

Addressing the effect of social life cycle assessments

Andreas Jørgensen · Louise C. Dreyer · Arne Wangel

Received: 30 November 2011 / Accepted: 4 March 2012 / Published online: 16 March 2012
© Springer-Verlag 2012

Abstract

Purpose In the recently published ‘Guidelines for social life cycle assessment of products’, it is stated that the ultimate objective of developing the social life cycle assessment (SLCA) is to promote improvements of social conditions for the stakeholders in the life cycle. This article addresses how the SLCA should be developed so that its use promotes these improvements.

Methods Hypotheses of how the use of SLCA can promote improvement of social conditions in the life cycle are formulated, after which theories and empirical findings from relevant fields of research are used to address the validity of these hypotheses.

Results Three in some cases potentially overlapping SLCA approaches are presented, assumed to create a beneficial effect in the life cycle in different ways. However, empirical and theoretical findings show that the beneficial effects proposed to arise from the use of each of these three approaches may all be problematic. Some of these problems may be mitigated through methodological modifications.

Conclusions Given the significant problems in relation to creating an effect through the use of the SLCAs, and given the significant practical problems in applying the SLCAs, it is questioned whether the development of SLCA is a fruitful

approach for improving social conditions in the product life cycle.

Keywords Consequential SLCA · Educative SLCA · Lead Firm SLCA · SLCA · Social life cycle assessment · Stakeholder effect

1 Introduction

Any tool is developed because of its ability to solve or mitigate some problem. To take a trivial example, no one would develop a beer opener without considering its ability to open beers—its *raison d'être* lies in this function. In the same way, we are interested in developing the social life cycle assessment (SLCA) *only* because of its ability to solve or mitigate some problem. Different ideas as to what this problem could be can be imagined; however, in the recently published ‘Guidelines for Social Life Cycle Assessment of Products’ (Benoît and Mazijn 2009), it is stated that: ‘The ultimate objective for conducting an SLCA is to promote improvement of social conditions and of the overall socio-economic performance of a product throughout its life cycle for all of its stakeholders’. Thus, according to this statement, SLCA should be developed in such a way that its use in some way creates a more socially beneficial situation for the stakeholders in the product life cycle.

In our view, stakeholders of the product life cycle comprise both the groups and individuals being involved directly with the production, use and disposal of the assessed product (and parts hereof) as well as those merely being affected by the activities in these stages of the product life cycle. Based on this definition of stakeholders, it is clear that contradicting interests create a challenge with the overall goal to improve social conditions for all. As pointed out by

Responsible editor: Thomas Swarr

A. Jørgensen (✉) · A. Wangel
Department of Management Engineering,
Technical University of Denmark,
Produktionstorvet 426,
2800 Kgs. Lyngby, Denmark
e-mail: aj@man.dtu.dk

L. C. Dreyer
Brødrene Hartmann A/S, Corporate Sustainable Development,
Klampenborgvej 203,
2800 Lyngby, Denmark

Kruse et al. (2009): ‘...improving working conditions for employees (i.e., one group of stakeholders) could mean increased production costs for the employers (i.e., another stakeholder group), which in turn translates into increased prices for the consumer (i.e., a third group of stakeholders).’ In order to avoid dealing with the complexity of such trade-offs, this article focuses only on workers. The purpose of this article is to outline how SLCA could be developed in order to facilitate this goal of improving the social conditions for the workers in or affected by the product life cycle.

We will start by outlining two mechanisms through which social conditions for the workers may be changed through the use of SLCA, followed by a brief outline of three to some extent potentially overlapping SLCA approaches, which when used in a decision-making context presumably may facilitate this goal in different ways. Having outlined the main characteristics of these three different approaches to SLCA, we will, on the basis of empirical and theoretical findings from relevant fields of research, discuss potential problems with the effects presumed to arise from their use.

2 SLCA and the mechanisms for affecting social conditions for workers through its use

To our understanding, SLCA can be understood as a methodology for providing decision support about the social impacts related to product life cycles. Given the breadth of this definition, we believe that all contributions to the development of SLCA made in various publications can be captured under this definition. As decision support is understood as the primary outcome of the use of SLCA, we consider that the effect arising when using SLCA should stem from its use for decision support. Having outlined a definition of SLCA and the delimitation that the effect of SLCA should arise from its use in decision support, the next step is then to analyse how the SLCA can affect social impacts on workers in the life cycle. The first important step is to recognise that when SLCA is used in decision support, it can create changes in product life cycles. How this can happen will be explained in detail in Sections 3 to 5. Secondly, it is important to realise that there are basically two different mechanisms in which these changes in the product life cycle can lead to changes in social impacts on the workers. The first mechanism relates to the fact that different product life cycles are associated with different social impacts. Given this fact, it will therefore also be possible to affect the social impacts collectively affecting workers by increasing the production level of one product and lowering it for another. This is because increasing the production level of one product can be assumed for example to increase the number of employees exposed to the working

conditions at this company (all things being equal) and vice versa for a decrease in production. Given that working conditions differ in companies, one mechanism for affecting the social conditions for the workers is thus to *influence the production levels in companies*.

Besides this mechanism, it has also been claimed many times (e.g. Dreyer et al. 2006; Spillemaeckers et al. 2004) that social impacts are not, or only to a limited extent, related to the nature of technical processes, but rather to the conduct of the companies where they take place. This implies that the production of the same product can lead to different social impacts on the workers, depending on the conduct of the companies. The second mechanism through which social impacts on the workers can be affected is thus by *affecting the conduct of companies* in a favourable way.

These two mechanisms are the basis for the creation of the effect in the following description of the three SLCA approaches. The first approach, the consequential SLCA, presumably creates its effect through *influencing the production levels in companies* and thereby utilises only the first mechanism. The second approach, the educative SLCA, utilises both mechanisms, whereas the third approach, lead firm SLCA, seeks to create its effect only through *affecting the conduct of companies*.

3 The consequential SLCA

Consider the following situation: A decision-maker is faced with the choice between two or more different products (or choice between parts of a product). It is evident that a product causes a range of social impacts over its life cycle. As this is the case, an assessment showing the decision-maker what each of these products cause in terms of social impacts will enable her/him to choose the one leading to the most favourable social impacts. Had the decision-maker not had this assessment, a random choice in terms of social impacts would be made. Being able to choose the product which causes the most beneficial social impacts will hence on average lead to an improvement. The aim of the consequential SLCA is to enable this choice.

By choosing one product over the other, the decision-maker affects the demand for these products. By enabling this decision, the consequential SLCA thus creates its effect by increasing the demand for products, whose life cycle leads to the comparably best social impacts, and minimising the demand for products whose life cycle leads to the comparably worst social impacts. Hereby the consequential SLCA creates its effect simply by influencing the *production levels in companies* in such a way that the most beneficial situation in terms of social impacts is achieved given the decision alternatives. A schematic overview of how the effect is created is shown in Fig. 1.

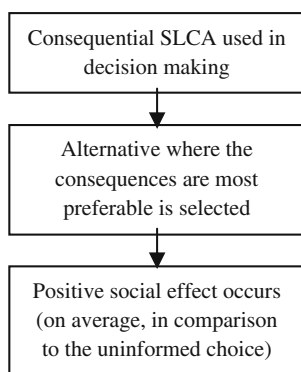


Fig. 1 Overview of how the consequential SLCA potentially creates a beneficial effect

3.1 Methodological requirements to the consequential SLCA

An SLCA, like an ELCA, is normally considered to comprise goal and scope definition, inventory analysis and impact assessment. Based on the outline of the functionality of the consequential SLCA above, we will, in the following, outline some methodological requirements for the consequential SLCA relating to these steps.

3.1.1 Goal definition

The goal of the consequential SLCA is to answer the question: What are the social impacts caused by decision alternative A, B...?

3.1.2 Scope definition

Product and social impact relationship Due to the at times vague connection between the technical process and the social impacts, as discussed by Dreyer et al. (2006) and Spillemaeckers et al. (2004), it has often been discussed in the SLCA community on what basis to allocate social impacts to the product (or functional unit). Suggestions have been to allocate on the basis of, for example, working time or value creation. In the consequential SLCA, this relationship between product and social impacts is, at least in theory, quite simple—given that the result of the consequential SLCA should be an outline of the impacts that a product is causing (see Section 3.1.1), then the social impacts which should be allocated to the product are the impacts which it causes. The impacts which the product causes can be seen as the difference between the social impacts in the situation where the product is produced and the situation where it is not. How this difference is found in more practical terms is outlined in the descriptions of the boundaries for the consequential SLCA below.

Boundaries A consequential SLCA with the goal of illustrating the social impacts which are caused by each assessed product can in many ways be developed in line with the consequential ELCA,¹ which also has as a goal to assess consequences of a decision, but on the environment. A first step of assessing the impacts of a product is to identify all the processes that change due to the decision, as pointed out by Weidema and Ekvall (2009). The processes that change as a result of the life cycle of each of the assessed products are often considered being located at the marginal producer,² which implies that the processes to include in the assessment are not necessarily located at the direct suppliers or customers. To exemplify this well-known phenomenon, consider the use of recycled aluminium in a product. Recycled aluminium is a highly demanded good with a limited production capacity. The argument goes that if a decision-maker chooses to include recycled aluminium in a product, other producers will have to use virgin aluminium instead, because of the limited market.³ The process that is affected through the inclusion of recycled aluminium in the product is therefore not the production of recycled aluminium from the chosen supplier but the production of virgin aluminium at the marginal supplier. The consequential SLCA thus assesses impacts in the *marginal life cycle* rather than the *direct life cycle*.

The second step is then to assess the social consequences at the marginal supplier, and here, a difference to the consequential ELCA method emerges, as pointed out in Jørgensen et al. (2010). Consequences are normally understood as the difference between two situations—to take the aluminium example, this difference can then be expressed as the social impacts when the virgin aluminium is produced and when it is not produced. This implies that in order to assess the consequences of the production of virgin aluminium, both what happens to the workers when the aluminium is produced and what happens when it is not produced—for example increased unemployment—need to be assessed. The consequential SLCA thus needs to assess impacts related to both *the realised and the non-realised situation*. This understanding of consequence is further elaborated in Jørgensen et al. (2010).

3.1.3 Inventory analysis

Given that the purpose of the consequential SLCA is to assess the consequences of a choice as accurately as possible, it is desirable to include data on as complete a range of social impacts as possible. This should be on both impacts

¹ See, for example, Weidema and Ekvall (2009) for details.

² The producer being affected by small changes in demand

³ More details can be added to the example, but as this example is only meant as an explanation, they are of no importance for this case.

relating to the realised and non-realised life cycle and should include both negative as well as positive impacts. As pointed out by Dreyer et al. (2006), what is desirable for the workers may vary, implying that the inclusion of site-specific impact categories may be preferable.

3.1.4 Impact assessment

As the consequential SLCA is about making choices between created differences and because this difference relates to different types of impacts (e.g. work-related impacts and unemployment-related impacts), it may be beneficial to present the assessment results ideally in one figure as this will allow for a more direct comparison than if results are presented in several incommensurable figures. This issue has often been addressed through modelling impacts towards endpoint. The idea behind modelling impacts towards endpoint is to utilise theoretical understandings of how the indicator scores influence the area of protection⁴ (AoP). Hereby, each indicator score relating to different social impacts can be translated into some degree of impact on the AoP. Modelling impacts towards endpoint may therefore in many cases be desirable in a consequential SLCA in order to be able to choose between different alternatives. An example of endpoint modelling related to social impacts is presented in Weidema (2006).

4 The educative SLCA

As the consequential SLCA, the educative SLCA also focuses on informing decision-makers whether to choose one product (or parts hereof) over another. In the consequential SLCA, the idea was that the assessment result should show the consequences of choosing each of the considered decision alternatives, hereby enabling the decision-maker in choosing the decision alternative leading to the most socially beneficial situation. Thus, in the consequential SLCA, no information about preferences of the decision-maker (in terms of a ‘good SLCA score’) needs to be passed on to third parties for this effect to take place; the effect of the consequential SLCA is assumed simply to arise from the change in demand that is created. Contrary to this, the educative SLCA is based on the idea that the preference of the decision-makers using the educative SLCA of a ‘good SLCA score’ is passed on to the market. The idea is thus that the ‘good SLCA score’ becomes a market parameter, hereby creating an incentive for companies to ensure a ‘good SLCA score’ for their product. The idea behind the educative

SLCA is thus to ‘educate’ the market towards behaving in such a way that their product can get a ‘good SLCA score’. In other words, a norm or code is defined (e.g. in terms of types of impacts to avoid or enhance, in (parts of) the product life cycle), and the purpose of the educative SLCA is then to assess to what extent this norm or code is upheld in relation to the assessed product. This idea about creating some kind of market advantage for producers living up to certain social standards is far from new. Consider for example various fair trade labels, where products are awarded a label, which in many cases gives the product a competitive advantage. An SLCA focusing on pushing companies to comply with social standards as the fair trade labels may be assumed to create a beneficial effect on the workers to the extent that this standard relates to working conditions.

By engaging in the market in this way, the effect of the consequential SLCA and the educative SLCA will differ significantly: Whereas the effect of the consequential SLCA is related only to the life cycles included in the decision alternatives, the effect of the educative SLCA could easily be imagined to arise outside the life cycle of the assessed product, as the idea in the educative SLCA is to push the market in general towards a certain conduct, and not only the product which the educative SLCA is assessing.

By educating the market in this way, the educative SLCA also creates its effect differently than the consequential SLCA. A consequential SLCA creates its effect merely by *affecting the production levels in companies*, as argued above. The educative SLCA may also create its effect by *affecting the production levels in companies*, as a company interested in performing well in relation to the code according to which the educative SLCA assesses the company may choose to only include suppliers in the product life cycle which perform well in relation to this code. However, a company may also have the possibility to ensure directly that, e.g. a supplier complies with the code, hereby also affecting *how companies manage their working conditions*. In this way, the educative SLCA, when pushing companies towards complying with a code, can presumably create its effect through two mechanisms rather than only one. An illustration of the line of argument for a beneficial effect to arise from the educational SLCA is shown in Fig. 2.

4.1 Methodological requirements to the educative SLCA

Contrary to the consequential SLCA where a range of specific methodological requirements could be outlined, it is in many cases not possible to set a definite set of requirements for the educative SLCA. The reason is that in the educative SLCA, the code or norm according to which the educative SLCA assesses the company has not been defined, but may be defined according to the interests of its users. In the outline above of how the educative SLCA creates its effect,

⁴ Area of protection is a term originally defined in environmental LCA to represent the classes of environmental endpoints that society wants to protect (Udo de Haes et al. 1999).

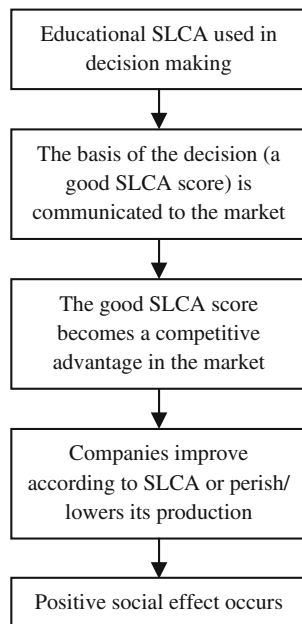


Fig. 2 Overview of how the educative SLCA potentially creates a beneficial effect

it was merely stated that it should assess how a product life cycle performs in relation to this code. But given that the code is not defined, what in detail the educative SLCA should assess is not defined. In comparison, in the consequential SLCA methodology, it is clearly stated that it is to assess all social impacts caused by the product. This definition of what the consequential SLCA should assess was used to outline the methodological requirements for the consequential SLCA; i.e., in order to assess the impact caused by a product, the assessment needs to include an assessment of the marginal life cycle, etc. (see Section 3.1). These methodological requirements can therefore only to a very limited extent be defined for the educative SLCA. To the extent possible, the methodological requirements for the educative SLCA will be discussed below.

4.1.1 Goal definition

The question that the educative SLCA should answer is: How is A, B... performing in relation to a defined code?

4.1.2 Inventory analysis and impact assessment

It was stated above that the code according to which product life cycles are assessed in the educative SLCA is not defined. There is, however, one thing which can be stated about the code: It should promote impacts on workers which by the workers are considered positive, and discourage impacts on workers which they find negative. If this is not the case, it seems difficult to expect that any social improvements should arise from companies complying with the

code. As mentioned in relation to the consequential SLCA, it may be preferable to consider site-specific impact categories also in relation to the educative SLCA, as what is important for the worker may vary from context to context (Dreyer et al. 2006).

Beside this rather limited requirement, it may be expected that, for the SLCA to work most effectively, it may be assumed that some methodological stability is necessary so that a clear message can be sent to the market, as it can be assumed easier for a market to cope with a standardised assessment rather than an assessment changing from case to case. Defining a fixed code, against which to assess the performance of companies in the educative SLCA relating to both the scope of the assessment as well as to how and what to measure and how to interpret this therefore seems central. This type of methodological stability is less central when it comes to the consequential SLCA.

5 The lead firm SLCA

The consequential and educative SLCA are tools which enable decision-makers external to the assessed product life cycle to affect the social impacts related to this. If the decision-maker on the other hand is a company manager, she/he may have other possibilities. She/he may be in the position to change the conduct of her/his own company as well as to some extent that of companies up- and downstream of the product chain. If the decision-maker is interested in improving the social conditions for the workers in the part of the life cycle which she/he can influence, some assessment is necessary to identify where improvements can take place. The lead firm SLCA is here understood as an assessment tool for performing this assessment. The lead firm SLCA is directed towards identifying processes where improvements of social conditions can take place, which can be seen as a necessary decision support for the decision-maker to know where to focus her/his management efforts to improve the situation. For an effect to arise from the use of the lead firm SLCA, an additional ‘management activity’ is thus needed.

The lead firm SLCA is thereby only directed towards improving the management of working conditions in the companies already included in the product chain. The lead firm SLCA in this way is only focused on *changing how companies manage their working conditions*. In comparison, the educative SLCA created its effect both through affecting *how companies manage their working conditions* and through affecting *the production levels in companies*, whereas the consequential SLCA focused only on the latter.

On this basis, many will probably find the lead firm SLCA somewhat narrow in its functionality, as many companies engaged in improving the conduct of their supply

chain would probably in many cases not only focus on improving the conduct of the existing chain, but also on *changing* the chain, hereby affecting *the production levels in companies*, for example if a supplier is unwilling to comply with the demands set by the user of the lead firm SLCA, or to increase leverage in the supply chain. In this regard, it should be noted that the idea behind the lead firm SLCA as outlined here does not support this kind of decision. Thus, whether or not the use of the lead firm SLCA in a decision situation relating to for example excluding a supplier (i.e. affecting *the production levels in companies*) may lead to any beneficial effect on the workers will not be discussed in this article, as it is considered outside the functionality of the lead firm SLCA. Should the user of the lead firm SLCA be interested in taking these kinds of decisions, the lead firm SLCA could be combined with other approaches like the consequential or educative SLCA. An illustration of the line of argument for the effect to arise from the lead firm SLCA is shown in Fig. 3.

5.1 Methodological requirements to the lead firm SLCA

When outlining the methodological requirements for the lead firm SLCA, it is difficult to outline definite methodological requirements. From the outline above, it was only stated that the lead firm SLCA should assess improvement potentials in the product life cycle. However, what exactly these improvement potentials are and in what parts of the product life cycle they are sought are undefined. As in the educative SLCA, very few requirements can therefore be set for the methodology. However, to the extent possible, methodological requirements for the lead firm SLCA will be outlined below.

5.1.1 Goal definition

The goal of the lead firm SLCA is to answer the question: What conduct of companies, which the decision-maker has

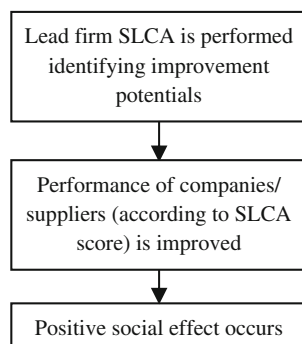


Fig. 3 Overview of how the lead firm SLCA potentially creates a beneficial effect

the power to influence, can be improved in terms of impacts on the workers?

5.1.2 Scope definition

Given that the lead firm SLCA is only about improving how companies *manage their working conditions*, as outlined above, the lead firm SLCA should, contrary to the educative and consequential SLCA, only include the parts of the life cycle the decision-maker through available channels has power to influence. Any inclusion of processes beyond these will not provide the decision-maker with any information that can be used for improving the social conditions. This also implies that it will probably often not make sense to identify the marginal supplier as needed in the consequential SLCA, since the marginal supplier will often not be in any direct relation with the decision-maker, making the conduct of the marginal supplier difficult to influence directly.

Given that the lead firm SLCA is only directed towards improvements of the existing chain and the decisions based on the lead firm SLCA in this way are only related to the *realised life cycle* rather than the *non-realised life cycle*, like the consequential SLCA, it does not make sense to consider the non-realised life cycle in the lead firm SLCA, as it was defined in relation to the consequential SLCA above.

5.1.3 Inventory analysis and impact assessment

The impact categories included in the lead firm SLCA should be of importance to the workers, but should also be possible to affect for the decision-maker. There may be, for example, impacts which are highly relevant for the workers, but which the decision-maker does not have the power to influence. For example, it has been reported that issues like freedom of discrimination for workers in the supply chain can be difficult to influence for the product chain owner, whereas issues like wages are more easily affected (Barrientos and Smith 2007). Depending on the resources of the lead firm SLCA user, the user may in some cases find it impossible to affect some types of impacts, and including these in the lead firm SLCA will therefore not provide any usable decision support. However, what impacts the lead firm SLCA user has the power to influence in the life cycle will be fully dependent on the actual situation. It is therefore not possible to set up general guidelines for what impacts to include and what not to include in the assessment. However, given that the purpose of lead firm SLCA is to improve existing conditions, it will probably in most cases only be relevant to include ‘negative impacts’ rather than positive impacts, as the motivation for improving positive impacts can be expected to be small.

6 Summarising similarities and differences for the three SLCA

On the basis of the discussions above, Table 1 summarizes the three different SLCA.

7 Evaluating the evidence

It is far from straightforward to evaluate the claims made about the effect of the various types of SLCA presented above. To perform such an analysis based on existing SLCA case studies would be problematic, both because very few SLCA case studies have been made so far, but also because it is very difficult to see whether these studies e.g. have had an ‘educative effect’ on the market. This investigation therefore has to be based on empirical or theoretical findings relating to some overall characteristics of the SLCA methodologies presented here.

As mentioned throughout the article, the SLCA approaches presented here seek to create an effect through two fundamentally different mechanisms: through affecting *how companies manage their working conditions* and through affecting *the level of production from companies*. The following analysis is divided into addressing the effect of each of these two mechanisms as this has been addressed by different fields of research. As it was mentioned in the sections above, consequential SLCA only affects the level of production, and the lead firm SLCA affects only how companies manage their working conditions, whereas the educative SLCA can affect both levels.

7.1 Problems with the effect of SLCAs affecting *how companies manage their working conditions*

As outlined above, both the lead firm and the educative SLCA attempt to affect how companies manage their working conditions. In the educative SLCA, the idea is that companies comply in order to be an attractive business partner, and in the lead firm SLCA, the idea is that a product chain owner uses her/his leverage to improve performance in accordance with the defined norm or code.

The idea of making companies comply with a code is not new. In many cases, companies are for example by product chain owners already being presented to a so-called code of conduct (CoC), which generally is a specification of how the company and potentially its suppliers should act according to a list of social issues, among others. Many of these CoCs relate to international consensus documents on social issues and thereby address issues quite similar to what has been considered in many SLCA approaches.⁵ It therefore seems

reasonable to expect that the effect of companies managing their working conditions in accordance with a code will be the same regardless of whether the code is set through an SLCA or a CoC. However, it should be noted that also other issues, such as ‘number of trainees’ in a production, have been considered in SLCA approaches (Schmidt et al. 2004), which falls outside the issues normally dealt with in CoCs, and for these specific cases, other effects than addressed here can be imagined.

The effect of complying with a CoC has been addressed by Barrientos and Smith (2007) and Bezuidenhout and Jeppesen (2011). Bezuidenhout and Jeppesen (2011) address the effect of the implementation of codes through a range of interviews with workers from Lesotho, South Africa and Swaziland. On the basis of the worker's perception of effect, it is concluded that due to what seemed to be inefficient monitoring procedures, and maybe therefore a lack of enforcement, workers found the impact of implementing and enforcing these codes negligible. In line with this, Locke et al. (2006) and Pruett (2005) also address the effect of monitoring compliance with a code and conclude that it only has an effect if it is supported by actions tackling underlying causes of the poor working conditions, such as training and education of workers about their rights (Pruett 2005).

Barrientos and Smith (2007) adds nuances to the discussion by concluding that complying with a CoC may improve what they term as outcome standards, which relate to issues such as wages, working hours and the implementation of a health and safety policy, whereas codes will have little influence on what they term process rights, which can be understood as freedom of discrimination, the right to organise, etc.

Generalising from these findings, it seems that complying with a CoC does not necessarily imply an improvement of the working conditions, which the code addresses. However, it may have a beneficial effect, probably more so if thorough monitoring is performed followed up by in-depth interventions, such as training and education of workers, and especially on outcome standards. This indicates that if the lead firm and educative SLCA are going to have a beneficial effect, this is best supported if thorough monitoring techniques need to be applied followed up by in-depth interventions. The thoroughness of monitoring techniques applied in SLCA relates to how the data included in the assessment are collected. As was discussed in Jørgensen et al. (2008) different types of data have been considered to be used in SLCA in general. Some have argued for data relating to, e.g. process or sector, others have argued that data need to be collected at the site of the specific company included in the assessment. Given the generic character of process or sector data, it can hardly be characterised as thorough monitoring. Others have argued for the use of

⁵ See ‘UNEP Guidelines for social life cycle assessment of products’ (Benoît and Mazijn 2009).

Table 1 Summary of the three SLCA

| | Consequential SLCA | Educative SLCA | Lead firm SLCA |
|--|---|---|--|
| Decision support | Choice between products/components or services | Choice between products/components or services | Prioritisation of effort to manage conduct of companies |
| SLCA user | External decision-maker | External decision-maker | Internal decision-maker |
| Creation of effect | Affecting the level of production in companies, so that components are produced where they have the most beneficial social effect | A good SLCA score is introduced as a competitive factor in the market, pushing companies towards compliance with SLCA norms or out of the market. | Conduct of companies are improved in terms of negative effects on workers. |
| Object to assess | Consequences of producing more/less throughout as much of marginal life cycle as possible | To what extent companies in defined life cycle comply with code of conduct set in the SLCA | Conduct of companies towards workers in part of the life cycle which the decision-maker has a possibility to influence |
| Additional activity necessary for the effect to arise besides considering assessment in decision | None | Communication to market about preferences set in the SLCA | Managing conduct of companies |

site-specific data in SLCA; however, in this connection, O'Rourke (2000) shows that even site-specific data collected from the monitoring of specific companies may both be very superficial, not capturing critical issues at the working place, and more in-depth where these issues are more likely to be found. To ensure the effect of using the lead firm and educative SLCA, thorough site-specific data should thus be used. However, from a practical perspective, to perform in-depth monitoring of several stages or the entire life cycle may be a significant task, which may at times not even be possible due to the inability of companies to get information about who their suppliers actually are (Jørgensen et al. 2009). Given that thorough site-specific data are needed, this may significantly limit the usability of the assessment.

Besides thorough monitoring, in-depth interventions are needed, as argued above. Especially in relation to the educative SLCA, this poses a problem. In the educative SLCA, the idea is that non-complying companies should be excluded from the life cycle, as this is what should motivate companies to change the way that they manage their working conditions. Given that exclusion hardly can be seen as interventions tackling the underlying causes of poor working conditions, as advised in the literature above, it may be questioned whether this threat of exclusion is the most effective tool in improving the working conditions. In the lead firm SLCA, the response to non-compliance will depend entirely on the policy of the company performing the lead firm SLCA. Everything from very superficial to more in-depth interventions, as advised by Locke et al. (2006) and Pruett (2005), can be imagined. This implies that the effect of complying with the standard set through the SLCA may vary not only within different uses of the lead firm SLCA but also between the lead firm and educative SLCA.

In continuation with this, Humphrey and Schmitz (2000) have shown that the enforcement of standards in chain

governance is a mixed blessing. Standards set barriers for new entrants and for local upgrading; they may help local producers to rapid product and process upgrading, but make it difficult for them to progress into the design and marketing functions of the chain. Complying with a code, as demanded in the lead firm and educative SLCA, may thereby not only have a limited effect, it may even create some negative frames for companies which can be difficult to escape.

A very different problem relates to the overall idea of creating a beneficial effect on the workers by affecting the conduct of companies through private regulations, for example through the lead firm and educative SLCA presented here. The argument is first of all that the introduction of CoCs, fair trade labels and others is considered to have a limited effect on the overall conduct of the market, whereas the continuing role of state regulation remains key for large improvements of social conditions to happen (Lobel 2010). The potential problem with this is that the rise of private regulation is argued to displace public regulation (Bartley 2005). This 'displacement hypothesis' conceptualizes private and public forms of authority as pushing against one another, so that as one rises in importance, it crowds out the other. Many practitioners working with labour and human rights are concerned that these forms of private authority displace more effective ways of improving labour conditions. Furthermore, it is argued that this form of authority poses a democratic problem because of its rootedness in the private world (Bartley 2005). At the current state of knowledge, the displacement hypothesis has only gained limited empirical support, but should later findings confirm this hypothesis, this could question the entire idea of engaging in improving the conduct of companies using private initiatives for regulating the conduct of companies, such as the lead firm and educative SLCA are intended to do, simply

because of its displacement of a more effective public regulation.

7.2 Problems relating to the effect of SLCA's affecting to which companies to source

As mentioned above, both the consequential and educative SLCA's affect the production levels in companies. The overall idea behind creating an effect from affecting the production levels is that by producing more in some companies, more workers will be employed at these companies and experience the working conditions at this company, and vice versa. By affecting the production levels in the right way, social conditions may thereby be improved. The SLCA in other words creates advice about which connections to companies should be cut or minimised and which should be kept, created or maximised.

In this context, the 'cut and run' phenomenon is relevant to mention. The cut and run phenomenon refers to the situation where a company chooses to cut its connection to a supplier due to, in this case, a poor performance in the SLCA.

This phenomenon has been studied in the CSR literature, where it is shown that this conduct may be related to various negative social consequences. For example, in 2003, Nike discovered that one of their suppliers, Saga Sports in Pakistan, employed child labour. In fear of moral condemnation from their customers, Nike chose to sever their contract with the company. But since 70 % of Saga Sports' production went to Nike, many of the 4,000 workers were dismissed, impacting not only the workers but also the local society, where an estimated 20,000 people depended on the income (Montero 2006). Other examples are also mentioned by Lund-Thomsen (2008). In this way, cutting and running seemingly left the workers and their families worse off. From a conceptual level, cutting and running seems, at least on the short run, to allow for two possibilities; either the company closes down or lowers its production, most likely leading to lower employment, as in the Nike case above, or in some cases, it may be able to sell its products to other buyers, hereby avoiding to lower its production. Should the latter be the case, then it seems that the SLCA would not create any change in the production at this company, and it will therefore not create any change in the number of workers experiencing the working conditions at this company, meaning that it will not create any effect at this company. If the cutting and running on the other hand leads to lower employment, as intended if the SLCA is to have an effect through affecting which companies are included in the life cycle, then on the individual level, social impacts related to increased unemployment will occur or workers may try to find other, and potentially worse, jobs (since the workers did not take the job in the first place), as proposed by Lund-Thomsen (2008).

As mentioned above, it is not a necessary consequence of the cut and run strategy that negative impacts will arise, but the general idea of actually creating a positive effect through the cut and run strategy may in this way be problematic. It should, however, be emphasised that the effects reported above of the cut and run strategy mentioned here only are the relatively short-term impacts. What the long-term impacts of the cut and run strategy may be is unknown, as no studies to our knowledge address this issue.

Still, these problems question the idea of achieving an effect through regulating which companies are included in the life cycle, which may be done in all types of SLCA's mentioned here. However, an important distinction is necessary at this point: If the SLCA includes both an assessment of the realised and the non-realised marginal life cycle, as needed in the consequential SLCA, the picture is somewhat different, as the impact of the cut and run strategy would be included in the assessment. The reason is that the assessment of the non-realised life cycle exactly assesses what happens if something is not produced, which is what happens when cutting and running. Thus, as long as the assessment includes the potential impacts of cutting and running, which is at least the case for a consequential SLCA as described here, then this phenomenon does not compromise the potential effect of using the SLCA in decision support.

However, from a practical perspective, a major problem related to the assessment of both the realised and non-realised life cycle is that its assessment is not straightforward and does not lead to a singular, unambiguous answer in neither situation. The social impact assessment of a production activity being performed and of the alternative activity being abandoned will both reveal complex situations of positive as well as negative dimensions. For example, based on an analytical framework of Bolwig et al. (2010) and a practical guide for strategizing interventions by Riisgaard et al. (2010), a number of product case studies conducted on the basis of laying out the advantages and disadvantages for various types of small producers for participating or not participating in a given global value chain conclude that the involved stakeholders need to negotiate the range of options available and decide on a strategy of action in order to create a beneficial situation. These findings, in addition to those made by Jørgensen et al. (2010) regarding the difficulties in identifying who is actually affected by the changing of production levels, suggest a significant limitation to the usability of the methodology.

7.3 Problems relating to the long-term effect of SLCA's

Besides the above critique relating to the usability of the consequential SLCA, no critique of the effect of the consequential SLCA as such has been raised. The reason for this

is that the consequential SLCA assesses the (social) effect of performing a given choice, and given that the assessment is correctly performed, the effect of following the advice given by the consequential SLCA will equal the effect assessed in the consequential SLCA. The effect of the consequential SLCA, therefore, in theory, seems bulletproof. However, in practice, assessing the long-term effects of taking a given decision may be very difficult, and it therefore seems likely that the effect which can be considered in a consequential SLCA are there present direct effects. In relation to consequential SLCA, this opens up to a problem, which to our knowledge has not been backed up by empirical findings: In contrast to some forms of the educative and lead firm SLCA, the consequential SLCA will not see poor working conditions as problematic if only the alternative for the worker is worse: A consequential SLCA will give a ‘good score’ to an alternative, if the *change* that the implementation of an alternative is creating is beneficial, regardless of the *actual* working conditions. In this way, a consequential SLCA does not set any kind of standards for the *actual* working conditions, in contrast to some forms of the educative and lead firm SLCA. In a short-term perspective, this makes sense: A person who is, e.g. no longer starving, will most likely see poor working conditions as being preferable as opposed to not having a source of income. However, in the long run, what does this imply for the development of a region? Without a certain minimum standard for working conditions, companies may continuously undercut on working conditions to cut costs, which will be fully endorsed in a consequential SLCA, as long as the situation without work is even worse. In this way, the use of a consequential SLCA may, if not create, then at least allow for a ‘race to the

bottom’ to occur. Types of educative and lead firm SLCA not assessing the *change* that the implementation of an alternative is creating, as the consequential SLCA does, but focuses on the *actual* working conditions will on the other hand promote a certain standard for the working conditions, and will in this way not allow for a race to the bottom to occur. However, it should be emphasised that whether this will actually happen as a result of the use of consequential SLCA is highly uncertain, but must be expected to depend heavily on the context in which it is used, for example whether there are already other regulations (private or public) in play, which sets minimum standards, e.g. for working conditions, alleviating this problem. The potential problems relating to the effect of each of the three proposed SLCA are summarised in Table 2.

8 Relating the three approaches to SLCA to existing SLCA methodologies

Having outlined three different approaches to SLCA, it seems very natural to ask: How can existing SLCA methodologies be categorised according to these presented SLCA approaches? From one perspective, it seems easy to argue that most proposed methodologies can be characterised as belonging to the educative SLCA, as none of them include the non-realised life cycle, which was argued to be necessary to include in a consequential SLCA, and most approaches do not set the system boundaries according to the influence of the decision-maker as is proposed in the lead firm SLCA. However, from another perspective, such categorisation of existing approaches according to a these

Table 2 Potential problems and possible ways to mitigate these related to the three SLCA

| | Consequential SLCA | Educative SLCA | Lead firm SLCA |
|--|--|--|---|
| Potential problems in achieving effect | <ol style="list-style-type: none"> 1. No hindrance to a ‘race to the bottom’ 2. Very complex to assess realised and non-realised life cycle | <ol style="list-style-type: none"> 1. Cut and run, potentially leaving the workers in a poorer situation 2. Threat of exclusion of product chain does not solve root causes of non-compliance and may therefore have limited effect 3. Codes can create barriers for entrants and local upgrading 4. Crowding out of governmental regulation | <ol style="list-style-type: none"> 1. Codes can create barriers for entrants and local upgrading 2. Crowding out of governmental regulation |
| Potential methodological elements to alleviate problem | <ol style="list-style-type: none"> 1. Consequential SLCA should only be used in contexts where minimum requirements for working conditions are set. 2. ? | <ol style="list-style-type: none"> 1. Focus assessment on impacts of both realised and non-realised marginal LC. This, however, may prove very complex. 2. ? 3. ? 4. ? | <ol style="list-style-type: none"> 1. ? 2. ? |

new categories of SLCA is problematic because what separates the three SLCA approaches is to a large extent implicit in existing SLCA methodologies. As outlined in Table 1, what separates the SLCA approaches relates for example to the decision the SLCA is to support, who the SLCA user is and how it is intended to create an effect. In most SLCA methodology descriptions, these issues are not explicitly stated. Rather, the descriptions focus on system boundaries, what impacts to include, on what basis to allocate impacts to the product, etc. But whereas several of these issues are defined for the consequential SLCA, very little is defined for the educative and the lead firm SLCA. This implies, for example, that the approach presented by Jørgensen et al. (2010) which basically outlines how to perform consequential SLCA could also be categorised as an educative SLCA with the aim of ‘educating’ the market towards ensuring the best consequences of a product. In the same way, the ‘Guidelines for Social Life Cycle Assessment of Products’ (Benoît and Mazijn 2009), which can easily be perceived as an educative SLCA, can also be an SLCA attempting to benefit the workers in another way than through the mechanisms considered here, a lead firm SLCA relating to value chain owners with a large influence in the chain or simply be a consequential SLCA that was constructed before the expanded system boundaries advocated for in Jørgensen et al. (2010) (notice the publication years) were considered. Performing these categorisations without knowing the intentions behind the methodology and how it was meant to be applied therefore seems somewhat speculative. Rather than providing such categorising framework, this article should be seen as a guide for how to develop SLCA in order to achieve its overall goal.

9 Concluding remarks and outlook

Based on the claim that the purpose of developing SLCA is to improve social conditions in the life cycle, three SLCA approaches, the consequential, educative and lead firm SLCA, have been outlined, proposed to create a beneficial effect on workers in different ways. The methodological requirements for each of the methodologies were to the extent possible outlined showing distinct features but also potential overlaps between the methodologies. On the basis of empirical and theoretical findings from other fields of research, it was shown that problems relating to the proposed effect may be raised for each of the approaches, implying that the effect, which was proposed to arise, in most cases may be questioned. Most problematic seemed to be the educative SLCA, to some extent depending on which methodological elements it includes. In this regard, this small analysis points out that the decision based on an assessment of only the direct realised life cycle based on superficial site-specific or

process or sector data communicated to the public, will most likely not lead to any positive effect, but may through ‘cut and run’, minimal effect of compliance and crowding out of public regulations, even worsen the situations for the workers. As outlined in Table 2 the effect of the educative SLCA may be improved by including the same system boundaries as a consequential SLCA, but still several problems remain where no methodological changes could be identified that could mitigate the problems. The consequential SLCA and the lead firm SLCA both seemed more promising; however, in relation to both the approaches, significant problems related to their effect were also identified.

This article has as mentioned only addressed the effect on the workers in the life cycle, which is only one of the several stakeholder groups relevant to consider in a SLCA, and this study should therefore only be seen as a preliminary study of the effects of SLCA. But if we accept the findings of this article, and if future studies of the effect of SLCA on other stakeholders do not come to radical different conclusions, i.e. that significant beneficial effects may be achieved through the use of SLCA for other stakeholders, or through other mechanisms than addressed here, then our results indicate some critical problems related to the idea of developing an SLCA as defined in Section 2 with the end goal of improving social conditions for the stakeholders. This seemed especially to be the case for the educative SLCA whereas for both the lead firm and consequential SLCA, our results were a little less bleak. Bearing this in mind, we strongly encourage our colleagues in the SLCA community to pursue further this research agenda about the effect of the SLCA for the stakeholders in order to shed light on this crucial topic. While this agenda will include further elaboration and general questioning of a methodological framework for SLCA, we also envisage the exploration of the basic question about what life cycle thinking has to offer in assessing social impacts of product chains.

Acknowledgments We would like to thank Julie Parent from UQAM, Montreal, Canada; participants at the Second International Seminar on SLCA held in Montpellier, France, in 2011 and two anonymous reviewers for valuable comments.

References

- Barrientos S, Smith S (2007) Do workers benefit from ethical trade? Assessing codes of labour practice in global production systems. *Third World Q* 28:713–729
- Bartley T (2005) Corporate accountability and the privatization of labor standards: struggles over codes of conduct in the apparel industry. *Res Polit Sociol* 14:211–244
- Benoît C, Mazijn B (2009) Guidelines for social life cycle assessment of products. UNEP, Nairobi, UNEP/SETAC Life Cycle Initiative

- Bezuidenhout A, Jeppesen S (2011) Between the state, market and society: labour codes of conduct in the Southern African garment industry. Submitted to Dev. South Africa
- Bolwig S, Ponte S, du Toit A, Riisgaard L, Halberg N, Matose F (2010) Integrating poverty and environmental concerns into value-chain analysis. A conceptual framework. *Dev Pol Rev* 28:173–194
- Dreyer L, Hauschild M, Schierbeck J (2006) A framework for social life cycle impact assessment. *Int J Life Cycle Assess* 11:88–97
- Humphrey J, Schmitz H (2000) Governance and upgrading: linking industrial cluster and global value chain research. University of Sussex, Institute of Development Studies, Brighton
- Jørgensen A, Le-Boqc A, Nazakina L, Hauschild M (2008) Methodologies for social life cycle assessment. *Int J Life Cycle Assess* 13:96–103
- Jørgensen A, Hauschild M, Jørgensen MS, Wangel A (2009) Relevance and feasibility of social life cycle assessment from a company perspective. *Int J Life Cycle Assess* 14:204–214
- Jørgensen A, Finkbeiner M, Hauschild M (2010) Defining the baseline in social life cycle assessment. *Int J Life Cycle Assess* 15:376–384
- Kruse SA, Flysjö A, Kasperczyk N, Scholz AJ (2009) Socioeconomic indicators as a complement to life cycle assessment—an application to salmon production systems. *Int J Life Cycle Assess* 14:8–18
- Lobel O (2010) Crowding out or ratcheting up? Fair trade systems, regulations and new governance. University of San Diego. Legal Studies Research Paper Series. Research paper no. 10–023. At: <http://ssrn.com/abstract=1612986>. Accessed 21 Jan 2011
- Locke R, Qin F, Brause A (2006) Does monitoring improve labour standards? Lessons from Nike. Corporate Social Responsibility Initiative, working paper no. 24. John F Kennedy School of Government, Harvard University, Cambridge
- Lund-Thomsen P (2008) The global sourcing and codes of conduct debate: five myths and five recommendations. *Dev Change* 39:1005–1018
- Montero D (2006) Nike's dilemma: is doing the right thing wrong? The Christian Science Monitor. At: <http://www.csmonitor.com/2006/1222/p01s03-wosc.html>. Accessed 1 Feb 2011
- O'Rourke D (2000) Monitoring the monitors: a critique of PricewaterhouseCoopers (PwC) labor monitoring. Massachusetts Institute of Technology. Working paper
- Pruett (2005) Looking for a quick fix: how weak social auditing is keeping workers in sweatshops. Clean Clothes Campaign. At: http://www.eu-china.net/web/cms/upload/pdf/materialien/ccc_2005_quick_fix_08-04-29.pdf. Accessed 6 Sept 2011
- Riisgaard L, Bolwig S, Ponte S, Du Toit N, Halberg N, Matose F (2010) Integrating poverty and environmental concerns into value-chain analysis. A strategic framework and practical guide. *Dev Pol Rev* 28:195–216
- Schmidt I, Meurer M, Saling P, Kicherer A, Reuter W, Gensch C (2004) SEEBalance—managing sustainability of products and processes with the socio-eco-efficiency analysis by BASF. *Greener Manag Int* 45:79–94
- Spillemaeckers S, Vanhoutte G, Taverniers L, Lavrysen L, van Braeckel D, Mazijn B, Rivera JD (2004) Integrated product assessment—the development of the label ‘Sustainable Development’ for products ecological, social and economical aspects of integrated product policy. Belgian Science Policy, Belgium
- Udo de Haes HA, Jolliet O, Finnveden G, Hauschild M, Krewitt W, Müller-Wenk R (1999) Best available practice regarding impact categories in life cycle assessment. *Int J Life Cycle Assess* 4:66–74
- Weidema BP (2006) The integration of economic and social aspects in life cycle impact assessment. *Int J Life Cycle Assess* 11:89–96, Special issue
- Weidema BP, Ekvall T (2009) Consequential LCA. Chapter for CAL-CAS (Co-ordination Action for Innovation in Life-Cycle Analysis for Sustainability) deliverable D18 “Guidelines for applications of deepened and broadened LCA”. At: http://www.lca-net.com/files/consequential_LCA_CALCAS_final.pdf. Accessed 10 Feb 2011