Partial Organization and Social LCA Development: The Creation and Expansion of an Epistemic Community

Catherine Benoît Norris and Jean-Pierre Revéret

Abstract Life Cycle Assessment (LCA) is a technique to study the environmental impacts of products from cradle-to-grave that was developed at the end of the 1960s and standardized by the International Standards Organization (ISO) at the end of the millennium. The discussion and research efforts to broaden the scope of the technique to include social impacts (e.g., O'Brien et al. Int J Life Cycle Assess 1 (4):231–237, 1996, and Gauthier J Bus Ethics 59:199–206, 2005) accelerated with the creation of a project group in 2004 under the umbrella of the Life Cycle Initiative, a joint enterprise of the United Nations Environment Programme and the Society for Ecotoxicology and Environmental Chemistry. Numerous authors have highlighted the institutionalization process of LCA and the social shaping of the technique (e.g., Heiskanen Sci Stud 11(1):27–51, 1997, Heiskanen J Clean Prod 10 (5):427–437, 2002; Frankl INSEAD Working Paper, Fontainebleau, France, 2001; Baumann et al. Towards Life Cycle Sustainability Management, 73–83, 2011). However, none of this research applies stakeholder theory, considers these forums as epistemic communities, nor strives to explain the organizational processes and dynamics of the field's development. A new theoretical framework (Rasche et al. J Bus Ethics 115:651–663, 2013) based on advancements in the sphere of organization studies (Arhne et al. Organization 18(1):83–104, 2011) offers a new perspective regarding the elements that enable and constrain organized orders. Rasche et al. (J Bus Ethics 115:651–663, 2013) argue that it is useful to analytically distinguish different modes of organizing for Corporate Social Responsibility (CSR) along the dimensions of complete-partial organization. They call for research to further examine the role of actors in the processes of organizing for CSR that would also highlight the dynamics of CSR multi-stakeholder initiatives. The phenomenon of Social Life Cycle Assessment development offers the context for a rich

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case study that can draw upon and contribute to these new research avenues. Researching the organization of the development of this new phenomena contributing to CSR will also help to further reveal the process of social construction of scientifically based methods. An analytical framework proposed by Glasbergen (Environ Policy Governance 21(1):1–13, 2011) serves as a starting point to map the process of the partnership and method development. This framework is then refined with reflections regarding epistemic communities.

Keywords Stakeholder theory · Corporate social responsibility · Multi-stakeholder initiative · Social shaping · SLCA institutionalization · Epistemic communities · Social Hotspot Database (SHDB)

1 Introduction

1.1 Social Life Cycle Assessment as a Tool for CSR

Social Life Cycle Assessment (SLCA) is a phenomenon that appeared in the late 1990s and is now at its rising crest as attested to by the growing number of published journal articles (Jorgensen 2013). Building on the technique of environmental Life Cycle Assessment (LCA), it aims to identify the positive and negative social impacts attributable to a product life cycle from the extraction of raw materials to the elimination of its waste, including the product use phase. It makes use primarily of industrial ecology modelling and accounting frameworks, and Corporate Social Responsibility (CSR) issues mapping, framework, and indicators. There is an ample and diverse literature that discusses the development, application and challenges of environmental LCA in several well-established journals such as the *Journal of Cleaner Production*, the *Journal of Industrial Ecology*, the *International Journal of Life Cycle Assessment, Environmental Science and Technology*, and others.

Being essentially a new impact dimension added to *environmental* life cycle assessment, SLCA development has been occurring mostly within the vicinity of the LCA organizations and initiatives, and those developments are mostly published in the same journals as environmental LCA issues.

Both Social and Environmental LCA can be considered as tools for CSR because they apply a framework to assess sustainable development dimensions within the sphere of a company's product's life cycles. CSR has been defined as the appropriation and implementation of the logics and principles of sustainable development to the business domain (Capron and Quairel-Lanoizelée 2004; Yedder and Farhoud 2009).

The first section of this chapter contextualizes the development of SLCA within CSR multi-stakeholder initiatives, and presents its history, highlighting the role played by the Life Cycle Initiative Project Group. In this chapter, we study the organization and the dynamics of SLCA initiatives using the SLCA project group and the SHDB as examples. In order to explore the organization of these activities, we first need to

understand what differentiates LCA from other sustainability decision-making tools. Thus, the second section explores the relevant literature regarding LCA's social construction and institutionalization. The third section analyzes how the Life Cycle Initiative SLCA project group was organized, applying the partial organization theory, and who was involved, using the stakeholder theory. The third section also introduces the concept of epistemic communities to understand better how the SLCA methodology was created, is evolving, and how the community it reaches is expanding. The fourth section highlights the dynamics of multi-stakeholder initiatives and demonstrates how SLCA activities evolved over time. The fifth section testifies to the growth of the SLCA epistemic community, using the development of the SHDB as an example. The sixth section discusses the importance of considering how initiatives are organized and evolve over time, so that they can better reach their objectives.

1.2 Methodology

The authors of this chapter have had hands-on experience regarding the development of SLCA. In particular, Catherine Benoît Norris coordinated the development and is lead editor of the SLCA Guidelines publication (Benoît and Mazjin 2009). She is also the executive director of the SHDB project that she co-created, piloted and launched at New Earth (Benoît Norris et al. 2012). Therefore, Catherine has a privileged (and of course subjective) viewpoint of SLCA development, having played a pivotal role at a special moment in its history. Participant observation was used during the process of development of SLCA (within the Life Cycle Initiative Project Group), and action research was conducted during the creation of the SHDB. Participant observation is a widely used method aiming to gain a close and intimate familiarity with a given group of individuals and their practices through an intensive involvement with people in their cultural environment, usually over an extended period of time (Kawulich 2005). Action research is research initiated to solve an immediate problem or a reflective process of progressive problem solving led by individuals working with others as part of a "community of practice" to improve the way they address issues and solve problems (Winter and Munn-Giddings 2001).

This article utilizes organizational theories and analytical tools to shed new light on the recent developments in the field of SLCA, their effect, and how they came into being.

1.3 The Life Cycle Initiative as a CSR Multi-stakeholder Initiative

The term CSR multi-stakeholder initiatives, also referred to as "partnerships", bears multiple designations in the literature, having more or less the same meaning. For instance, a multi-sectoral initiative will refer to an initiative including all four spheres

of society (state, market, NGO, and civil society), while the term "cross-sectoral initiative" will refer to an initiative including at least two spheres, and the term "intersectoral initiative" will also refer to an initiative that includes at least two societal spheres. "Intersectoral" partnerships can be defined as "collaborative arrangements in which actors from two or more spheres of society (state, market, NGO, and civil society) are involved in a non-hierarchical process, and through which these actors strive for a sustainability goal" (Van Huijstee et al. 2007).

CSR multi-stakeholder initiatives represent a contemporary way to organize in order to achieve a common practical purpose, pool core competencies, and share risks, responsibilities, resources, costs and benefits (Utting and Zammit 2009). Traditionally, the responsibility for dealing with sustainability issues was attributed to governmental organizations (Van Huijstee et al. 2007). However, since the beginning of the new millennium, public–private partnerships have become widely adopted and are generally understood with "reference to changing modes of governance, adaptations in management practices within both public and private institutions, as well as in perceptions regarding the roles and responsibilities of different development actors in the context of globalization and liberalization" (Utting and Zammit 2009). They are often portrayed in the literature as part and parcel of a "pragmatic turn" regarding governance and policy making. Intersectoral partnerships open up the policy arena to actors from spheres of society other than government (Dubbink 2003; Arts and Leroy 2006). The relationship between intersectoral partnerships and sustainable development was formalized when it was declared that partnerships are an important instrument for implementing sustainable development at the 2002 World Summit on Sustainable Development in Johannesburg (Hens and Nath 2003; Norris 2005; Eweje 2007; Van Huijstee et al. 2007).

CSR multi-stakeholder initiatives can be grouped using different typologies. Variables used to construct the typology often differ in the literature; they may be categorized by the degree of engagement between the partners (Austin 2000), by their goal (Glasbergen and Groenenberg 2001), by the functions they claim to fulfill (Hartman and Stafford 1997), or according to the participating actors (Davis 1999). Typologies may use one variable, as in the examples above, or they may employ several at once (e.g., Caplan 2003; Murphy and Bendell 1997; or Gray and Stites 2013).

The latter (Gray and Stites) uses two variables, level of shared responsibility and scope of the initiative, to categorize intersectoral partnerships. We adopt this approach to contextualize the Life Cycle Initiative.

The Life Cycle Initiative, an International Life Cycle Partnership, was launched in 2002 under the umbrella of the United Nations Environment Programme and Society for Ecotoxicology and Environmental Chemistry (SETAC), in order "to enable users around the world to put life cycle thinking into effective practice".[1] In particular, the Initiative aims at strengthening the methodology of LCA by facilitating the exchange of knowledge among more than 2,000 experts worldwide, and building its acceptability and legitimacy as well as promoting life cycle thinking globally.

[1] www.lifecycleinitiative.org.

The Initiative responds to the call by governments around the world for a Life Cycle economy in the Malmö Declaration (2000). It contributes to the 10 year Framework of Programmes to promote sustainable consumption and production patterns, as requested at the World Summit on Sustainable Development (WSSD) in Johannesburg (2002).

The Life Cycle Initiative plays a major role in facilitating a methodological consensus among members and defining optimal application scenarios of the method (life cycle management) with users and practitioners, many of whom work for, in collaboration with, or in businesses. These users and practitioners include sustainability managers, designers, engineers, consultants, interns, professors, and research associates working for industrial research groups, graduate students, etc.

Figure 1 presents the different types of CSR multi-stakeholder initiatives and sustainable development partnerships. The original figure found in Gray and Stites (2013) was designed to characterize business and NGO partnerships. It was adapted to study CSR multi-stakeholder initiatives, thus eliminating the need to include the categories of partnership reflecting only dyadic relationships, while also making the necessity to add new categories relevant to this specific type of intersectoral partnership: Scientific/Methodology Development, and Capacity Development and Dissemination.

The Life Cycle Initiative, like most CSR multi-stakeholder initiatives, has a broad mission to make its activities fit into the three main categories of the Gray and Stites framework: scientific and methodology development, capacity development

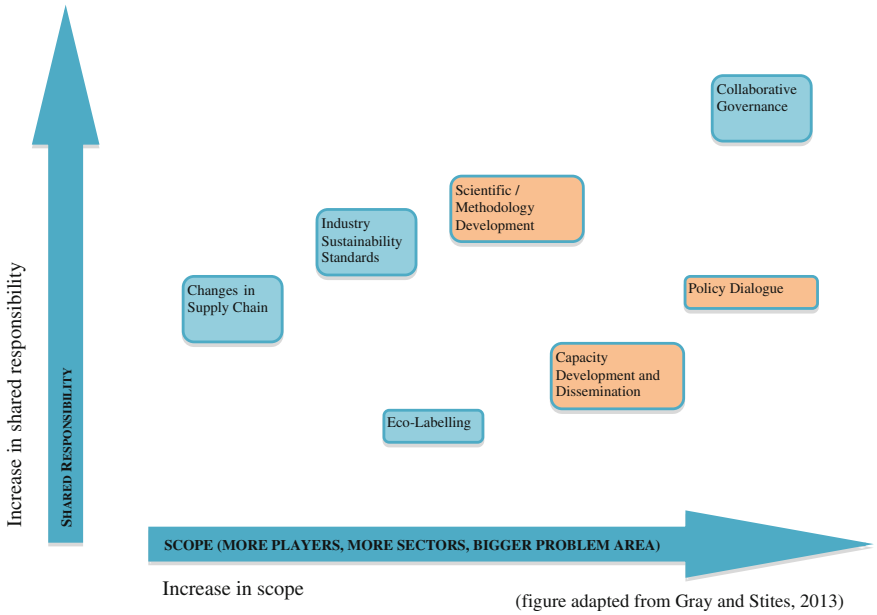

Fig. 1 Types of CSR multi-stakeholder initiatives or SD partnerships

and dissemination, and policy dialogue. All three categories rank at the higher range of shared responsibility and scope. However, the Life Cycle Initiative does not go as far as being collaborative governance. The table below presents some of the main existing Social Responsibility multi-stakeholder initiatives and identifies the leading sector as well as the partnership categories to which their activities mainly belong. This serves to put the activities of the UNEP/SETAC Life Cycle Initiative in context. In order to identify the categories of partnership for each initiative, the "about" section of each initiative Web site was scrutinized. From Table 1, we can observe, for instance, that UN-led partnerships tend to include policy dialogue in their activities, and industry-lead partnerships have a focus on developing sustainability standards.

Table 1 Multi-stakeholder initiatives leading sector and partnership categories

Name of Initiative	Launch year	Leading sector	Categories
UNEP SETAC Life Cycle Initiative	2002	UN/ Scientific lead	Scientific/methodology development, capacity building and dissemination, policy dialogue
UN Finance Initiative	1992	UN lead	Industry sustainability standards, scientific/ methodology development, capacity building and dissemination, policy dialogue
WBCSD	1995	Industry lead	Industry sustainability standards, scientific/ methodology development
Global Reporting Initiative	1998	UN lead, NGO lead	Industry sustainability standards, scientific/ methodology development
Global e-Sustainability Initiative	2001	UN lead	Industry sustainability standards, scientific/ methodology development, capacity building and dissemination
Global Compact	2004	UN lead	Industry sustainability standards, capacity building and dissemination, policy dialogue
Electronic Industry Code of Conduct	2004	Industry lead	Industry sustainability standards, capacity building and dissemination
ISO 26000	2005	Standard lead	Industry sustainability standards, scientific/ methodology development
Global Social Compliance Programme (GSCP)	2006	Industry lead	Industry sustainability standards, scientific/ methodology development, capacity building and dissemination
ILO IFC Better work global program	2007	UN – IFC lead	Changes in supply chain, capacity building and dissemination, policy dialogue
The Sustainability Consortium (TSC)	2009	Scientific/ industry lead	Industry sustainability standards, scientific/ methodology development
Global Initiative for Sustainability Rating	2011	NGO lead	Industry sustainability standards, scientific/ methodology development
Sustainability Purchasing Leadership Council	2013	NGO lead	Industry sustainability standards, scientific/ methodology development, capacity building and dissemination

The Life Cycle Initiative, as an actor, can be identified as a convener. The convener role (as described in Arenas et al. 2013) is to identify and bring the legitimate stakeholders to the table and adopt an "unbiased, even-handed approach to the problem domain" (Gray 1989). Among the main attributes of conveners, Wood and Gray (1991) identify being trusted and perceived as fair, credible, and powerful, being a "bridging organization" or an "enabling structure" (Selsky and Parker 2005), and playing a key role in facilitating collective action (Hardy 1994; Westely and Vredenburg 1991). To be a successful enabler, an organization must be able to link diverse constituencies (Westely and Vredenburg 1991), establish "common meanings and understanding across cultural boundaries" (Crane 2000), and display persistence and entrepreneurial capacity to cope with threats and maintain its support (Stafford et al. 2000; Arenas et al. 2013).

1.4 The Life Cycle Initiative Social LCA Project Group

In 2004, the UNEP/SETAC Life Cycle Initiative recognized the need for a task force to integrate social criteria into LCA. As a convener, the Initiative sought participation among interested members and other organizations. The task force was created with the objectives of (1) to convert the current environmental tool LCA into a triple-bottom-line sustainable development tool; (2) to establish a framework for the inclusion of socioeconomic benefits into LCA; (3) to determine the implications for life cycle inventory analysis; (4) to determine the implications for life cycle impact assessment; and (5) to provide an international forum for the sharing of experiences with the integration of social aspects into LCA (Benoît et al. 2010). Thus the planned activities of this task force (or project group) were to contribute to scientific/methodology development as well as capacity building and dissemination.

The first meeting of the SLCA Project Group was held in Prague, back to back with the annual SETAC Europe conference in April 2004. At this meeting, and at each meeting thereafter, methodological issues (including indicators) and case studies were discussed. The first deliverable was the publication of a feasibility study in May 2006 (Griesshammer et al. 2006), which concluded, "In terms of methodology, there are evidently no fundamental problems calling the feasibility of SLCA into question". After that, 12 meetings, workshops and seminars were organized between April 2004 and April 2009. Over 70 professionals became members of the project group during its lifespan, of whom 22 actively participated in the development of the Guidelines. Twelve organizations[2] representing key

[2] Accountability International (AI), Consumers International (CI), Fair Labor Association (FLA), Fair Trade Advocacy Office (FTAO), International Consumer Research & Testing Ltd (ICRT), International Labor Office (ILO), International Organization of Employers (IOE), International Social and Environmental Accreditation and Labelling Alliance (ISEAL), International Trade Union Confederation (ITUC), Society of Environmental Toxicology and Chemistry (SETAC),

stakeholders in the field of social responsibility provided continuous feedback on the SLCA guidelines and the project group work, and an international peer review was organized by UNEP and SETAC. Following the peer review, the publication of the Guidelines for SLCA of products (Benoît and Mazijn 2009) was officially launched on May 18, 2009 in Quebec, Canada, in conjunction with the ISO 26000 meeting (Benoît et al. 2010).

One element that differentiates the Life Cycle Initiative relative to other CSR multi-stakeholder initiatives, is that in fact, the stakeholders are gathered around a tool. Even though tool development is an important element of other intersectoral partnerships, what distinguishes the Life Cycle Initiative is that the tool (LCA) is the central motivation and rallying point for the efforts and activities.

With the publication of the SLCA Guidelines, a new era had begun, marked by expansion and acceleration. This post-Guidelines period sees the field opening up to new stakeholders and myriad new developments published in dedicated journal sections and books. The activities taking place within the field of SLCA post-guidelines are of a different nature and include case studies, further methodological development, the application of different theories to the SLCA framework and case studies, professional studies, and also the development of a database for SLCA, the SHDB.

The UNEP Life Cycle Initiative board, after the publication of the SLCA Guidelines, offered support to the SLCA methodological sheets completion project but did not extend this support to convene groups around new developments in the field of SLCA. However, a publication on Life Cycle Sustainability Assessment was written and published under the umbrella of the Initiative in 2011. Reasons for not including SLCA project group(s) in the formal program of the Initiative in its Phase 3 have not formally been given; perhaps a lack of funding, a lack of support from the Society of Environmental Toxicology and Chemistry regarding development involving "soft science", and/or perhaps a choice in the establishment of strategic priorities by the board for the Initiative contributed to the non-renewal of the project group.

New Earth, a not-for-profit organization based in the U.S., developed the SHDB in 2009, and Wal-Mart Private Brands funded the initial development of the SHDB. The Sustainability Consortium and additional private companies subsequently funded the piloting of further developments and projects and applying the SHDB. New Earth launched an advisory board for the SHDB project in 2009 that was composed of distinguished individuals from the industry, government, NGOs and academia. In 2013 the SHDB became the first comprehensive social impact database to be made available in LCA software tools.

(Footnote 2 continued)
United Nations Environment Programme (UNEP), US International Bureau of Labor Affairs (ILAB), World Business Council for Sustainable Development (WBCSD).

2 Social Shaping and Institutionalization of LCA

An interest in the social construction of the LCA technique and its institutionalization process resulted in the publication of several papers beginning in the mid-1990s (e.g., Heiskanen 1997, 1999, 2002; Ehrenfeld 1997; Frankl 2001; Baumann et al. 2011).

Although it is undisputed that the LCA methodology was socially shaped in addition to being scientifically constructed, Heiskanen (1997) was the first to establish this point in the literature, making use of the Latour Actor-Network Theory. Heiskanen's findings (1997) depict the existing tensions between proving the scientific validity and internal coherence of the method on the one hand, and on the other making it relevant to a variety of stakeholders intending to apply it in different settings with different objectives in mind by studying the phenomenon of LCA as a scientific method and as a management tool. This categorization is useful in the context of this article and will be utilized to refer to ideas and theory from the literature.

2.1 LCA as a Scientific Method and a Management Tool

Common definitions of LCA emphasize its scientific aspect, and LCA is usually referred to as a scientific tool. However, the origin of LCA lies in chemical engineering and materials accounting. As a technique, LCA makes use of science without being a scientific domain in itself.

In the 1990s, mounting criticism towards the young and unstandardized LCA method motivated the SETAC to get involved and hold several workshops in order to resolve problems associated with the methodology (Heiskanen 1997; Guinée et al. 2011). SETAC, one of the organizations that later founded the Life Cycle Initiative, as we mentioned earlier, sought to bring more credibility to the method and to develop a systematic, transparent and reproducible methodology, mainly through the series of workshops that it organized. This laid the groundwork for stakeholder involvement in methodology development and created the first sparks leading to the creation of the Life Cycle Initiative.

Guinée et al. (2011) describes the historical process of LCA development at length, but without analyzing it with a specific framework. Heiskanen (1997) shows that there is an inherent "politics dimension" within LCA, that politics is embedded in the method itself (Heiskanen 1997). Although she argues that additional stakeholders should have been and should be part of method development, she does not analyze the process of development per se and provides a limited account of how and which stakeholders contributed to method development (Heiskanen 1997).

Heiskanen also notes that over time, LCA results are becoming increasingly complex, which explains the specialization and "scientification" of the method. She also stresses that scientifying LCA, while legitimizing its practice, does so by emptying the technique of local meaning and context, thus making it less useful for decision-making. She believes that local stakeholders have largely been ignored in

the development, one example being the creation and application of universal valuation methods.

Applying concepts from the perspective of the social studies of science and technology (SST), Heiskanen defines LCA as a "boundary object" (Heiskanen 1999); this is a concept referring to knowledge constructs that interface between scientific and other social worlds (Star and Griesemer 1989), and which provide these diverse worlds with a unifying concept while allowing the different constituencies to maintain their local interpretations.

She concludes that the ambiguity and the multidimensionality of LCA need not always be seen as a weakness of the method, but also sometimes as a strength. Beyond its ambiguities, which can accommodate a number of diverse interpretations, considering LCA as a "boundary object" sheds light on its ability to bring together the viewpoints of industry, authorities, scientists and environmentalists.

The conceptual application of LCA involves policy stakeholders at different stages of the knowledge creation and utilization process, thus possibly leading to converging problem definition. In Heiskanen's view—and those of other authors—this convergent problem definition is not a starting point of the LCA, but its end result.

Heiskanen also argues that the original problem for which LCA was developed, and eventually the scientific community involved, of finding robust and incontestable solutions to environmental problems, remains unsolved (1997). She gives several explanations for this, primarily related to the situation that constructs do not exist as such in the real world. Since LCA's models are *constructs,*[3] they can't serve to find incontestable solutions. Although the fact that LCAs are constructs is often referred to in the literature (including in the SLCA Guidelines), it largely remains a blind spot for LCA. Another explanation provided by Heiskanen concerns how we view and attribute responsibility for social problems. She links the issue of context, and conceptual conflict in LCA utilization, to the broader debate on science and environmental policy, using concepts developed by Latour (1987, 1988, 1993) and exploring the idea that science cannot solve environmental problems precisely because it is different from decision-makers everyday knowledge. As such, she is one early voice calling for more stakeholder involvement in LCAs. Hers is a voice still finding echoes 15 years later (Baumann et al. 2011; Macombe 2013).

According to Heiskanen (1997), standardization moved LCA out of the domain of scientific methods and into the world of sustainability management tools.

2.1.1 LCA as a Management Tool

LCA is a management tool because it aims to provide insights to decision-makers concerning the sustainability impacts of product life cycles. It is thus offered and often expected to be used by firms and governments in developing strategies and

[3] Constructs are ideas or theories containing various conceptual elements, typically ones considered to be subjective and not based on empirical evidence.

policies aiming at improving, over time, the environmental burden associated with the production of goods and services. LCA is considered by many to be a complementary and more comprehensive tool with respect to other environmental management systems (EMS) for supporting an effective integration of environmental (and now social) aspects in business and economy (Frankl 2001). LCA can be used in many different ways by companies: for internal purposes, such as hotspotting; comparing existing products with planned alternatives; research; design and development; long-term strategic decisions; and for external uses, such as in marketing claims, communicating LCA results to clients, suppliers, consumers and other stakeholders.

From all these possible applications, research shows that LCA is used more often as an educational exercise than for comparing products (Heiskanen 2001; Frankl 2001 and many others). LCA provides managers with a new perspective on their products. This tends to support Ehrenfeld's (1997) idea that LCA's value stems primarily from its worldview, despite all its attention to detail.

One of Heiskanen's main points (1997, 1999), alluded to in the previous section, is that LCA takes local information to produce global knowledge. She points out that this is a very relevant and useful exercise because in our global economy, responsibility for sustainability issues can be so diffused that environmental and social systems may be destroyed without anyone being responsible for it. Therefore, LCA can be seen as an antidote for this, showing the unintended consequences of actions taken by life cycle actors. However, as she puts it, "the translation back from the universal to the local is as large of a problem as the translation from the local to the universal" (1999), and that is a problem largely unaddressed in LCA as yet (Baumann et al. 2011).

Beginning in the 1990s, researchers have been calling for the incorporation of additional stakeholder perspectives in the development and roll-out of the technique (e.g., consumers and value chain actors) (Heiskanen 1997, 2001; Baumann 2004; Baumann et al. 2011).

It is well known that conducting an LCA may require the involvement of a large number of different constituencies. For instance, it may require the input of scientists from many fields (engineering, environmental chemistry, toxicology, biology, social sciences), and involvement of many business units (communications/marketing, sustainability, ethical compliance) and different kinds of policy stakeholders. It concerns myriad economic activities (from raw materials extraction to waste management) and it encroaches on a large number of different stakeholders and interests. Heiskanen stresses that in order to gain a solid foothold for the LCA conceptualization, this heterogeneous network of actors and activities must be held together. "It is not enough to create a research model spanning this extensive network of activities; the model must also be believed in and enacted by the actors that it concerns" (Latour 1988).

How concepts and ideas are becoming integrated into the ordinary lives of people and organizations is often approached in the literature through institutionalization theory. The institutionalization of LCA and the institutionalization process are topics studied in the literature. Institutionalization refers not only to formal

regulations and institutions, but also the establishment of ideas, in terms of what the world is like, and which behaviors appear appropriate for different actors in society (see Berger and Luckmann 1967; DiMaggio and Powell 1983; Scott 1995). Institutionalization also occurs through action patterns in which people reproduce the rules and routines that bring structure to everyday life (Scott 1995; Barley and Tolbert 1997).

The institutionalization of LCA occurs at the level of the company (Frankl 2000), but also at a more diffuse level—societal (Heiskanen 2001)—to a point where everyday social actors are aware of product supply chains and life cycles to some extent. One example of this is the book *Ecological Intelligence* (2009), written by Dan Goleman, a New York Times best-selling author, which presents and discusses LCA for the general public. LCA was also presented to the Dalai Lama himself in Dharamsala, India, in 2011, at a workshop organized for him by the Mind and Life Institute and broadcasted on the Web.[4]

We can safely argue that LCA has achieved a high level of global institutionalization. Most fortune 500 companies have implemented LCA in some form over the past 20 years, and companies in developing economies are following the trend (Finnish Environment Institute 2010). Governments have enacted laws or implemented strategies citing life cycle thinking. CSR multi-stakeholder initiatives have been using LCA as a core component of their program.

Frankl and Rubik (2000) have studied LCA institutionalization processes, which they divide into three steps: pre-institutionalization, semi-institutionalization, and full institutionalization in 20 European companies. These three steps describe how integrated LCA is in the activities and strategic planning of companies. It shows that there is a dynamic in the way that companies take ownership of the tool.

3 Organizing for Social LCA Development

Although the literature acknowledges the social shaping of LCA, it does not offer any insights on how stakeholders organize in order to develop a sustainability methodology and how this organization evolves over time.

From the LCA literature, we've learned that LCA is a method that uses a large variety of science findings and tools, and that it aims to provide information to policy makers as well as to everyday economic actors, primarily managers. We also know that LCA is highly institutionalized, that it engages many constituencies, and despite the existence of the Life Cycle Initiative, should involve more stakeholders in methodology development and when conducting studies. The complexity of LCA is also an aspect discussed in journal articles as well as the intrinsic internal policy of development.

[4] http://www.mindandlife.org/dialogues/past-conferences/ml23/.

According to Heiskanen (1997, 2001), ordinary market actors all along have been conceptually incorporating more qualitative factors in a Life Cycle Thinking framework, including worker's conditions, health and safety, or biodiversity.

As we have seen, SLCA is a technique closely related—but also distinct from LCA and its development—that occurred mostly in the past decade, and has a specific history. In the remainder of this chapter we will explore how the process of development of SLCA took place, as well as what the dynamic has been. In order to study this process, we need to discuss how groups may organize and how they are formed.

3.1 Who Has Been Involved in Social LCA Development?

One theory is clearly associated with CSR, and and that is the Stakeholder Theory (Freeman 1984; Freeman 2004). What this theory tells us is that stakeholders have legitimate interests in corporate, and more broadly, organization's activities. Stakeholder theory can be normative or descriptive. The former is usually considered to represent the core of stakeholder theory, and it can refer to the ideal social context, to social norms as they currently exist, or to what needs to be done to create a desirable society (Friedman and Miles 2006). It can go as far as stating that "a corporation ought to be managed for the benefit of its stakeholders: its customers, suppliers, owners, employees, and local communities, and to maintain the survival of the firm (Evan and Freeman 1988; Melé 2008)".

In our case, descriptive stakeholder theory offers the most relevant insights because we are interested in applying its analytical framework in order to identify and characterize the stakeholders involved in SLCA development.

In line with Donaldson and Preston (1995) and Cronin et al. (2011), categories of stakeholders include governments, international organizations, NGOs, business entities (competitors, investors, supply chain partners, and industry groups), consumers, and community representatives. In addition, knowledge institutions (such as universities, research centers and think tanks) are added as a stakeholder group, given their active roles in many multi-stakeholder initiatives (Dentoni and Peterson 2011). Consultants may also play a significant role and be quite active in CSR multi-stakeholder initiatives and are also added as a separate category.

While the six groups of stakeholders portrayed in Fig. 2 participated at some level in the Life Cycle Initiative SLCA project group within the seven main years of its existence (2004–2010), if we consider the affiliation of the authors of the SLCA guidelines, we find the vast majority of contributors to be in the "researchers" category, and the rest to be from the "consultants," "businesses", and "inter-governmental organizations" (IOG) representative categories. The reviewers and the organizations consulted regarding the Guidelines were covering the other groups, with NGOs and research organizations being the most represented.

The objectives of the Project Group were to contribute to scientific/methodology development as well as capacity building and dissemination via the development of

Fig. 2 Stakeholders involved in the LCI SLCA project group

a framework to include socioeconomic impact on LCA and the sharing of experiences. Hence, it is not surprising to have many researchers and research organizations involved.

In that regard, the SLCA project group resembles what has been identified in the literature as an epistemic community; these are collective groups of people that share expertise in a given domain and are concerned with the production and dissemination of knowledge, and the relation of these activities with policy (Meyer and Molyneux-Hodgson 2011). These communities are said to be a crucial force for the production, discussion and diffusion of scientific knowledge.

Emmanuel Adler and Peter Haas introduced the term "epistemic community" in the literature on policy and international relations (Adler 1992; Adler and Haas 1992; Haas 1989, 1992). Several of their articles that were published in *International Organization* are now considered founding texts in this field. Since then, and particularly since the end of the 1990s, the notion of epistemic community has been applied to numerous academic domains, including political science, international relations, economics, law, business studies, administration, sociology, etc.

According to Meyer and Molyneux-Hodgson, one of the useful characteristics of the notion of epistemic community is that it accentuates the collective nature of knowledge production. This notion is also useful to point out the positioning of these collectives in relation to policy making. According to Haas and Adler (1992), epistemic communities are as preoccupied with knowledge production as they are with influencing policy. Indeed, epistemic communities are born from a policy demand, and policy receptivity is crucial for these communities. The knowledge

that they produce is supposed to provide solutions to specific problems. They thus have to produce "applicable knowledge".

Epistemic communities are usually comprised of scientists or of people sharing a similar scientific background. The SLCA project group, as we have seen, is very much a multi-stakeholder environment. Sometimes the concept of trans-epistemic communities (Knorr-Cetina 1982) has been used in the literature to describe this situation, but for our discussion and in line with a more holistic understanding of the concept, we will consider epistemic communities as communities of experts without regard to the various affiliations of these experts (consulting, businesses or others).

Haas refers to John Ruggie's conceptualization regarding the power of broader visions of reality, or epistemes, that provide the assumptions from which policies follow and shape the pattern of politics (and policies, too) over the long run (Haas 1992). Haas argues that institutionalization involves not only the institutional grid of the state and the international political order, through which behavior is acted out, but also the epistemes through which political relationships are visualized.

The SLCA project group was launched with its Terms of Reference described above and included experts from around the world with an interest and growing experience in the matter of studying social impacts with a LCA perspective. It was mandated to develop consensually a "practical" framework, emerging from these experiences, for the incorporation of social impacts into LCA. This was needed in order to broaden the then environmentally-focused technique to other areas of sustainable development so that it could become a tool for sustainable development.

In epistemic communities, the knowledge creation mode is much like a form of externalization (conversion of tacit knowledge into explicit knowledge), in the sense of Nonaka and Takeuchi (1995). The first task of epistemic communities is thus to create a "codebook" so that the knowledge circulating within epistemic communities is made explicit.

By forming the SLCA project group, the Life Cycle Initiative planted the seed for the emergence of the new epistemic community that came to life with the writing of the Feasibility Study (2006), an internal codebook for the experts, and the development and publication of the SLCA Guidelines, which communicated this framework to the external world (2009).

In turn, the presence of this epistemic community, which created the SLCA guidelines and the methodological sheets and interacted with the Life Cycle Initiative board to achieve the acceptance of the framework and officially launch this new domain, has also bolstered the practice. The goal of epistemic communities is thus simultaneously outside and above the community's members. Figure 3 reveals the process of creation and expansion of the SLCA epistemic community.

Since the SLCA project group was more or less dismantled after the publication of the SLCA guidelines and the methodological sheets, the epistemic community became more diffuse, although we argue that this epistemic community is nevertheless growing and playing a strong role in laying the groundwork for a broader acceptance of SLCA and actively participating in the construction of the social reality, which includes SLCA (institutionalization).

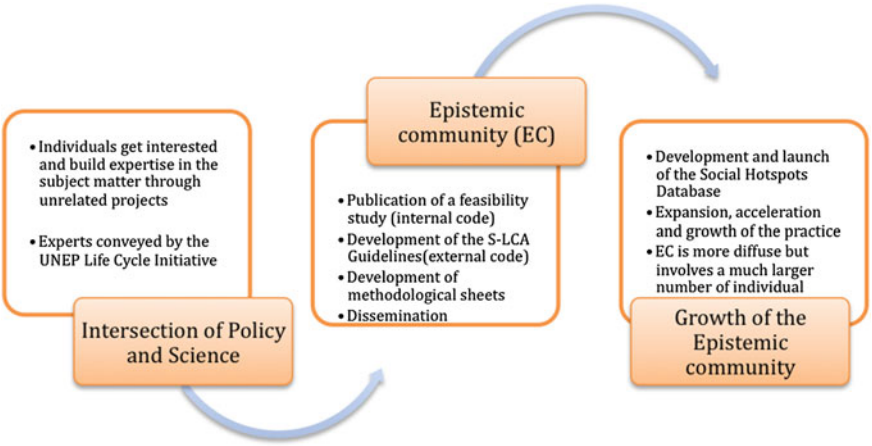

Fig. 3 The expansion of an epistemic community

3.2 Social LCA Project Group Organization

According to Ahrne and Brunsson (2011), it has been a mistake to analyze, almost solely through the lenses of institutionalization or networks, the activities that take place outside formal organizations (businesses), and they argue that organization theory can shed an informative light on how initiatives function. They define an organization as a decided order in which people use elements that are constitutive of formal organizations, which in turn open the door to studying how people organize outside of formal organizations (Ahrne and Brunsson 2011).

They present a set of criteria describing formal organizations and argue that informal organizations and initiatives can also be partially organized and studied as such through the use of one or more of these elements.

Membership, hierarchy, rules, monitoring and sanctions are all elements that are constitutive for the institution of organization as defined in laws or textbooks or otherwise widespread conceptions of formal organizations (Ahrne and Brunsson 2011). While all these elements are objects for decisions, the management of a formal organization cannot decide to abstain from an element altogether (Brunsson 2006).

However, these elements can also be used separately. As presented by Ahrne and Brunsson (2011), those who wish to organize do not always have the opportunity to or interest in building a complete, formal organization. Instead, they may use "merely one or a few of the organizational elements, thereby creating a partial organization among individuals or organizations. The organizers may be individuals or formal organizations, but they organize outside of any formal organization."

De Bakker et al. argue that the model of partial organizations presented by Ahrne and Brunsson (2011) reflects not only a desire to build more complete theories of organizations, but also a realization that the boundaries between different societal

domains and their corresponding organizational forms have become increasingly blurred (de Bakker et al. 2013).

In agreement with de Bakker, Rasche et al. (2013) argue that there is value in examining the organizational features of CSR developments more closely. After all, they say, "businesses address social and environmental issues through different types of organizing". As we have seen, one type of CSR organizing is multi-stakeholder partnerships such as the Life Cycle Initiative, whose SLCA project group has enacted some elements of formal organization. Each element will be discussed to highlight how they were managed during the active period of the project group.

Membership in the project group was open but the project group chair, upon reviewing interested candidate's qualifications, approved members. The project group also became closed to new members when the process of Guidelines development was reaching its end.

Although multi-stakeholder partnerships are usually considered to be nonhierarchical (van Huijstee et al. 2007), and the decisions made within the project group usually were made consensually, elements of hierarchy were present. Hierarchy implies "a right to oblige others to comply with central decisions" (Ahrne and Brunsson 2011). The group had a chair and two co-chairs who were initially the leaders and decision-makers for the group. As the work of the project group progressed, the decision-making process became increasingly open and leadership emerged from active group participants. While the hierarchy remained in place, in practice, additional individuals were granted leadership roles mainly based on their work contributions to the group.

There was no set of specific rules to follow, but the project group had terms of reference orienting their work. Although Rasche et al. (2013) find that rules are relevant in partnerships in several ways, such as internal rules, governing the partnership, and defining, for instance, membership, often there are also no clear guidelines available on how to operate within a partnership (Rasche et al. 2013).

Even if there is no formal monitoring process, they find that partners will often closely monitor the results of their fellow partners to see whether each participant is living up to the expectations. The Life Cycle Initiative Board was the organ responsible for monitoring the project group's advancements in regard to the set terms of reference, but there was no formal monitoring of individual's work. Rasche et al. (2013) highlight accountability when discussing monitoring, citing work from Bäckstrand (2006); they also list accountability, measurable targets, and timetables, reporting and monitoring mechanisms as important elements for successfully organizing partnerships. Even though the project group had no formal process for monitoring an individual's work, it was implementing all the above-mentioned mechanisms. In the project group, individuals were taking charge of tasks (accountability), and pledging to provide results by the agreed-upon deadline where they reported on progress.

Regarding the last element—sanctioning—there was no defined process in the Life Cycle Initiative SLCA project group. Rasche et al. (2013) also found that the "flexible character of monitoring complicates the final element of organization—sanctioning—as the outcomes of monitoring usually form the reason to sanction".

They add that, "the way partnerships are constructed often includes only limited sanctioning power for its participants". This was the case for the Life Cycle Initiative SLCA Project Group.

Of the five elements of organizing presented by Ahrne and Brunsson (2011), two were fully implemented by the SLCA Project Group (membership and hierarchy), two partially implemented (monitoring and rules) and one was not (sanctioning).

This shows how multi-stakeholder initiatives might implement elements of organizing while remaining flexible. It also can shed light on what could have been done differently to obtain desirable results within such an initiative or project group. Should the monitoring be more defined? The hierarchy strengthened or loosened? Should rules be drafted and a process of sanctioning be explicit, or did the Life Cycle Initiative Project Group reach its optimal equilibrium with the way things were organized?

Finally, we can also see that without a form of *organizing* that is supported institutional, it is much more difficult for stakeholders to act jointly. The Life Cycle Initiative Project Group provided that supportive space leading to tangible results that still have ripple effects. However, without continuous organizational support (e.g., by the Life Cycle Initiative or some new source), how can the SLCA epistemic community continue to flourish and expand? What additional or alternative means could nurture the epistemic community?

4 Epistemic Communities as Interactive Processes

Ahrne and Brunsson (2011), followed by Rasche et al. (2013), provided useful insights on organizing. However, they did not look at how organizing can evolve over time. Glasbergen (2011) made a very relevant contribution in the form of an analytical tool that he called the "Ladder of Partnership" activity.

Indeed, partnerships are not frozen in time. They evolve as a result of their work plan, people in place, events, and the work of other initiatives. The Ladder developed by Glasbergen (2011) is based on the assumption that partnering is "a process in which actors restructure and build up new social relationships to create a new management practice". Partnering is thus considered to be an interactive process.

The model developed by Glasbergen was intended to study intersectoral partnerships that have a different focus compared to the Life Cycle Initiative—for example, commodities fair trade certifications. Science-based methodology development and dissemination are at the heart of the Life Cycle Initiative SLCA project group's raison d'être. We have already seen that by creating the project group, the Life Cycle Initiative provided an impulse to the development of an epistemic community that has become a community of practice. We have adapted the ladder

of partnership activities to reflect the reality of the Life Cycle Initiative SLCA Project Group.

Figure 4 presents an adaptation of The Ladder created by Glasbergen (2011) and consisting of five core levels in a partnering process, set in a time frame. Each step is represented by a core activity. The first level involves the building of trust and the exploration of collaborative advantage (we merged these two dimensions, which are separate in the Glasbergen model). In order to partner effectively, actors need to trust each other and also to perceive that the partnering will result in shared benefits.

The second level, constituting a rule system, looks at the interim effects in terms of outputs. In Fig. 3, we considered these activities as indicators that there was an epistemic community. It involves the creation of an internal code and the creation and communication of a code to the external world.

The third level refers to the implementation of the rule system. Gaining legitimacy in the relevant area(s) of the partnership is the main mechanism. This includes a search for the processes and partnerships that would help achieve a higher degree of dissemination and promote effectively increased organizational adoption of SLCA.

The fourth level regards the growth of the practice. If there is business uptake, students and practitioners will search for opportunities to build their capacities and, reversely, interns will bring new understanding would be a better word to businesses that may increase the rate of adoption and thus expand the practice. The dissemination and capacity building effect of the epistemic community reinforce the interactive processes at play.

The last activity, changing the political order, may be a deliberate outcome, but also the unintended societal consequence of the partnering process according to Glasbergen (2011). For example, it could refer to requirements set by investors regarding the social impacts of supply chains or change in trade policies.

Glasbergen has envisioned the Ladder to be further encapsulated in three dimensions. About the first, he writes that "in the course of the partnering process a gradual shift will take place from a focus on interactions among the partners themselves to interactions of the partnership with its relevant external environment" (2011). These are indicated as internal and external interactions.

The second dimension, of changing methodology, according to Glasbergen, refers to the core methods applied to bring the partnership forward over time. "The dimension of actor versus structure indicates the objects that are influenced: from the intentions of actors in a process, and their collaborations, to the more permanent impacts in the issue area in which the partnership is active and on the characteristics of the governance system" (2011).

In the third and final dimension, the Ladder of Partnership Activity (Fig. 4) represents an idealized form of the full partnering process. In reality, partnering is a continuous process with many feedback loops—for example, induced by evolving experiences of the partners, changes in their definitions of problems, their roles in the process, and changing circumstances (Collins and Ison 2009).

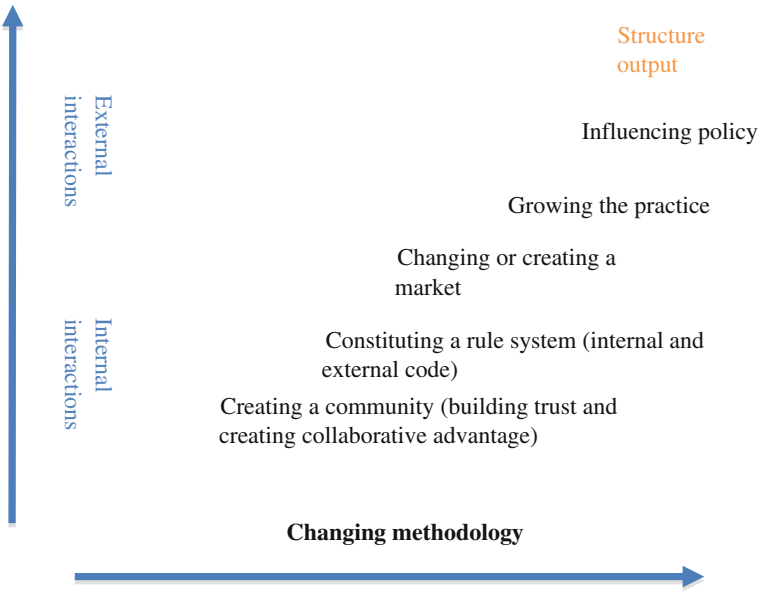

Fig. 4 Evolution of multi-stakeholder initiatives

However, the Ladder helps us better understand the heuristics of the partnering development processes in terms of the critical issues. It can also help us reflect on which types of organizational elements are most useful at which moment in the life of a multi-stakeholder initiative.

5 The Growth of the Epistemic Community, the Development of the SHDB

The publication of the SLCA guidelines and the complementary methodological sheets (UNEP-SETAC 2013) sparked interest in the technique and breathed life into a new domain of inquiry. The number of published articles has risen each year since the publication of the Guidelines, and the gray literature accounts for an increasing number of case studies (Jorgensen 2013).

In order to go beyond being a niche market curiosity, and to foster a greater uptake, SLCA practitioners needed supporting data and software, as was the case with Environmental LCA (ECLA). It has been remarked many times in the SLCA literature (e.g., UNEP-SETAC 2009; Dreyer 2010) that it is not possible to collect site-specific data for all processes in product supply chains. Therefore, these processes need to be prioritized. The SLCA guidelines proposed using the variables of labor intensity and risk level to prioritize production activities to be researched in

more detail. This can be done by making available what LCA practitioners call the "background data" that is used to conduct "scoping or hotspot assessment" (Curran 2012).

It was with the goal of making comprehensive and detailed information on supply chain human rights and working conditions available to everyone that the Social Hotspot Database (SHDB) project was launched in 2009. The SHDB is a project centered at New Earth, a not-for-profit organization focused on information systems for sustainability. A key aspect of the project has been to ensure that users have full, transparent access to information about working conditions and impacts in global supply chains, and also about the hundreds of sources drawn upon as well as the methods used to characterize risks within the SHDB. It can be considered a follow-up initiative to the development of the SLCA Guidelines.

Technically, the SHDB is an input/output life cycle inventory (LCI) database providing a solution to enable (1) the modelling of product systems, and (2) the initial assessment of potential social impacts. It is based on life cycle attribute assessment (LCAA), a methodology developed by Norris (2006). Each unit process has a number of different attributes, or characteristics, relative to a large set of social issues. The activity variable used in the SHDB is worker-hours; thus, the SHDB can be used to determine how many worker-hours are involved for each unit process in the supply chain, for a given final demand (final product or service output from the system). The sociosphere flows are expressed as worker-hours at a specified level of risk on a given risk indicator, per U.S. dollar of process output.

The SHDB system (Benoît Norris et al. 2013) is based on the Global Trade Analysis Project (GTAP) Version 7, a global economic equilibrium model (GTAP 2008). The total database contains data for 57 different sectors, in each of 113 different regions; most of these regions correspond to individual countries, while others are regions containing many countries. Thus, there are 6,441 unit processes in the database.

The labor intensity data were developed by converting GTAP data on wage payments into estimates of worker hours, skilled and unskilled, for each sector in each GTAP country/region. This was made possible by compiling and using wage rate data, for skilled and unskilled labor, by sector and region. These labor hour intensity factors are used, together with the social risk level characterizations, in order to express social risks and opportunities in terms of work hours, by sector and country, and at a given level of risk relative to each of over 22 social impact subcategories and nearly 150 different indicators. The risk data addresses five main impact categories: labor rights and decent work; human rights; health and safety; governance; and community.

The SHDB project draws upon hundreds of data sources from the International Labor Organization, the World Health Organization, the U.S. Department of Labor and State, the World Bank, and others. Quantitative statistics and qualitative information by country and sector are used to develop characterization models. These models assign a risk (or opportunity) level to the data so that users can identify target areas in their supply chains to verify or improve social conditions.

Although it is a project from a formal organization, the SHDB development process also has a lot in common with the ladder of activities specific to multi-stakeholder initiatives. As de Bakker et al. pointed out, the boundaries between different societal domains and their corresponding organizational forms have become increasingly blurred (de Bakker et al. 2013), and the SHDB is a good example of this situation. Even though it has been developed by a formal organization, in order to be relevant it needs to be supported by stakeholders and hence needs to rely on organizational flexibility and responsiveness to stakeholders' needs. One way to achieve this is to engage stakeholders in advisory boards; another way is to consult with stakeholders periodically. Hence, the SHDB has an advisory board composed of distinguished individuals from academia, businesses, governments, consultants, IGOs, and NGOs.

From creating a community (the advisory board), to constituting a rule system (the database), developing a market (making the database available and marketing it), and serving the SLCA wider epistemic community and user base (the main customers), the SHDB project follows the ladder of partnership activities model.

As this description implies, there is no doubt about the SHDB being socially shaped. It stems from the SLCA guidelines processes and is a hybrid tool that merges data, modelling, social sciences, CSR, and software. It is a tool at the intersection of a technique, social interests and business ethics—a tool created by researchers/consultants to serve the needs of businesses, governments, NGOs, consultants, and academics, and a tool constantly needing to be updated and improved to meet "customers" demands.

One critical point raised by Heiskanen regarding the uptake and institutionalization of ELCA was about the inclusion of ordinary market actors—namely, business managers, in the development, roll-out and application of the technique. Since business managers are the ones that will ultimately make use of the technique or its results, the tool needs to bring answers to problems that they face, be user-friendly, and be adaptable to different contexts.

Heiskanen also highlighted the discrepancy between global and local. She agreed that there is a necessity to transform local information to globally relevant data; however, she also argued that transforming this global information back to information relevant to the local context was a great challenge.

Perhaps this is also a challenge for SLCA in general, and the SHDB in particular. Although the science basis of the technique and tool is appreciated, are the tools grounded enough in the business and local context to achieve the primary goal sought: to bring enlightened understanding of the social impacts of supply chains?

6 Discussion and Conclusions

One of the main values of LCA discussed earlier, is that it can bring together the perspective of stakeholders at different stages of knowledge creation and utilization process, thus possibly leading to converging problem definition. However, how

possible is it to bring together people from the entire supply chain? Which stakeholders are most important to bring together? These are questions still largely unanswered. Perhaps the literature on value chain governance (for example, Gerrefi et al. 2005) can provide some useful perspective.

LCA and SLCA, with the SHDB, succeed in taking local information to produce global knowledge. They offer insights about the potential environmental and social impacts, but what else is needed to make this information meaningful to local actors and recipients of SLCA studies? Even if some businesses took part in the Life Cycle Initiative Project Group, or are members of the SHDB advisory board, or are member companies of CIRAIG International Life Cycle Chair or of the Sustainability Consortium, it is legitimate to ask whether the framework and tools available completely meet the needs. The epistemic community is spreading in the private sector, with many of the interns and managers being tasked with adapting the methodology and assessing the usability of various tools such as the SHDB. The existence and persistence of groups such as the Social Pioneer Roundtable, launched by a Pré consultant and comprising over a dozen participating companies, testify to the need that businesses have to boil down the research and the science-based tools to something very practical for their context.

We have seen that there seems to be a strong voice calling for increased stakeholder participation, both in LCA and SLCA development, but also regarding the involvement of stakeholders in studies. How can we make this practical? Based on this paper's findings, can we think of improved ways to organize multi-stakeholder methodology development activities that would encourage increased participation?

From our perspective, the SLCA Guidelines and the SHDB offer a broadening vision of reality in the sense intended by Ruggie (Haas 1992). We are right at the point where we might see the emergence of policies being shaped by its epistemes (for instance, EU 2013), but it remains critical to continue reflecting on how best to organize to create a more powerful and useful wave—which could foster more responsible and positive supply chains.

In conclusion, this article has refined our understanding of the social shaping of the SLCA technique and its institutionalization process. It has also demonstrated how multi-stakeholder partnerships organize to generate outputs, augmenting and validating the partial organization theory. We have also applied a modified version of the Ladder of Partnership that helped convey the dynamics of such initiatives. The efforts engaged in SLCA and SHDB development have succeeded in creating an episteme and expanded the practice significantly. In this paper, we have highlighted some avenues that could support a greater uptake of the method and intensify its institutionalization. Mindful care in the choice and design of organizational elements and attention to the flow of interactive processes could support initiatives reaching their objectives, and help make developments, such as the SLCA framework, even more effective in the future.

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