garment, financial and extractive sector stakeholder engagement. Each set of guidelines addresses the specific risks of, for example, human rights abuses, poor working conditions or corruption, and focuses on the most salient issues in that sector.

PUBLIC POLICY MANDATING DUE DILIGENCE AND RESPONSIBLE SOURCING IN MINERAL SUPPLY CHAINS

Concerning RS in mineral supply chains, the first regulation to specifically address the issue was Section 1502 of the Dodd–Frank Wall Street Reform and Consumer Protection Act, enacted in the United States in 2010. The regulation requires trading companies to determine whether any of the Tin, Tungsten, Tantalum and Gold (3TG) used in their products is financing or benefiting illegal armed groups in the Democratic Republic of the Congo (DRC) or an adjoining country by carrying out supply chain due diligence. Since then, several governments as well as civil society initiatives have campaigned for stricter human rights due diligence and more responsible business conduct. This trend has led to the instigation of regulatory requirements by several other governments.

Today, several countries have legislation in place requiring mandatory human rights due diligence for medium and large companies. For instance, France launched its supply chain legislation in 2017 with the ‘Duty of Vigilance Act’ (Loi de Vigilance); the Dutch adopted the legislation ‘Child Labour Due Diligence Act’ (Wet Zorgplicht Kinderarbeid) in 2019; and the ‘Act on Corporate Due Diligence in Supply Chains’ entered into force in 2023 in Germany.

At the EU level, on December 2023, the European Council and Parliament agreed on a proposal (European Commission, 2022) for a Directive for Corporate Due Diligence and Corporate Accountability, with the aim of fostering sustainable and responsible corporate behaviour and to anchor human rights and environmental considerations in companies’ operations and corporate governance (European Commission, 2023).

Concerning minerals supply chains, the EU passed the ‘Conflict Minerals Regulation’ in 2017 (EU 2017/821), which entered into force on 1 January 2021. The EU Regulation lays down supply chain due diligence obligations for Union importers of 3TG originating from Conflict-Affected and High-Risk Areas (CAHRAs). This Regulation requires that due diligence be carried out according to the international guidelines of the OECD guidance (OECD, 2013). The objective is to ensure that in the EU international and European importers of 3TG source responsibly, to help break the link between conflict and the illegal exploitation of minerals and also to support local development, stopping exploitation and abuse of local communities, including mine workers.

Given that several supply chain due diligence initiatives are in place, in order to facilitate compliance the European Commission has set a methodology and criteria for the recognition of supply chain due diligence schemes in accordance with the OECD’s methodology for assessing the alignment of multi-stakeholder or industry initiatives with the OECD due diligence guidance. The European Commission also proposed to apply RS requirements to minerals used in batteries under the so-called Battery Regulation (i.e. lithium, cobalt, nickel and natural graphite) (European Commission, 2020). The objective is to ensure that the transition to a low-carbon and digital economy is not fuelling human rights abuses and other severe social impacts in resource-rich countries.

RELATIONSHIP BETWEEN RS AND LCSA

As previously explained, a single definition of responsible sourcing does not exist, and depending on the sector or mineral supply chain, corporate due diligence procedures identify and assess different risk areas.

Concerning the coverage of impact/risk categories, Table 23.2 shows that some risks – child labour, forced labour, human rights, and bribery and corruption – are included in all OECD sectorial guidance, while others are specific for each sector. The OECD minerals supply chains guidance includes specific aspects for conflict and high-risk areas, like the risk of supporting non-state armed forces and the risk of misdeclaration of the origin of minerals (OECD, 2013). Unlike other supply chains, environmental impacts, gender issues and health and safety are not included in the guidance for minerals supply chains. Moreover, in the latter the risk of child labour focuses on ‘worst forms of child labour’.⁵

Life Cycle Sustainability Assessment (LCSA) consists in the evaluation of environmental, social and economic negative impacts and benefits along value chains, typically informing decision-making processes (Valdivia et al., 2013). Encompassing the three pillars traditionally included in the sustainability concept (environment, society, economy), LCSA combines the three techniques of (environmental) Life Cycle Assessment (LCA), Social Life Cycle Assessment (S-LCA) and Life Cycle Costing (LCC) to provide information on the sustainability performance of the assessed product (good or service) thus enabling Life Cycle Sustainability Management (Mazijn and Revéret, 2015). The three techniques have reached different levels of development, with LCA being the most advanced one in terms of methodological robustness and implementation.

The LCC technique, which emerged as part of the sustainability debate after being used in other contexts, encompasses different types of economic assessment and can include internal economic costs only or add environmental and social externalities (Bianchi et al., 2021).

The S-LCA technique (UNEP, 2020), while less consolidated than LCA at the impact assessment stage, offers a comprehensive set of social categories and indicators associated with six stakeholder categories⁶ to be used for the assessment of social impacts. This framework covers most of the risks included in the due diligence guidance (Table 23.2). Only specific aspects in the minerals supply chain (i.e. fraudulent misrepresentation of the origin of minerals, money laundering, and risk associated with the use of public or private security forces) are not included in the S-LCA framework.

The potential of the S-LCA technique for supporting the responsible sourcing of raw materials in Europe is investigated by Di Noi et al. (2020), who show that by using an S-LCA database it is possible to identify social hotspots in the raw materials supply chain. Using a similar approach, Blackstone et al. (2021) quantify the risk of forced labour in the fruit and vegetables supply chain in the United States. Even though the S-LCA databases have limited availability of sector-specific data and low data granularity, these macro-scale approaches allow performing a first screening of hotspots in the supply chain, showing the issues which deserve further investigation and supporting the prioritization of due diligence efforts (Di Noi et al., 2020).

The potential of the S-LCA technique to be applied for the purpose of human rights due diligence and also to highlight positive impacts associated with business activities is discussed by Benoît-Norris et al. (2018), while the UNEP guidance on S-LCA includes human rights due diligence of organizations among its uses (UNEP, 2020).

Table 23.2 Comparison between risk areas addressed by OECD due diligence guidance in the minerals, agriculture and garment and footwear supply chains and their coverage in the S-LCA and LCA techniques

	Sector-specific due diligence guidance (OECD)				S-LCA (40 social categories in total, UNEP, 2020)	LCA (16 impact categories in total, European Commission, 2021)
	MINERALS	AGRICULTURE	FOOTWEAR	GARMENT AND		
Child labour	x ¹	x	x		x	
Forced labour	x	x	x		x	
Human rights	x	x	x		x	
Bribery and corruption	x	x	x		x	
Labour rights		x			x	
Health and safety at work		x	x		x	
Wages		x	x		x	
Trade unions and collective bargaining		x	x		x	
Decent working conditions		x			x	
Discrimination and gender-based discrimination		x	x		x	
Local employment		x			x	
Training		x			x	
Food security and nutrition		x				
Tenure rights over and access to natural resources		x			x	
Animal welfare		x			x	
Responsible sourcing from homeworkers			x		x	
Sexual harassment and sexual and gender-based violence in the workplace			x		x	
Working time			x		x	
Direct or indirect support to non-state armed groups	x					
Fraudulent misrepresentation of the origin of minerals	x					
Public or private security forces	x					
Money laundering	x					
Payment of taxes, fees and royalties due to governments	x	x				
Technology and innovation		x			x	
Competition		x				
Hazardous chemicals			x			x
Water		x	x			x
Greenhouse gas emissions		x	x			x
Biodiversity		x				x
Sustainable use of natural resources		x				x

Note: ¹ Focus on worst forms of child labour.

Source: Authors' elaboration based on OECD (2013), OECD (2018b) and OECD/FAO (2016).

The environmental aspects included in the due diligence guidance (e.g. in the garment and footwear sector, which encompasses hazardous chemicals, water and greenhouse gas emissions) are all part of the LCA technique, which includes a broad range of impacts (e.g. 16 impact categories in the Product Environmental Footprint methodology recommended by the European Commission for the communication of the life cycle environmental performance of products and organizations, European Commission, 2021).

Mazijn and Revéret (2015) discuss the role of LCSA in life cycle management and in exercising due diligence. They observe that corporate social responsibility (CSR) requires companies to consider upstream and downstream activities. LCSA, considering the three dimensions of sustainable development and using a toolbox of different techniques, can provide the companies with an analysis and evaluation of impacts along the value chain. Collaboration between the worlds of RS and LCSA is however needed to facilitate the uptake of these techniques at business level.

Concerning the methodological approaches used in LCSA and in the due diligence process, both approaches consider the potential consequences of economic activities taking into account all the steps of the supply chain. However, some differences exist between due diligence and the methodologies included in LCSA. Among them are the following:

- *Scope/Perspective*: due diligence (as referenced by the OECD) is applied by companies and primarily consists of the traceability and scrutiny of suppliers in the upstream supply chain elements from one point or company in the supply chain. It is aimed at identifying and prioritizing risks and associated negative impact without the ambition of a comprehensive representation of the supply chain, a product or material flows. Instead, the LCSA entails the consideration of all the phases in the life cycle of a product or service (independent of its starting point). It also includes the consideration of the use phase (impacts occurring during the consumption of products and services) and the end-of-life phase, which involves the disposal of goods, the various options of waste management (recycling, landfilling, incineration) and the eventual recovery of materials and production of secondary materials. The use of recycled raw materials is taken into account in the due diligence guidance for minerals supply chains, while it is usually less important in the other sectors. However, a different interpretation by UNGP incorporates the entire value chain by referring to the process of due diligence as preventing or mitigating ‘adverse human rights impacts that are directly linked to their operations, products and services by their business relationships’ (UN, 2011, p. 14), which is closer to the Life Cycle Thinking approach.
- *Methodology for risk/impact assessment*: The due diligence approach is based on the establishment of a management system aiming at identifying risks, as quantification is not always possible/desirable. Typically, a ‘red-flag’ approach is used to highlight locations, suppliers or circumstances where risks are most likely to occur. However, quantitative indicators can be applied to monitor progress. The impact assessment phase in LCA is only quantitative and based on the use of impact assessment models and characterization factors, which express how much a single unit of elementary flows (e.g. the consumption in weight of a certain resource) contributes to an impact category. In S-LCA, two possible approaches can be used: 1) the reference scale approach, which focuses on the social performance or social risk of a product system and uses reference scales to define the levels of social risk/performance; 2) the impact pathway approach, which aims at predicting the consequences of the product system using causal or correlation/regression based models.

The reference scale method, based on the definition of risk/performance levels and using both qualitative and quantitative data, is closer to the due diligence approach, even though this type of assessment can also use generic (country/sector-specific) data provided by dedicated databases. This is less common/desirable in due diligence, which requires a higher level of detail. Indeed, due diligence implies the verification, monitoring and auditing of suppliers and commercial partners, gathering evidence and information on irresponsible sourcing practices.

- *Communication of results*: The corporate due diligence process requires the establishment of mitigation measures and reporting of due diligence results. The aim is to ensure that the production process is ‘responsible’ or ‘ethical’, that is, that products or services are produced or provided without severe abuses of human rights or drastic damages to the environment, and so on. Instead, S-LCA results can communicate both the negative and positive impacts of production and consumption systems. Positive socio-economic impacts can pertain, for instance, to the creation of employment and business opportunities, the improvement of quality of life and health (e.g. in the case of medical devices), the provision of facilities and infrastructures by companies operating in a territory, and so on. In particular, the S-LCA technique considers three different types of positive impacts: 1) positive social performance of a company going beyond business as usual, for example providing services to the community where it operates; 2) positive social impact through the presence of an economic activity (e.g. the local employment created in a region); and 3) positive social impact through product utility, for instance when considering the social value of products that improve human health (e.g. medicines) or the environment (e.g. water depuration plants) (UNEP, 2020). In S-LCA it is also possible to assess the ‘social handprint’, that is, ‘the impact of the changes being made by value chain actors (companies, suppliers) to improve their social impacts (reducing their social footprint and growing their social handprint)’ (ibidem, p. 31).

CONCLUSIONS

In conclusion, responsible sourcing (RS) and LCSA have many points in common, and both aim at promoting more sustainable production and consumption systems. In particular, corporate due diligence procedures with respect to RS have many links with the S-LCA technique, even though the latter has a broader scope and seeks to also identify opportunities arising from production and consumption systems. RS, in particular due diligence, combines regulatory efforts and corporate management systems for the purpose of mitigating sustainability risks in the supply chain. As recent examples have shown, LCSA approaches have great potential to provide required data for the very same purpose (Mazijn and Revéret, 2015), but due to their quantitative and sometimes macro-scale nature their results need to be translated into actionable information for concrete corporate decision-making. In addition, LCSA typically provides more comprehensive information (i.e. all phases of the supply chain, negative and positive impacts, etc.) compared to more risk-based RS approaches, but equally requires more data input. It will be particularly interesting to observe how in the near future the growing digitalization of supply chain and material flow data (e.g. digital product and material passports) will loosen the boundaries and bring the two approaches closer together for a more inclusive,

comprehensive and yet cost-effective methodology that improves sustainability performance at company and sector level.

NOTES

1. For example, UN *Guiding Principles on Business and Human Rights*, OECD *Due Diligence Guidance*, ICC *Guide to Responsible Sourcing*.
2. <https://re-sourcing.eu/>.
3. For example, Fairmined, Better Cotton Initiative, Forest Stewardship Council.
4. For example, World Gold Council, Global Organic Textile Standard, Aluminium Stewardship Council.
5. Referring to ILO Convention no. 182, which includes forms of hazardous and detrimental work, conditions similar to slavery, and so on (OECD, 2017).
6. Workers, local communities, society, consumers, other actors in the value chain, children.

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