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Social impacts and life cycle assessment: proposals for methodological development for SMEs in the European food and drink sector.

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Abstract

Purpose: SMEs account for 99 per cent of companies operating in the European food and drink industry and, often, are part of highly fragmented and complex food chains. The article focuses on the development of a social impact assessment methodology for SMEs in selected food and drink products as part of the EU-FP7 *SENSE* research project. The proposed methodology employs a top-down and bottom-up approach and focuses on labour rights/working conditions along the product supply chain as the key social impact indicator, limiting key stakeholder classification to workers/employees and local communities impacted by the production process. Problems related to this emerging field are discussed and questions for further research are expounded.

Methods: The article reviews both academic and 'grey' literature on life cycle assessment (LCA) and its relationship to S-LCA and SMEs at the beginning of 2013 and includes case study evidence from the food sector. A pilot questionnaire survey sent to European food and drink sector SMEs and trade associations (as partners in the research project) about their knowledge, experience and engagement with social impacts is presented. Proposals are elaborated for a social impact assessment methodology that identifies the key data for SMEs to collect.

Results and discussion: The literature reveals the complexity of the S-LCA approach as it aims to unite disparate and often conflicting interests. Findings from the pilot questionnaire are discussed. Using a top-down and bottom-up approach, the proposed methodology assesses data from SMEs along the supply chain in order to gauge social improvements in the management of labour-related issues for different product sectors. Issues relating to the 'attributional' choice of social impact indicator and key stakeholder categories are discussed. How 'scoring' is interpreted and reported, and what the intended effect of its use will be are also elaborated upon.

Conclusions: Whilst recognising the difficulty of devising a robust social impact assessment for SMEs in the food and drink sector, it is argued that the proposed methodology makes a useful contribution in this fast emerging field.

Key words: S-LCA . food and drink sector . SMEs . social impacts . methodologies. life cycle assessment. Europe

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1. Introduction

Public awareness and campaigning activity about social impacts linked to product life cycles and company responsibilities are increasing, including demand for more ecological and ethical standards when selecting food and drink (e.g. fair trade labelling; followthethings.com). The article describes how up-to-date thinking and methodological development on social life cycle assessment (S-LCA), and its relationship with environmental LCA (E-LCA), was reviewed in order to devise a social impact assessment methodology. This work investigated the feasibility of combining key social impacts alongside an existing set of key environmental impacts or indicators of a range of specific food and drink product areas (salmon farmed fish; orange fruit juice; meat and dairy) to be used by small and medium sized enterprises (SMEs). The data required to measure the social and the environmental impacts of these products is entered into a software tool by the food and drink SMEs themselves. The challenge was to develop a suitable methodology to allow social impacts to be measured alongside the environmental impacts, the results of which are the focus of this paper. This work forms part of the EU-FP7 *SENSE* project¹.

2. Materials and methods

The article first reviews academic and ‘grey’ literature on S-LCA at the beginning of 2013. Key issues are identified, discussed, developed and then drawn on to help develop a social impact assessment methodology for trialling with SMEs in the food and drink sector. These findings were probed further by devising and analysing responses to a pilot questionnaire sent to a small selection of SMEs and trade associations (as partners in the *SENSE* project). Based on the review and questionnaire survey findings, proposals for a social impact assessment methodology for SMEs are elaborated and issues concerning its applicability are discussed; there follows concluding remarks about future research needs.

¹ *SENSE* (<http://www.senseproject.eu/> Accessed 8 November 2013) focuses on European small and medium enterprises (SMEs) and aims to deliver a harmonised system for the environmental impact assessment of food and drink products – to be presented as a self-administered data entry software tool. In order to identify what categories of data are to be used, the project is evaluating existing relevant environmental impact assessment methodologies to identify key environmental performance indicators (KEPIs) and is also considering social and socio-economic impacts.

3. Developing the methodology

3.1 Current methodological developments for S-LCA: SMEs and the food and drink sector

Research developments and methodologies for integrating social (and socio-economic) impacts into LCA suggest that no single line of investigation or agreed approach has emerged to date and the review process brings some specific issues to the fore. For example, although S-LCA follows the same procedural steps as an environmental (E-)LCA i.e. a goal and scope definition, inventory analysis, impact assessment and interpretation, there are clear differences between environmental impacts that are related to *process*, and social impacts that tend to be related to the *conduct* of the company carrying out the process. This includes the fact that social impacts do not have quantifiable ‘zero’ targets, in contrast to those associated with environmental emissions or impacts on resources (Dreyer et al 2006; Jorgensen 2012).

Current debates about life cycle sustainability assessment (LCSA), that combines S-LCA with LCA and Life Cycle Costing (LCC), also raise issues about system boundaries and whether these are/can be identical or should be constructed as separate analyses (Klopffer 2003; Griesshammer et al 2006; Valdivia et al 2011; Parent et al 2012). This review underlines the need for agreement over which social impacts (both indicator and stakeholder categories) are the most relevant to include if social impact assessment methodologies are to capture impact transfers along the product life cycle that are *intrinsic* to the value of the product (Benoit & Mazijn 2009; Parent et al 2012) and unite disparate and often conflicting interests for the various actors and stakeholders implicated in the chain (Macombe et al 2011; Jorgensen 2012). In common with other sectors, the development of an LCA methodology that integrates social impacts in the food chain needs to take account of the large numbers of agents involved and the complexity posed by national and/or regional differences. It is also noted that although most agricultural *commodity* sustainability roundtables are applying LCA approaches, many *businesses* continue to use corporate and supply chain-focused metrics; sector specific guidance can be very different between the two approaches depending on the circumstances (Kissinger 2012; see also De Camillis et al (2012) on the new ENVIFOOD protocol and the European Sustainable Production and Consumption Roundtable at <http://www.food-scp.eu>). These methodological differences are compounded for SMEs, where awareness of life cycle assessment and in particular, of social impacts in the product life cycle are low. Furthermore, SMEs interest and, more importantly,

their ability to address such impacts is also compromised by their size and scale of resources, as may be their ability to get data beyond first up- or down-stream tiers in the product supply chain.

Jorgensen et al (2012) suggest that S-LCA methodological development should provide clarity about: what the S-LCA aims to support; who the user is; and what the intended effect of its use will be. They argue that the usefulness of S-LCA depends on its ability to solve or mitigate a problem(s) and improve the social conditions for stakeholders implicated in the product life cycle. For S-LCA to gain credibility as a decision support tool there is not only a need for agreement over which impacts are the most relevant to include in the assessment, but also that these impacts can be formulated as credible options for action using the evaluation process (Griesshammer et al 2006). Within this debate, many draw attention to *existing* schemes of social impact assessment in supply chain management that attempt to tackle social upgrading and decent work by addressing the relationship between product and process standards and the outcomes for those engaged within the chains, including impacts in local communities (Barrientos et al 2008; OECD 2009; Jorgensen 2010; Henriques 2012).

Findings from the review process, therefore, identified two fundamental issues that the methodology needed to address, namely: i.) the role/use of social impact assessment and its relationship with other social impact interventions; and ii.) how to resolve both the complex relationship and issues of complementarity between environmental and social impacts in LCA development. Focusing on the needs of the *SENSE* tool and its applicability for SMEs in the food and drink sector, these two issues are now considered and discussed.

3.2 Methodology: goal and scope definition

Drawing on this knowledge and experience, and an understanding of the limited resources available to SMEs, a decision was taken to concentrate on labour rights and working conditions as the key social impact indicator because this provided clarity, based on existing evidence and data collection, on what the assessment aimed to support. A *separate* system boundary to environmental impact assessment was proposed, defined using those parts of the life cycle that the company performing the assessment could influence directly (Reitingier et al 2011), and where demonstrable social improvements could be made with regard to labour-related issues. In addition, given the restrictions posed on data collection for SMEs, the intended effect of the social impact methodology was sharpened by classifying the key

stakeholder groups as workers/employees and local communities impacted by the product life cycle. Assessment was thus proposed at mid-point level by *internal* decision-makers (i.e. Managers, or their SME equivalent, are the *user*) as evidence suggests that mid-point indicators are more understandable (and more likely to be implemented by SMEs) because they are closer to the managers/ SME equivalents' own experience than end goals (Jorgensen 2010).

In order to take the proposal beyond Corporate Social Responsibility (CSR), this methodological development also proposes two specific features. The *first feature* is a hybrid *top-down and bottom-up* approach, where generic data (designed to take into account the location, sector, scale and ownership of a company) is combined for assessment with site-specific data (to provide accuracy and inform decision-making). This proposal is based on case study evidence from product life cycles for relevant food sectors, including Kruse et al (2009) methodology to identify socio-economic indicators in the salmon production cycle that combines (quantifiable) and descriptive *general* indicators (ILO standards, UN Global Compact, ISOs etc.) with descriptive *specific* indicators that are product or process specific; and Benoît et al (2012) social scoping model that uses social impacts to identify 'hotspots' in the orange juice supply chain. The *second feature* of the methodology is the proposal to gather data from a range of SMEs at key production points along the food and drink product life cycle. It is argued that this facility to include up-stream and down-stream effects by assessing SMEs at various stages along the production chain will help provide a better understanding of the full product life cycle in a social perspective.

With very limited case study evidence, proposing a mechanism that interprets the results for the evaluation process is more difficult. In this early stage of development, a benchmark (data from the last financial year) is proposed to enable SMEs to gauge improvements in their management of labour-related issues in their product life cycle; this is elaborated in the next section.

3.3 Social impact assessment for SMEs in the food and drink sector

To probe the feasibility of this emerging social impact assessment methodology, a pilot questionnaire (see Section 2) was constructed and sent to SMEs and trade associations and relevant project partners (13 in total). This was an exploratory exercise that aimed to find out whether the proposed social impact indicator (labour rights/working conditions) and related key stakeholder categories (workers/employees and local communities impacted by the product life cycle) would work

successfully in the assessment method. To fulfil the goal of the study, the questionnaire was sent to relevant representatives within the partner SMEs and trade associations. The majority of questions were devised with multiple-choice tick box answers but, where relevant, additional text boxes enabled respondents to explain or expand their answers. Four questionnaires were returned (from the various SME and trade associations) and feedback was also received from other project partners. Feedback was also requested on whether the questions could be assessed using data that was either reasonably easy to access, or was already being collected as part of SMEs regular monitoring systems (for example, as part of CSR reporting if they were part of large corporate supply chains). In addition, opinions were sought about whether this data could provide a benchmark to monitor social improvements in the product life cycle and sustainable performance of SMEs.

The scope focused on three key aspects of the SME product life cycle: i.) pay and conditions for key SME workers/employees, including number of hours worked, pay rates, benefits, training etc. Questions were specific to the *largest* category of workers employed by the SME, i.e. the category of worker employed for the greatest number of hours per week in the previous financial year. This was based on the assumption that these workers are likely to be on the lowest pay and conditions and are thus a good benchmark for company improvement; ii.) SMEs' knowledge of working conditions along their product(ion) supply chains; this included questions that both asked for country-specific data in order to identify 'hotspots', their knowledge of sector-specific standards or guidelines, and their relationships with large corporations. It also asked for the *name* of a senior manager/SME equivalent with responsibility for labour standards within the company; and iii.) focused on the positive (and negative) impacts that SME production activities may have on workers/employees and their local communities and how the company engaged with these issues.

Analysis of the data revealed that respondents had some commitment to improving social impacts in their product(ion) life cycles, suggesting that it is feasible to incorporate labour-related social impacts in the *SENSE* tool (2 respondents ticked YES in the feedback box for including product-level social impacts; 2 ticked NO, but one indicated they were planning to address this in the future). However, the pilot was *very* small and only sent to *SENSE* project partners with some commitment to the aims of the project. None of the respondents provided the *name* of a senior manager/SME equivalent with *responsibility* for labour standards within the company. One reason could be that the size of SME meant this was not applicable. However, as evidence suggests that the involvement and

commitment of senior personnel is critical for positive change in labour-related issues (Barrientos et al, 2008; Fox & Vorley, 2002), it is suggested that the methodology should incorporate this requirement. In addition, the analysis did not provide any conclusive evidence of SME knowledge beyond first-tier suppliers. This suggests that SMEs may not have the time, motivation or resources to identify, for example, country-specific sources for imported raw materials/products where potential ‘hotspots’ may occur. However, analysis of responses to questions on local communities shows this is something that some SMEs are already committed to; for example, through support for local training/ education programmes and initiatives and positive local procurement strategies. Thus, the pilot questionnaire trialled the goal, scope and inventory analyses of the proposed methodology for SMEs; the next section makes proposals for impact assessment and interpretation.

3.4 Proposals for assessment and interpretation

The methodology is based on the premise of breaking the product supply chain into blocks with various SMEs completing the self-administered software tool at each level of activity along the chain. *Table 1* provides a brief summary of how the social impact methodology could be constructed using the top-down and bottom-up approach. In the top-down section, a key question asks for the *name* of the senior manager /board member (or equivalent) with responsibility for labour-related issues to ensure the involvement and commitment of senior personnel. ILO core labour standards² are proposed as the basis for assessment, combined with awareness (and management/monitoring) of sector-specific standards/codes/guidelines. For the bottom-up approach, identifying the largest category of worker (by total number of hours worked each week) is a key criterion. Sector-specific questions are then posed that relate to: employment conditions (written), working hours, wages and health and safety conditions as core labour standards (see Ethical Trading Initiative (ETI) base code³). Questions also reflect the existence of sector specific codes and guidelines with regard to social and economic sustainability and draw on existing inspection and certification schemes. This is designed to account for the various economic, social and cultural conditions in different countries - as is already reflected in existing sector

² Information on ILO core labour standards can be found at: <http://www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang--en/index.htm> [accessed 8 November 2013]

³ Full details of the ETI base code can be found at: <http://www.ethicaltrade.org/resources/key-eti-resources/eti-base-code> [accessed 8 November 2013]

guidelines (see for example, fruit juice - SGF/IRMA Code of Conduct⁴ and ASC, 2012; Standards for Responsible Salmon Aquaculture, 2012). In order that the proposed methodology identifies common factors for all food sector SMEs *and* addresses industry specific impacts, it is important that ‘tools’/supporting documentation are made available for those filling in the assessment that explain the *sector* standards/guidelines, alongside national laws, local and industrial regulations and ILO standards etc. For example, the SHDB has social theme tables and UNEP/SETAC have produced methodological sheets (Benoît-Norris et al 2011b). These are important factors to consider because, as has been widely noted, limitations of time, funds or data access could lead those reporting for companies to take short-cuts, exclude processes and provide incomplete data which will lead to inaccurate results.

Table 1: Top-down and bottom-up approach: proposed social impact assessment methodology (source: authors)

Top down approach	Monitoring/management systems
Named senior manager/board member/ company equivalent: with responsibility for labour-related issues, including supply chain operations.	Role and responsibilities are laid out as part of job description.
ILO core labour standards: Freedom of association/collective bargaining; no forced labour; no child labour; and equal opportunities. AND/OR Sector standards /codes and guidelines (where these exist)	Awareness of core labour standards; communicated at least within company; may extend to first tier suppliers and beyond. Can provide evidence of managing/monitoring. AND/OR awareness of sector specific standards/codes; communicated within company/to first tier suppliers, with evidence of managing/monitoring.
Bottom-up approach	
Largest category of worker employed (by total nos. hours worked each week) – specific to each sector	Can identify this category of worker using data from last financial year.
Written employment conditions	Systems in place to ensure workers receive written information about their employment conditions and wages they will receive.
Working hours	Systems in place to ensure working hours comply with national laws, and that workers are not required to work in excess of 48 hours per week on a regular basis.
Wages	Systems in place to ensure wages and benefits paid meet, at a minimum, national legal standards or industry benchmark standards.

⁴ Full details of the SGF/IRMA CoC at: <http://www.sgf.org/en/home/fks/nachhaltige-produkte/> [accessed 8 November 2013]

Health and safety	Systems in place to ensure working conditions are safe and hygienic. Training is in place and is regularly monitored by a senior manager.
Local communities	Can demonstrate evidence of positive measures that address 'external costs' in local communities affected by production processes and activities.

NB. adapted ETI base code was used to construct some of the text for monitoring/management systems for bottom-up approach.

The weighting between top-down and bottom-up is equal and it is suggested that the scoring mechanism should establish a starting point for continuous improvement over time using baseline data from the last financial year, updated each new financial year. The scoring would provide a 'rating' for each SME using the categories:

- **No evidence:** SME provides no evidence (*Baseline*);
- **Awareness:** SME demonstrates awareness of core labour standards and/or sector code or guidelines **and** of the external costs of their activities in local communities impacted by their product(ion) life cycle but management of employment practices and actions taken are limited;
- **Managing:** SME has a named senior representative with responsibility for labour standards within the company **and** has adopted policies to manage labour standards and working conditions on-site, **and** demonstrates evidence of actions taken to address external costs of their product(ion) life cycle within local communities;
- **Good practice:** SME has a named senior representative with responsibility for labour standards within the company **and** has policies on labour standards and working conditions in place, **and** has a formal management system on-site, **and** its policies are communicated at least as far as first-tier suppliers, **and** demonstrates evidence of actions taken to address external costs of their product(ion) life cycle within local communities;
- **Best practice:** SME has a named senior representative with responsibility for labour standards within the company **and** has a good management systems for labour standards and working conditions in place at least as far as first-tier suppliers, **and** demonstrates evidence of actions taken to address external costs of their product(ion) life cycle within local communities, **and** makes public statements of commitment (e.g. on web-site/labelling).

Thus, to make the rating system more robust, the self-administered questionnaire asks for *evidence* of how the SME is managing, implementing and reporting its policies and practices on labour standards/working conditions and how this effects workers/employees and local communities impacted by its production activities. By doing so, each SME has the opportunity to *move up the rating scale, according to its level of engagement*. Assessment 'scores' for SMEs *at key levels* of the product supply chain would be analysed to provide an iterative process that aims to capture *impact transfers at key points along* the products' life cycle. Analysis of data from individual SMEs will provide a category rating for each section of the supply chain assessed and an overall rating for the sector. However, it is noted that this model is still at an exploratory stage of development within the project and the proposed methodology has limitations; some of these are discussed further in Section 4.

4. Discussion

The discussion returns to the critical issues of: what the social impact assessment aims to support; who the user is and what the intended effect of its use will be. Following what Jorgensen et al (2012) refer to as the *lead firm* S-LCA, the reporting for this proposed methodology falls *internally* within the company, and assessment aims to improve social impacts within the *existing* SME supply chain. In this way, it is proposed that the social impact assessment tool will go beyond 'normal' CSR reporting tools and initiatives that focus on the individual company by using these various company-based processes as a proxy measurement for a product-based calculation. It is accepted, however, that this type of assessment is fundamentally subjective and an iterative process. In addition, although it is also acknowledged that self-reporting can be questioned for its value and reliability, it is argued that by developing the tool in this way will help ensure that if one SME chooses to 'overlook' principal social impacts (i.e. 'hotspots') these are picked up elsewhere in data-gathering, either from other SMEs in the same part of the production chain or up-/down-stream using data from other SMEs in the life cycle assessment process. Furthermore, companies are recognising their social responsibilities more formally by engaging in this activity. However, some issues concerning the intended effect of implementing the methodology remain unresolved and there is a need to be mindful of how the magnitude (scoring) of the social impacts is interpreted and reported, for example, with regard to how/whether normalization is feasible; this needs further discussion and clarification.

5. Conclusions

It is recognised that there are few S-LCA case studies and that data availability is a major problem as is the lack of proven effect of using S-LCA for decision support (Jorgensen 2012). It is also acknowledged that adapting life cycle assessment for small-scale businesses in the food and drink sector magnifies these issues. However, for SMEs to engage in a meaningful way with social impact assessment, it is imperative that they can practically manage data requirements that are tailored to non-industrial food production processes; that is, the efficacy of 'translating' normative values into quantifiable assessments (Freidberg 2009). Successful engagement of SMEs in social impact assessment could not only provide more transparency in the product supply chain for the consumer, help facilitate implementation of public policies and sector standards, promote local procurement and also present opportunities for competitive advantage as larger companies pay more attention to improving the social sustainability elements of their product offerings. It is suggested that by

developing a *more narrowly defined* social impact assessment methodology - i.e. using one key social performance indicator - could make its implementation more practicable for SMEs in these early stages of methodological development and that these proposals make a further, useful contribution to this important emerging field and, in particular, to its application for SMEs as a vital part of the food and drink production sector.

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