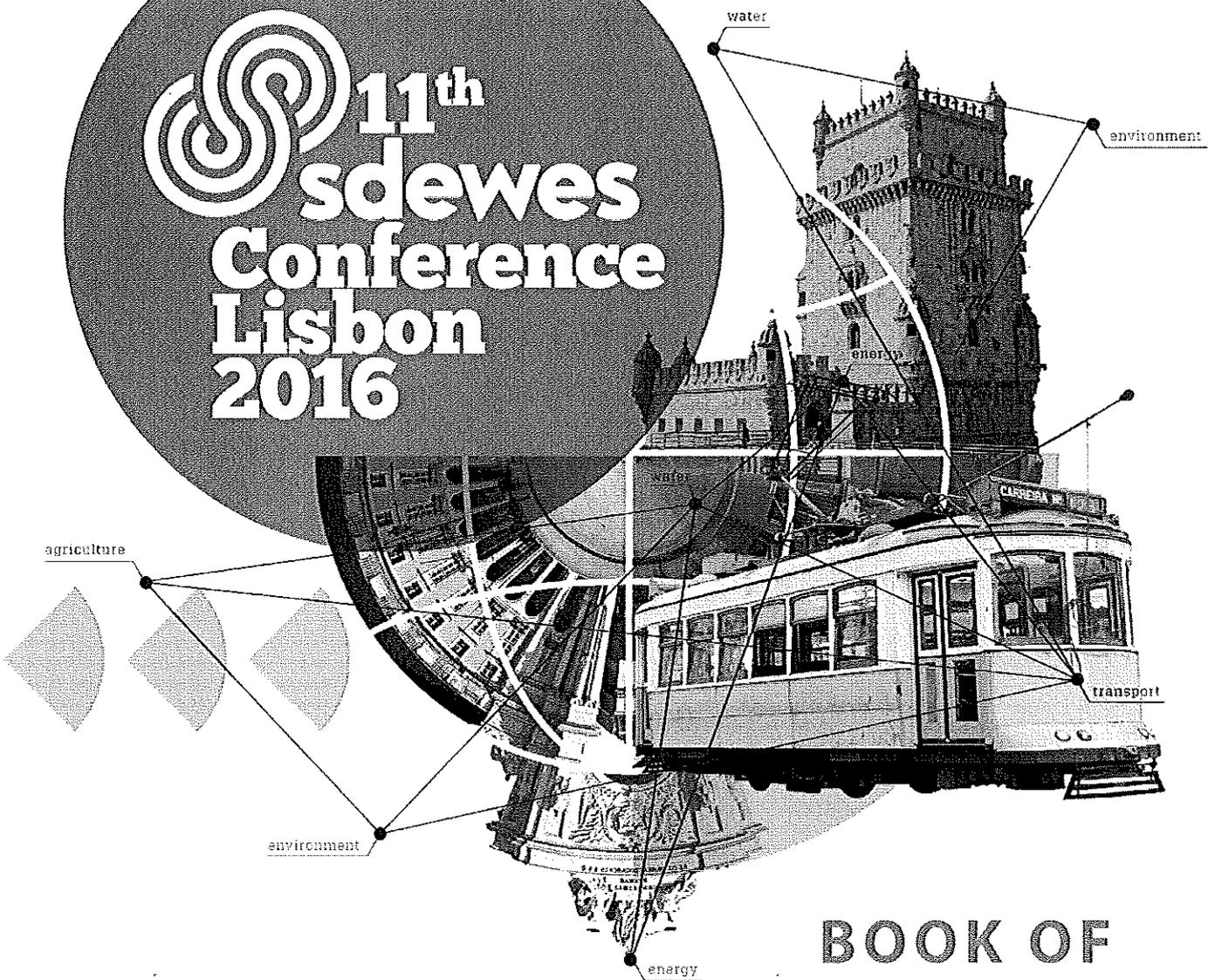


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INTERNATIONAL CENTRE FOR SUSTAINABLE DEVELOPMENT  
OF ENERGY, WATER AND ENVIRONMENT SYSTEMS

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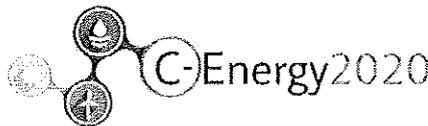
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## SDEWES2016.0049 Social Life Cycle Assessment in Bio-Based Industries: Identifying Main Indicators and Impacts

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### Abstract

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Assessing social impacts of various products, services and human activities has achieved an increasing interest worldwide. The nature of sustainability of biobased industries from a social point of view is how and to what extent they are perceived by society, and how various societies take advantages from such activities. However, an important issue is that social factors are not usually easy to be quantitatively analyzed and although the social impacts might be very remarkable, especially at the local scale, they have been not possible to be investigated in the majority of impact evaluations in the past. Despite the existence of many different methodologies towards Social Life Cycle Assessment (SLCA) to address social impacts of various businesses and industries, most of them impartially address social performances of an industry. The aim of this paper is to highlight the main criteria that need to be taken into account in SLCA approaches for identifying the social indicators and impacts of biobased industries that is a timely topic worldwide toward climate change mitigation goals. Accordingly, considering the general approach of SLCA and particularly its inventory analysis phase for impact categories and indicator determinations, the paper provides an overview of the existing guidelines and frameworks for identifying social indicators and impact categories associated with bio-industries. In conclusion, main impact categories and indicators formulated in the existing frameworks applied to biobased industries are demonstrated as a basic set of applicable elements of social dimensions in evaluating bio-industries' sustainability when conducting SLCA. The state of the art for this study mainly includes leading journal articles, international reports and conference papers up to and including 2016 on SLCA in biobased industries. According to the reviewed frameworks in this study, quantitative, midpoint and site-specific data are the main elements taken into account when collecting the data for biobased product social impact assessment. This study also reveals that although SLCA is in its early steps of development and despite in numerous cases, conducting a comprehensive SLCA is not yet feasible, it has been considered to have substantially promising methodological attributes that can help policymakers and other stakeholders to quantify and assess sustainability of bio-industries from the social perspective. Recommendations for further research work concerning SLCA in bio-industries are also presented.