



# Academic<sup>th</sup>

INTERNATIONAL WORKSHOP  
ADVANCES IN CLEANER PRODUCTION

“CLEANER PRODUCTION TOWARDS A SUSTAINABLE TRANSITION”

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## **Dynamic Model for Evaluation of Sustainability of Brazilian Ethanol Production: Elements for Modeling**

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### **Abstract**

System dynamics is an approach to analyze the behavior of complex systems, such as the productive chains, strictly considering the inherent characteristics. This approach is based on mathematical concepts of nonlinear processes developed in mathematics and physics and consolidated in engineering. The concepts inherent in this approach assists in creating a mathematical model which represents a production chain by using computer simulation. Thus, the main objective of this paper is to present the formalization of the dynamic model of assessing the sustainability of Brazilian ethanol production, its borders (external environment) and the scenarios needed for a deeper understanding of relation of cause and effect, causal loops and diagrams of flows and stocks as a result of the awareness stage, with regard to understanding the problems involved, the survey methodology known as design science.

**Keywords:** *ethanol, system dynamics, sustainability*

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