

Towards a Circular Economy: An Application of Input-Output Oriented Approach to Improve Eco-efficiency of Australia's Food Industry

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Abstract

The food industry in Australia (agriculture and manufacturing) performs a fundamental role in Australian society, contributing to improvements in socio-economic sectors nationally. The Australian food industry generated a gross production value of \$ 155 billion, contributing 12% to Australia's Gross Domestic Product in 2010-2011. However, the industry has been causing severe environmental stresses during the production of food. The agricultural sector in Australia is the largest consumer of water. Additionally, land degradation, greenhouse gas emissions, energy consumption and waste generation are considered the main environmental impacts caused by the industry.

The research project aims to evaluate the eco-efficiency performance of various sub-sectors in the Australian food systems through the use of input-output oriented approaches of data envelopment analysis and material flow analysis. This helps in establishing environmental and economic indicators for the industry. The results are expected to identify inefficiencies during the life cycle of food production in Australia. Based on the principles of industrial ecology, the study recommends the implementation of more sustainable processes to increase efficiency, diminish undesirable outputs and decrease the use of non-renewable inputs within the industry's production cycle. The final research outcomes are projected to be useful to inform decision makers about the advantages of moving from a traditional linear system to a circular production system, where a sustainable and efficient circular economy could be created in the Australian's food industry.

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