Using the Materiality Assessment and PSILCA database to identify and assess the Social and Governance issues for stakeholders along the value chain of new bio-based materials

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Introduction

The three research projects are part of EU funded research that aims to develop new bio-based products and processes for the New Bioeconomy in Europe. As part of these projects, the potential social impacts of the products and processes were evaluated along the value chain. The NeoCel project aims to develop new textile processes based on forest biomass (NeoCel, 2019). The SaltGae project aims to develop new algae-based process for saline wastewater treatment (SaltGae, 2019). The KaRMA2020 project aims to develop new value chains for bio-based waste like feathers (KaRMA2020 2019).

The goal of this work is to use S-LCA in early process development and value chain creation. Social LCA was used to answer stakeholders' questions on potential social risks in the value chain of NeoCel, SaltGae and KaRMA2020.

The social life cycle assessment (S-LCA) methodology and PSILCA database was chosen to analyse these social risks and compare them to products on the market. Similar research questions for the three cases are regarding the hot spots of social impacts along the value chain in Europe and comparison with competitors like in China, as for the textile value chain.

Method

Social LCA is a method to assess and the social impacts of products and services (UNEP 2009). It is important to select and reduce the number of social indicators in S-LCA studies. Product social impact life cycle assessment (PSILCA 2015) covers 54 qualitative & quantitative indicators, 16 subcategories, and 15 000 industrial sectors and commodities. In order to select indicators, the Handbook for Product Social Impact Assessment (HPSIA, 2018) recommends the used of Materiality Assessment (MAT), already used on CSR work in companies.

The **Materiality Assessment** (MAT) is a tool for companies to identify and assess potential Environmental, **Social** and Governance (ESG) issues that could **impact** the business and its **stakeholders**. The **assessment** allows companies to inform company strategy, targets and reporting (CSR, 2019).

In this paper we present the results from using MAT and PSILCA when choosing social indicators and give some reflections on how stakeholders in the value chain understand the results of SLCA and how they are presented, for example the use of risk hours.

Results and discussion

The results build on previous S-LCA studies on Mobile Biorefineries (Brunklaus et al 2018) and D-Factory (Peñaloza et al 2018). These helped to choose and load the PSILCA database for the indicators in KaRMA2020. The other two, NeoCel and SaltGae, are based on materiality assessment for the processes as well as the locations they took place (Italy, Israel, Sweden).

The materiality assessment was performed based on the GRI guidelines (GRI 2016). Four stakeholders were identified with a stronger insight on what is considered materiality in the forestry industry. These included: The Nordic Council of Ministers, The Confederation of European Paper Industries, Swedbank Sector Guidelines for CSR in Forestry, and a research publication on social indicators for LCA of forest products. The number of times the social topics/indicators appeared in stakeholder reports was recorded and analysed in a materiality graph (Fig 1). For example, the 'accident rate at the workplace' was mentioned in almost all reports, and this indicator can be highly influenced within the production of fibers. The blue-highlighted bubbles were the relevant indicators identified and applied in the PSICA database.

The materiality assessment was used to identify the most relevant social indicators for the stakeholders and for the process design of the new value chain. Since the time of the SLCA was limited in scope, only a select number of relevant indicators were chosen based on the materiality assessment. The results are presented as materiality of stakeholder (Fig 1, x-value) and process influence (Fig 1, y-value), see the example graph below for NeoCel.

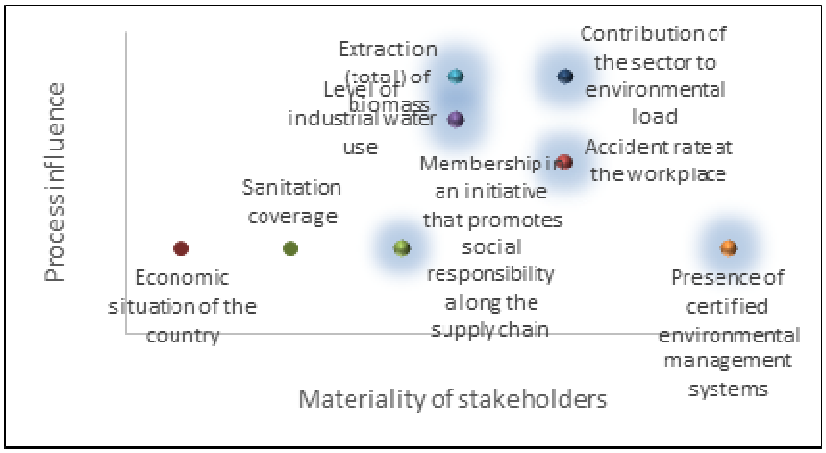

Figure 1: Materiality assessment for the case of NeoCel.

The materiality assessment results for the case of NeoCel include the following social indicators: Non-fatal accidents, Social responsibility, Industrial water, Biomass consumption, certified EMS, Contribution to environmental load. The results for the case of SaltGae include DALYs, Fatal accidents, Non-fatal accidents, Safety measures, and Industrial water depletion). The results for the case of KaRMA2020 include The Risk of DALYs due to pollution and the contribution to economic development. The benefits of having the material assessment lies in finding relevant social indicators for stakeholder with an interest in the forestry industry.

The PSILCA database was used to assess the social impacts and govern the value chain of new bio-based materials. The S-LCA results and the use of medium risk hours equivalents has been discussed by stakeholders in the three research projects. Recently, the use of scoring in social LCA also has also been discussed scientifically (Arvidsson 2019). Based on the feedback from the stakeholders in the three research projects, it was difficult to understand the scoring of social impacts in from of medium risk hours and subsequently to use the assessment for value chain creation. This might be due to the fact that S-LCA are not performed on its own and include mostly also an E-LCA. While the results and the scores of an E-LCA are understood by stakeholder, the results of an S-LCA might be more difficult to gasp. Therefore, good care should be taken when communicating results since social LCA is a rather unknown tool and the PSILCA database is one of several social hotspot databases to be used in social LCA.

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