

AISE – THE SWEET AND BITTER SIDES OF THE SUGARCANE. AN INTEGRATED SUSTAINABILITY ASSESSMENT FOR THE BRAZILIAN ETHANOL CONTEXT

Tadeu Fabrício Malheiros

São Carlos School of Engineering / University of São Paulo (USP)

FAPESP Process 2008/58033-3 | Term: May 2009 to Apr 2012



Photo by Joviniano Pereira da Silva Netto

The recent global movement to encourage bioenergy as an alternative to excessive consumption of fossil fuels has triggered policy actions to promote the energy use generated from biomass in line with sustainable development. In this context, sustainability management modus operandi has to be able to bring the social, cultural, and environmental dimensions to the same priority level of the economic dimension. The current modus operandi of public policy formulation and implementation, based on punctual and setorized socio environmental impact assessment, limits and hides complex productive system functioning essential factors, as observed for the sugarcane ethanol context, enlarging ethanol production sustainability compromising risks. Therefore, with the Brazilian fast growing participation in the global economic scenario, it means that decision makers must be aware of the implications for the transition to an economy driven by biofuels. In this context, tools for evaluating sustainability of ethanol become a need in order to integrate values and principles of sustainable development. However, their effectiveness depends not only on building tools that allow the insertion and integration of large amounts of data. It is essential that the products generated are understood and accepted by the stakeholders, whether under the collective government, business or individual. It is fundamental that these tools have credibility among decision makers. In this context, this research focus at carrying out a strategic analysis of the socio-technical network of sugarcane ethanol for supporting the design, development and implementation of sustainability assessment tools, with a focus at the ethanol policy context at the State of São Paulo. Also efforts will put in developing and applying ISA - Integrated Sustainability Assessment frameworks for sugarcane ethanol context.

SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

The main results of this ongoing applied research are: (i) sustainability assessment applied research network implemented; (ii) several case studies were conducted discussing Sustainability Assessment - SA applied to sugarcane ethanol context; concepts and methodology available for use by the governmental and nongovernmental institutions related to the bioenergy context and also for institutions engaged within the BIOEN Program; (iv) scientific events were organized; (v) courses at graduate level on sustainability assessment implemented; (vi) research team consolidation; (vii) several scientific papers are under analysis for publication in per-reviewed journals.

The concluded dissertations and thesis are:

- Environmental Management System and sugarcane ethanol production in São Paulo State: case studies in the municipalities of Araraquara and Brotas
- Instruments for government intervention and corporate environmental behavior: an analysis of the sugarcane industry in São Paulo State.
- Environmental indicators in the discussion of sustainability: a proposal for strategic analysis in the context of sugarcane ethanol in São Paulo – SP.
- Use of sugarcane biomass to generate electricity: energetic, exergetic and environmental analysis of cogeneration systems in sugarcane plants in the State of São Paulo
- Biofuel integrated production: a proposal for fossil fuel reduction in sugarcane ethanol life cycle
- Environmental Marketing and socio-environmental certifications: an analysis of Brazilian ethanol context
- Indicators System for Water Resources Sustainability Assessment in the context of sugarcane sector: methodological contribution for planning and management
- Analysis of environmental vulnerability in the planning space for growing sugarcane in the State of São Paulo

The ongoing dissertations and thesis research are

- Sustainability Assessment Methodologies: potentialities for applying to sugarcane ethanol context
- Environmental Cumulative Impacts of the ethanol production system
- Scenarios Design as tool for local environmental management systems- case study for Brotas, SP
- Sugarcane Ethanol Socio-technical Network Actors: a social-representations study on sustainability



Figure 2. Research project developed with the engagement of the Brotas Municipality Environmental Council. The goal was to improve strategic planning process capacity through participatory scenario design for the ethanol context (Photo by Ana Paula Regra)

Tadeu Fabrício Malheiros

Escola de Engenharia de São Carlos
Universidade de São Paulo (USP)
Departamento de Hidráulica e Saneamento
Av. São Carlene, 400 – Centro – Caixa Postal 359
CEP 13566-590 – São Carlos, SP – Brasil

+55-16-3373-9534
tmalheiros@usp.br