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# Cradle to grave life cycle assessment of Chardonnay white wine

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Life Cycle Assessment (LCA) is an international tool that evaluates the environmental impacts of a product, service, or process throughout its life cycle. The aims of the current cradle to grave LCA study are to (1) Assess the environmental impacts of the Chardonnay white wine produced by Château Ksara – Lebanon (33.8265°N, 35.8926°E) from grape production phase until the end of life phase (recycling, landfilling, or incineration scenarios) through winemaking, packaging, distribution and use phases (2) Compare the environmental footprint results of the Chardonnay white wine with those of the screening study carried out in Europe. The Life cycle inventory was modeled using the SimaPro 8.5.2.0 analyst multi-user software and the Ecoinvent database (version3.3) and the ILCD methodology was selected as the life cycle impact assessment method. Based on the normalized and weighted results and excluding the toxicity related impacts, the most relevant impact categories are mineral, fossil use & resource depletion, climate change, ionizing radiation human health, particulate matter, terrestrial eutrophication and acidification for a cumulative contribution of 85.10% of the total impact. The grape production, packaging & bottling and winemaking life cycle stages are the ones identified as "most relevant" for a cumulative contribution of 86.03% of the total impact for climate change impact category. The findings of this research are promising since they are comparable to those of the screening study carried out in Europe. Furthermore, sensitivity and uncertainty analyses are performed to check the robustness of the results.

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