

Life Cycle Sustainability assessment of hybrid multi-storey building



LIRIDE

Research team

Rizal Taufiq-Fauzi (*Ph.D. Candidate, civil and building engineering, University of Sherbrooke*)

Supervisor : Ben Amor

Co-supervisor : Patrick Lavoie (FP Innovations)



Context

The trend shows that, in the future, hybrid multi-storey building will be massively constructed due to the increasing demand. Building sector, itself, is also a major contributor to the excessive extraction of global natural resources and the emission of greenhouse gases (UNEP, 2007). It is unquestionable that to assess sustainability performance of product/service we need an integrated assessment which not only covers three sustainability cores but also embody the life-cycle thinking in our way of evaluation.



Goal

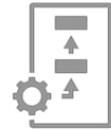
The main goal of the project is to develop life cycle sustainability assessment (LCSA) methods and to apply the obtained tool for the hybrid (wood-concrete) multi-storey building. To do so, the new LCSA methods will integrate three assessment tools that represent three pillars of sustainability, Life Cycle Assessment (LCA) for assessing the environmental impacts, Life-cycle Costing (LCC) for the economic and Social Life Cycle Assessment (SLCA) for the social aspect. The second main goal is to extend the development of the LCSA methods so that it is useful not only for comparison purposes but also for assessment of indirect impacts (consequences) due to the deployment of hybrid multi-storey building that is seen going to be rising in the coming decade.



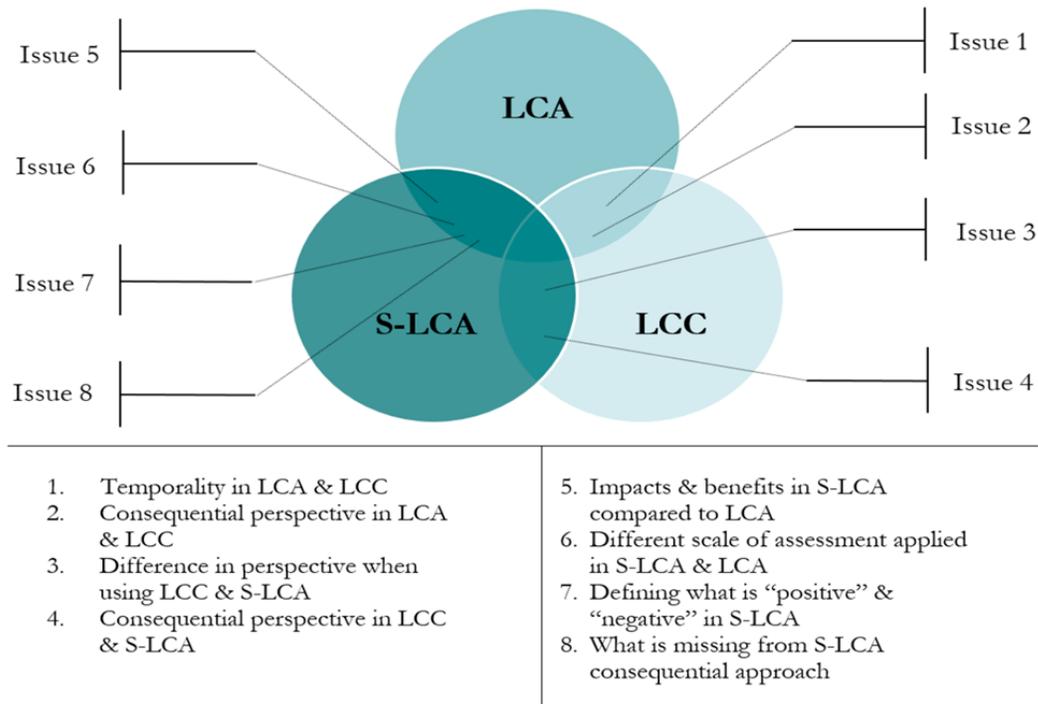
Methods

The main methods that will be used in this project is LCSA, a framework consisting of LCA+LCC+SLCA. By using this framework, the expected results that will be achieved are comprehensive sustainability assessment results with life-cycle thinking approach from cradle to grave in hybrid (wood-concrete) multi-storey building including the assesment

Methods



of the environmental impact (global warming potential, energy consumption, human toxicity, ozone depletion, etc.), economic performance (building and material cost, labor cost, maintenance cost, external cost, etc.) and social impact (working hours and well-being of workers, health, and safety of building users, etc.) The method will be used to answer some challenges that existed in LCSA framework.



Applications



With the growing numbers of hybrid (wood-concrete) multi-storey building being built currently and potentially in the future, this methods and tool could be used to better understand the sustainability performance (i.e. both positive and negative impacts) on the environmental, social and economic aspects of their buildings. This certainly could help stakeholders (i.e. SQI and SHQ) and collaborator (i.e. FPInnovations) to understand the improvements that could be applied in building to have better sustainability performances.

