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Comparison of Environmental Assessment Methods in the Analysis of the Energy Efficiency in Agricultural Production Systems

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Abstract

In recent years, various environmental assessment methods have been developed. The aim of this paper is to compare these methods to identify their advantages and disadvantages when used to analyze energy efficiency in agricultural production systems. A systematic review of information helped to identify six environmental assessment methods: ecological footprint, material flow analysis, ecological network analysis, life cycle analysis, exergy and emergy. A multi-criteria comparison was carried out, taking into account the level of formalization, system modeling, spatial scale, inventoried flows, type of indicators, relationship with the concept of efficiency and usability of each of the methods. This work allowed to highlight the strengths and weaknesses of each environmental assessment method. Proving that the Emergy approach, could provide a relevant framework for the analysis of the multiple energy flows that interact in an agricultural production system, and achieving an integral understanding of energy efficiency in the whole system.

Keywords: *Environmental Assessment (EA), Energy Efficiency (E.E.), Agricultural production systems, criteria.*