

Systematic review of Social-Life Cycle Assessment (S-LCA) case studies

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1. Context

Social Life Cycle Assessment (S-LCA), is a methodology standardised in 2009 with the emanation of the “Guidelines for Social Life Cycle Assessment of Products” by UNEP/SETAC. This methodology, although being not yet as widespread as other Life Cycle Thinking tools, is generating a growing interest, evidenced by an increasing number of related academic papers and case studies.

The concept of positive impacts arise in the field of Social Impact Assessment (SIA), for example Vanclay (2003), introduces concepts that stimulate a new vision of Impact Assessment (IA), not only seen as a mere methodology aiming at calculating negative impacts, but also assuming a positive connotation for a proactive and better development of outcomes.

The goal of this paper is to analyse the S-LCA case studies published between 2006 and 2014 in order to detect whether any positive impacts have been underlined along with the negative ones. To better understand this goal it is useful to define what a social impact is. A clear definition can be found on page 107 of the Guidelines and Principles for Social Impact Assessment (1994): “the consequences on human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize themselves so as to meet their needs and generally cope as members of society.” Starting from this concept, it is possible to try to give a definition of what social positive impact is, and to better understand the purpose of the present study.

To better analyse the role of positive impacts in S-LCA, a questionnaire was edited and sent to all the authors of the case studies collected along with a number of experts in the S-LCA field.

2. Method

A systematic review of S-LCA case studies was implemented to conduct this paper.

The search engines used in this review were: Google Scholar, Scopus and the Discovery browser (by EBSCO Host) accessed from the University "G. d'Annunzio". The keywords used to conduct the research were the following: "Social Life Cycle Assessment" case study, SLCA case study, "Social LCA" case study, Social LCA case study, Societal LCA case study, "Societal LCA" case study, "Societal Life Cycle Assessment" case study, Societal Life Cycle Assessment case study, Social Life Cycle Assessment case study. The papers not pertinent to our research work and papers that were not S-LCA cases studies (including case studies in which social impacts are assessed, but not with the S-LCA methodology) were excluded. At the end of this first phase, 35 case studies were considered as relevant. A Summary Table was prepared to summarise them for the identification of the main trends.

3. Results and Discussion

Critical review

Using the keyword "case study" to perform the research, proved to be insufficient since most case studies are integrated in theoretical papers as an application or appendix.

Within the 35 case studies considered, apart from examining their goals, the following were identified: 4 papers on energy sources (3 on biofuels and 1 on diesel and petrol), 7 on Information and Communication Technologies, 7 on the agri-food sector and 5 on waste management. The remaining 12 papers can be classified as "Others" because of the diversity of the topics covered.

The analysis of the 35 identified papers showed that approximately 71% (25 of 35) of these were conducted in accordance with the UNEP/SETAC Guidelines, thus confirming the fact that these have had an essential influence (leverage) on the S-LCA research field.

Main methodological issues

Here some of the methodological matters described in ISO 14040 were analysed: Functional Unit (FU), System Boundary and Impact Assessment (IA) methods. Only 34% of the papers analysed took into consideration a numerical FU, whereas 51% considered a non-numerical FU (of the latter only 14% specified the reference flow). The remaining 14% did not state any FU (Figure 1).

Regarding the System Boundary, 40% of the analysed studies (Figure 1) considered the entire life cycle from “cradle to grave”, 20% of these assessed the life cycle of the product from “cradle to gate” while the 26% assessed it from “gate to gate” (e.g. between banana plantations and the port in Feschet et al. 2013). 9% of the authors did not specify the System Boundary considered in their work. Two papers were categorised as “Other” because of the particularity of the System Boundary considered: Macombe et al. 2013 considered “the national economy” and Paragahawewa et al. 2009 affirmed that “it is appropriate to focus on all socially significant impacts from both company and production specific activities as per ISO 14044 requirements for E-LCA”.

Regarding the IA phase, 68% of the analysed papers used an IA method in the field of the so-called Taskforce approach, 6% used DALY (Disability-Adjusted Life Year), 6% the Pathways approach, two papers (6% of the total) did not implement any IA and other two did not specify the IA method used. Three papers (8%) were included in the category “Other” in virtue of the peculiarities of the method used (Figure 1).

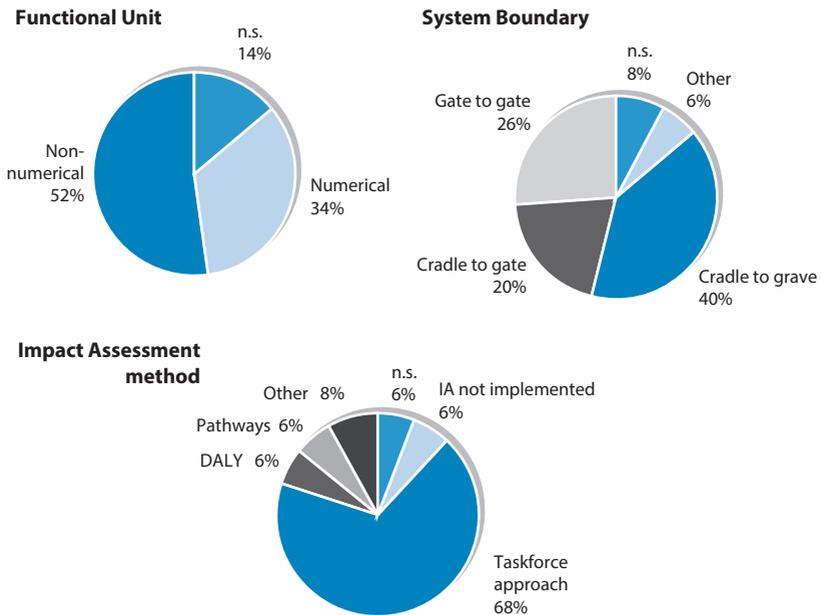


Figure 1: Percentage breakdown of the analysed papers according to the Functional Unit, System Boundary Impact Assessment method considered.

The tendency to propose different IA methods, by many authors, perhaps reveals a weakness in the methodology. In fact, in UNEP/SETAC Guidelines (2009) the impact assessment methodologies are considered as an open field and further developments of IA methods are greatly needed. To fill this gap an attempt was done by publishing a Handbook on Product Social Impact Assessment by Prè Sustainability in September 2014 (Roundtable for Product Social Metrics 2014).

Impact indicators

As regards the impact indicators, crucial to assess the various social issues of concern (subcategories), these are not specified in 10 out of 35 case studies (about 30% of the total).

The most considered stakeholder category is “Workers” (100%, i.e. 30 of 35 papers that explicitly took into account the stakeholder categories). This could mean that workers are considered by the authors, as the most impacted stakeholder category from a social point of view. The analysis of the papers has shown that some authors use, among social indicators, those elements that help to better characterise the context in which a company operates (although these are not present in the Guidelines). These elements are the characteristic indicators of a given sector which would have little meaning if considered within a different context. There are however, other indicators present in the Guidelines, but are considered less apt to the specific case study developed and therefore not taken into account.

Positive social impacts

In the already published literature regarding the analysis of positive impacts in S-LCA, references to this topic include: in Sanchez Ramirez et al. (2014, p.1515) the authors state that “(S-LCA) [...] enables us to assess the behaviour of organizations and to gain a better understanding of this behaviour and its development in relation to the various stakeholders.”. Furthermore, on page 50, the UNEP/SETAC Guidelines state that “[t]he ultimate objective for conducting a S-LCA 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. Achievement of minimum benchmarks or thresholds of performance is recognized by the methods, but so are positive impacts that go beyond compliance”. In these statements the growing attention attributed to positive social impacts is highlighted.

In more recent years, the theme of positive social impacts has been dealt with by authors such as Norris (2006) and Ekener-Petersen (2013). In the first paper, the author refers to “health impacts” (both positive and negative), introducing the concept of positive social impacts, although not having been examined in depth. The paper by Ekener-Petersen (2013, 12) aims “to examine different ways in which the methodology can be applied and to study methodologies for adopting an ethical perspective on how social impacts are distributed among stakeholders”, through the analysis of three

case studies and by taking into account both negative and positive impacts, therefore giving importance to the role of positive impacts. Norris (n.d.) also developed a new approach (called “Handprint accounting”) in which positive impacts can be directly compared with (and subtracted from) the negative ones.

The analysis of the papers shows that 37% of the case studies (13 of 35) do not explicitly identify any positive impact. The remaining 63% was divided per industrial sectors, as shown in Figure 2.

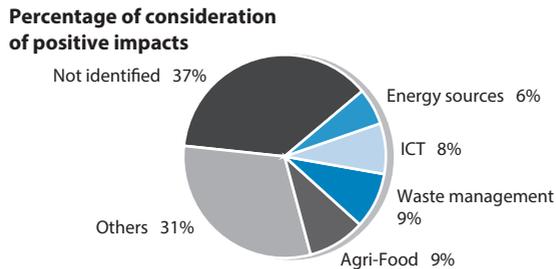


Figure 2: Percentage breakdown of the analysed papers according to the consideration of positive social impacts.

The analysis carried out showed that the utility of goods is identified as a positive impact in two papers (Baumann et al. 2013, Ekener-Petersen and Moberg 2013). The utility, in the economic language, is defined as the well-being that a given good or service is able to provide to a person as it is suitable to satisfy a desire or fulfil a need (Treccani 2012). It appears, therefore, somehow significant to consider the utility performed by the good during its use phase as a positive impact.

The concept of positive impacts, however, does not refer merely to the utility (benefit from its use), but in a broader sense, to the so called «win-win» situations¹, in which solutions that improve the condition of various stakeholders involved are identified.

In the paper Traverso et al. (2012) “all benefits (wage, holiday, undetermined contracts and so on) are considered as positive impacts”. This seems quite odd, as the case study focuses on Germany and Italy as a Geographical Area, where such benefits are provided by appropriate laws to protect workers. Therefore, this type of claim is also in contradiction with the definition of a positive impact (performance that go beyond compliance) given by the Guidelines.

¹ A win-win situation is defined as a situation in which all parties involved in the initiative have a benefit in terms of value created in their favour (Molteni 2007).

Another interesting consideration regarding positive impacts is made in the paper of Vinyes et al. (2013), where it is declared that “[n]egative indicators are those whose high values have a negative contribution to sustainability (economic and environmental indicators) and positive indicators are those that have a positive contribution to sustainability (social indicators)”.

Some other remarks on social impacts (positive and negative) can be done: a noteworthy feature of social impacts is that they produce their effect as soon as there are changes in social conditions. Moreover, it is not only the stakeholders who are subject to these impacts, but they also provoke an active response, implying a certain degree of dynamism. For this reason, they are difficult to identify and are situation/site-specific (Slootweg et al. 2001). They refer, in addition, to both quantitative variables (demographic and economic) and to changes in values, belief system and in the perception of the context in which they are being produced (Lahtinen et al. 2014).

An example of context-related positive impacts is given in the paper of Jørgensen et al. (2010), in which the authors highlight that child labour can be regarded as a positive impact in some situations. These could include: helping children to develop discipline, responsibility, self-confidence and independence, teaching them how to manage money, and providing them with working skills.

Questionnaires

With regard to the questionnaire sent to those authors of the case studies as well as to a number of experts in the S-LCA field, 13 were answered out of the 50 questionnaires sent.

Starting from the responses collected until now, some preliminary conclusions can be drawn. One of the first problems in dealing with positive impacts is found in the definitional phase. Indeed, the authors surveyed showed less agreement in providing a definition of positive social impact: these definitions are almost perfectly divided between: “The net positive effect of an activity on a community and the well-being of individuals and families” and “An improvement related to the previous situation”. This situation is also due to the subjectivity of the issue itself. It must be emphasised however that a positive impact is not the absence of a negative one.

After having analysed the questionnaires collected until now, it appears vague to define a positive impact generically as an improvement, because the beneficiary and its time duration are not specified. It is important to underline instead who is the subject of the improvement and who acknowledges it: if it is a top-down improvement it can concern several stakeholder categories, but it may fail to record important changes that occur at the local level (Lahtinen et al. 2014).

Regarding the necessity, or not, to set new Subcategories, the authors interviewed are in disagreement, as well: i) there is a part of those who claim that new Subcategories should be set; ii) another share which could not say if this is necessary or deemed

necessary only in cases where it applies a specific IA method; iii) most believe that the existing Subcategories are enough. The definition of new Subcategories would not be, indeed, the good way to identify social impacts, but it would be more interesting to find social impacts in the literature on social science. It is therefore not necessary to set new subcategories if the relationship (pathway) to assess social impacts is not identified.

Positive social impacts, in the opinion of the authors, can be regarded as a subjective, context-related issue and have to be assessed as in the case of negative ones (the same category of indicator can display a positive or a negative impact, it depends on the previous situation that is set to be the reference).

4. Conclusions

The concept of positive impacts has arisen in the field of Social Impact Assessment (SIA). Indeed, after having performed a literature review and analysed a set of papers, no shared definition of positive social impacts as part of the S-LCA methodology could be deducted. It will be therefore necessary in the future to put it to debate amongst researchers. As a result of the questionnaires, it should be noted that the unanimity of the authors believe that research in the context of positive impacts is useful for the general advancement on social impacts.

In the framework of social positive impacts meant as “win-win” situations, helping communities (and other stakeholders) to identify development objectives and ensuring that positive results are maximised, may be more important than minimising the damage originating from negative impacts. Generally speaking, positive outcomes should be the focus of the development (e.g. capacity building, empowerment, realization of human and social potential).

As far as indicators are concerned, it can be highlighted that positive impacts can be among the main driving forces towards sustainable development; therefore, it is hoped that future work will examine the role of indicators in S-LCA.

As only preliminary results are reported here, more research needs to be performed to continue the ongoing work through the collection of questionnaires filled in by experts in the S-LCA field.

Future research developments may concern identifying social evaluation criteria to establish what is to be considered as “positive” and examining in depth the context (for example: in what way could the context evolve after a change occurred that led to an improvement?).

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