

Life-Cycle Analysis of Environmental Load and Reduction Potential Related to Food Consumption in Japan

Agriculture is one of the major emission sources of greenhouse gases (GHGs) including non-CO₂ gases and has figured as a cost-effective sector for GHG emissions reduction. Japan's food supply, especially for wheat and animal feed, mostly relies on imports from the U.S. and Australia by long distance maritime transportation, although Japan is mostly self-sufficient in rice, the nation's staple food. A life-cycle approach is applied for evaluating agricultural biomass utilization policy at the regional level and the environmental load of agricultural production at the commodity level. However, it is difficult to implement a life-cycle analysis in global studies on agricultural GHG reduction potential because of the geographical scale.

We estimated the environmental load (GHG emissions and final disposal of waste) related to food consumed in Japan and its reduction potential, including a cost analysis, through energy use, fertilizing, biomass utilization, distribution and recycling. This country-level evaluation is implemented by aggregating commodity-level or regional-level estimations, and the calculated cost efficiency of the environmental load reduction. A scenario analysis is used to consider the uncertainty of estimation conditions.