

Final Progress Report
Sustainability Science Program, Harvard University
Term: September 1, 2011 – August 31, 2012
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Name: Annalisa Zezza

Your field(s):

Energy, agriculture

Your degree program, institution and (expected) graduation date:

PhD., Agricultural Economics and Policy, University of Naples, 1987

Faculty host(s) at Harvard name and department:

Henry Lee

Description of SSP-related research activity:

Title: Sustainability Certification in the Biofuel Sector: A Case Study of Brazilian Ethanol

Abstract: The research objective is the identification of the conditions under which voluntary certification could be an answer to the governance of sustainability at the global level in the biofuels sector. The study addresses the case of biofuel sustainability certification in Brazil and the role of the EU Directive on biofuels. The case study has permitted to identify and analyze some of these factors as the degree of dependence from foreign market, the policy environment, the structure of the supply chain, the benefits and costs associated to certification as well as some unintended consequences. The research has been conducted through a case study in the state of Sao Paolo (Brazil).

Identification of the problem you address:

Are voluntary sustainability certification schemes effective in the biofuel sector? My research addresses the case of biofuel certification as a tool for regulating the impact of biofuel production on GHG (greenhouse gases) emissions and on the use of natural resources. Sustainability certification has arisen together with increasing concerns about the impact of large-scale production. These concerns mainly regard the effects in terms of the efficiency in pursuing greenhouse gas emissions savings on one hand, and other environmental and social issues linked to the change in land use, as the clearing of forests and food security on the other hand. Other concerns regard labor issues and land rights in regions where large plantations take place. Inter-governmental organizations, NGOs, other public or private stakeholders are participating in various international initiatives on sustainable biofuels or biofuels feedstock. The case study has the objective to assess how international markets; national policies and local factors interact to influence sugarcane producers to adopt certified sustainable production practices.

Key question asked about the problem:

What are the conditions under which sustainability certification schemes are effective policy tools in pursuing sustainable development in the biofuel industry?

Is the EU directive on biofuel sustainability a driving force in determining the effectiveness of third party certification schemes?

The methods by which you answered that question:

The case study has been conducted in the State of Sao Paulo in Brazil through semi-structured interviews with key stakeholders in the sugar cane industry, NGO's, government and external experts and complemented with extensive literature review and visits to mills that had achieved certification. Field analysis is organized in the following steps:

- Analysis of the regulatory context: setting of standards; process implementation; enforcement monitoring
- Interviews with government officials and stakeholders in certification initiatives
- Analysis of certified and not certified firm strategies, use of certification, perceived cost and benefits

Principle literature upon which the research drew:

energy policy, management of environmental resources, supply chain governance, standard and certification, public policy

Empirical data acquisition description:

Field work in Brazil

Geographical region studied: Brazil:

State of Sao Paulo

Recommendations that might be relevant for your problem:

This study has explained how a combination of industry structure, policy reforms, stricter laws enforcement, and changes in the export market, emerging markets for new products have contributed to this result and the role played by third party voluntary certification schemes. Main recommendations are:

- Although demand for certified sugarcane is growing, wider adoption of sustainability certification rests on the development of sensitive markets.
- Price premiums are rarely perceived although other benefits as market access, increased portfolios of clients, higher efficiency, are evident.
- Low enforcement of environmental and labor regulations lowers the opportunity cost of getting certification. Nevertheless is evident that in Brazil there is a pull-push action is going on in this direction from the interaction of market forces and public regulations.
- The EU RED has contributed in advancing this process creating a favorable environment for policy reforms and company consolidation but it has not delivered its full potential because of two main factors: small size of competing market and limitations derived by the definition of sustainability that is found in the directive.
- The removal of trade barriers (i.e. the EU ethanol tariff) would foster the development of sustainable biofuel production worldwide and the fulfilling of EU commitments under the Kyoto Protocol at a lower cost.
- Main challenges in balancing growth and sustainability is soil degradation associated to the expansion of sugar cane. Preventing the deterioration of aquatic systems due to accelerated erosion and to the discharge onto surface waters of vinasse, characterized by high potassium and carbon content, rests on the enforcement of the forest code on riparian areas and of the new legislation created to ban the direct discharge of vinasse.
- Increasing economies of scale and land concentration have meant that benefits of sugarcane ethanol production for small landowners have so far been limited and large farmers and industrialists have benefited more from the expansion of the industry. Evidence from Brazil indicates that economies of scale in the size of plant used have been vital in bringing operating and capital costs below those of the feedstock and in making ethanol competitive against petroleum fuel. Selections of improved cane varieties (e.g. energy cane) and investment in irrigation have helped to improve yields but the benefits of these have mostly been felt on plantations. Attention should be devoted to inequality arising from land concentration associated to the expansion of monocropping areas, reduction of sugar mill numbers, growth in foreign investment and land acquisition.
- Some benefits of certification are intangible as the strengthening of social capital and the improvement of community-cooperative governance structures. In this case study it has emerged certification's role in generating significant attitudinal change and in creating a learning environment, raising awareness and disseminating knowledge. Efforts in one sector can spread to other commodities or markets.

- More research is needed to understand which conditions increase the effectiveness of voluntary certification, the distribution of cost and benefits, and positive and negative unintended consequences.

A description of the final product(s) you have/are aiming to produce:

SSP working paper and peer-reviewed journal article

Description of major other intellectual or professional advancement activity(ies) over the past academic year:

one journal article, one conference presentation , elected in the Board of the Italian Association of Agriculture and applied economics (AIEAA)

Citations for reports, papers, publications and presentations that built on your fellowship research:

Sustainability Certification in the Biofuel Sector: A Case Study of Brazilian Ethanol– Presentation at the First Conference of the Italian Association of Agricultural and Applied Economics (AIEAA) - Trento (Italy), June, 4-5 2012 “Towards a Sustainable Bio-economy: Economic Issues and Policy Challenges”

http://www.aieaa.org/index.php?option=com_content&view=article&id=28&Itemid=150

Paper accepted at the Seminar of the European Association of Agriculture Economics – Uppsala, Sweden, August 31st 2012 “Did agricultural economics disappoint? Empirical Applications on Governance of Food and Fibre Value Chains”

<http://www.slu.se/economics-eaae-seminar>

Principal collaborators outside Harvard:

National Institute of Agriculture Economics- Italy

If you are moving to a new position, please list your contact information there:

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