Developments in Social Life Cycle Assessment (S-LCA) for Life Cycle Sustainability Assessment (LCSA) - application to the construction and demolition sector in France

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The results of a project aiming at developing a methodology for sustainability analysis dedicated toinfrastructures and buildings construction projects will be presented.Thisresearch project was carried outin collaboration with ADEME (French agency of environment and energy control), University of technology of Troyes, the Industrial Ecology Club (guild) of Aube and Eiffage (French public works firm).The projectis based on a specific case-study concerning the construction of a part of the ring road of Troyes city (Aube, France) where alternative construction materials and techniques,such as secondary raw materials and local natural resources,have been used.

A sustainabilityLCA framework was designed, built on environmental and social LCA methodologies to assess the environmental and social efficiency of such construction projects. It wasapplied to the case study to compare its global performance with a similar case which would have been conducted in "business as usual" conditions.An environmental LCA was conducted,based on existing international standards. At the same time,a S-LCA methodology was developedon the basis of UNEP-SETAC Guidelines and applied to the French sector of building and construction, to assess social impacts supported by the system's stakeholders.

Results showeda high contribution of natural mineral resources use in the total environmental impact, due to extraction and transportation. It was also demonstrated that the energy necessary forasphalt production was much higher than the one for itsimplementation. Environmental impacts are thus highly dependent on asphalt production and natural mineral resources' quantities and origin. Regarding social impacts, specific impacts categories, indicators and data were searched for and an impacts screening was conducted. Based on sectorial data, itfocuseson two stakeholders' categories:workers and local communities. Final results highlight the fact that S-LCA needs strong methodological developments to address intraEurope comparative case-studies and to produce methodologies for system definition, data inventory, impacts characterization, reference databases and indicators.