Adapting of Life Cycle Inventories of agricultural products to regional contexts: the case of Brazilian soybeans

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Even with a lower growth rate, the world population will increase and with it the need for food. Soy is very important in this context because it is raw material for many industrial products and feed. Brazil, as the world's largest soybean exporter and the second largest producer, has a responsibility to understand and act on reducing the environmental impacts of the activity. Many researchers take databases to their inventories that were based in the European context when making a Life Cycle Assessment (LCA) for products using Brazilian soybeans, because there is no Brazilian database.

One of the big differences between the soybean production in Brazil, with European producing countries, is the size of the properties. In Brazil, according to the latest agricultural census, 43% of farms are larger than 1,000 hectares (ha). A consequence of the vast expansion of agricultural areas is the requirement of large equipment usage, more Effective Field Capacity (EFC), namely, able to cover more acres per hour. In the European context, the equipment is smaller, with EFC and diesel consumption different than Brazil. When agricultural operations of European databases are inserted in Brazilian agricultural processes inventories, diesel consumption and emissions from its combustion are erroneously estimated. In order to evaluate whether these differences are relevant, this study assesses the impact caused by agricultural operations considering two scenarios for one Brazilian farm: 1 - using data on equipment available in Ecoinvent® database for Brazilian soybeans; and 2 - considering primary data from a case study. From the analysis of these scenarios, it was confirmed the need to generate agricultural processes inventories relevant to the conditions of the study area (Brazil), preferably gathered in a national database and also available in international databases.