

Sustainability and certification in the biofuels sector: some critical observations

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Abstract

The society at large demand sustainable production of products often defined in terms of the planet, profit and people categories. Many industrial sectors started to internalize sustainability in their company processes. Public policies underscored these initiatives by giving incentives to raise awareness, support initiatives and disseminate the value of sustainability. In the last decade initiatives came to life to connect confidence, trust and sustainability in the agri- fuel- and food industry. One of the more interesting attempts are Round Tables for sustainable production of palm oil, forest exploitation, biofuels, sugar or soybean. However, are the results positive. Some of these initiatives seem more successful than others. The question is why? How can one interpret these initiatives in terms of performance, structure and governance mechanisms? Based on a comparison of several of these initiatives, conclusions are drawn and hypotheses defined. More in particular, the observations focus on network development, weaknesses in the governance structures, ambivalence in the public domain and the resulting societal confusion.

Keywords: sustainability, certification, biofuels sector.

1. Introduction

Sustainability is a broad term that has no clear definition. It is seen as an important but vague term, like terms as freedom or justice. In order to get an idea of the wide variety of sustainability four different interpretations are given below:

- *The use of goods and services that correspond to the basic needs and bring a better quality of life. This use should promote at the same time minimization of the use of natural resources, toxic materials, emissions and waste contamination and should not jeopardize the needs of future generations. (IIED,1998)*
- *The focus of sustainable consumption is on the economic activities of choosing, using and arranging of goods and services and how these activities could be modified to benefit social and environmental issues. (NCC,2003)*
- *Sustainable consumption is not about consuming less, it is about consuming "differently", consuming more efficient and about improving the quality of life. (Ofsted, S ,1994)*
- *Sustainable consumption is a balancing act. This means that we consume in a way which protects the environment, natural resources are wisely used and the quality of life is promoted, while the lives of future consumers will not be jeopardized. (UNEP ,1999)*

The examples show the different interpretations of the concept of 'sustainability'. Basically all interpretations combine the same aspects: environmental, economic and social development. The combination of these aspects is shown in *figure 1* below,

depicting the three pillars definitions of sustainability often refer to.

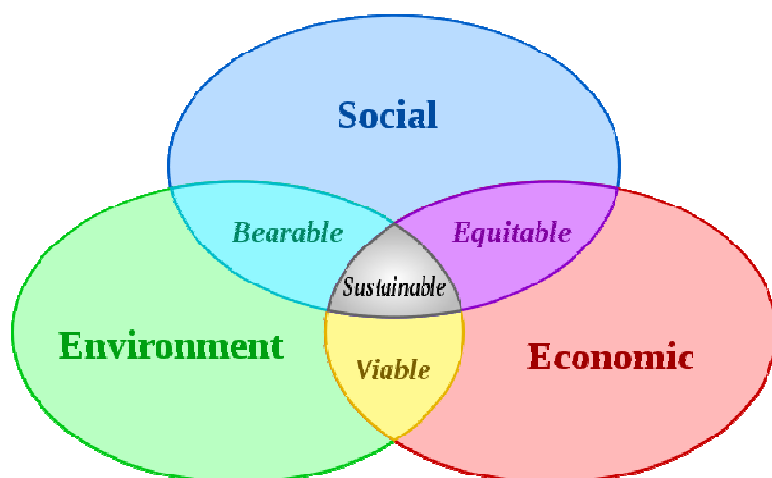


Figure 1 Sustainability aspects (Adams, 2006).

However there is no consensus on a definition of sustainability. Some argue about consuming differently, others about consuming less. Therefore it is no surprise that to measure sustainability different sets of criteria and indicators are used. In the area of certification also leading to a wide variety of certification initiatives (Trienekens et Zurbier, 2008). The process of being certified involves the applicant proving that it meets the policy objectives, as detailed through the criteria. Documentation, analyses, audits and other supporting information are usual. Woods and Diaz-Chavez (2007) describe the issues normally addressed as principles (general tenets of sustainable production), criteria (conditions that must be met to achieve those tenets and that “define the indicators to be answered”) and indicators (the questions that show how the applicant proves that a criterion has been met.

In the food and biofuels sectors current initiatives are for example the Round Table on Responsible Soy, The Round Table on Palm Oil, the Better Sugar Initiative or the Round Table on Biofuels. These examples are just a fraction of initiatives. Although these initiatives deserve a welcoming legitimatization for improving production systems, one may ask whether actors in the value chains and networks, including customers and consumers, are benefitting from these numbers of initiatives, leading to numbers of certificates, labels, logo’s, inspection procedures, costs of compliance and, shortly, the overall confusion these initiatives create.

One may ask whether the existing initiatives contribute to sustainable food, feed and fiber production. To answer this question, we focus on initiatives in the biofuels sector. Some of these initiatives are more successful than others. The question is why? How can one interpret these initiatives in terms of performance, structure and governance mechanisms? Based on a comparison of several of the initiatives within one sector, the biofuels conclusions are drawn and hypotheses defined. The objective of the comparison is to contribute to the general debate on certification.

This paper uses secondary data for describing and analyzing the current initiatives in the biofuels sectors. First, we give an overview of initiatives in the biofuels sector. Next, a comparison is made of several of these initiatives. These results are analyzed and finally, conclusions are drawn.

2 Certification initiatives in the biofuels sector

Worldwide initiatives are taken to develop a set of sustainability criteria. Different stakeholders are involved in this process: governments, NGO's, research institutions, private companies and the society. The logic following step is to make progress on certification of sustainable produced biomass and biofuels. Initiatives are plenty, but because of this there is the risk of proliferation of various certification systems. To get insight in which initiatives are taken and which of these could play an important role globally an overview has been made of these initiatives (*Figure 1*)

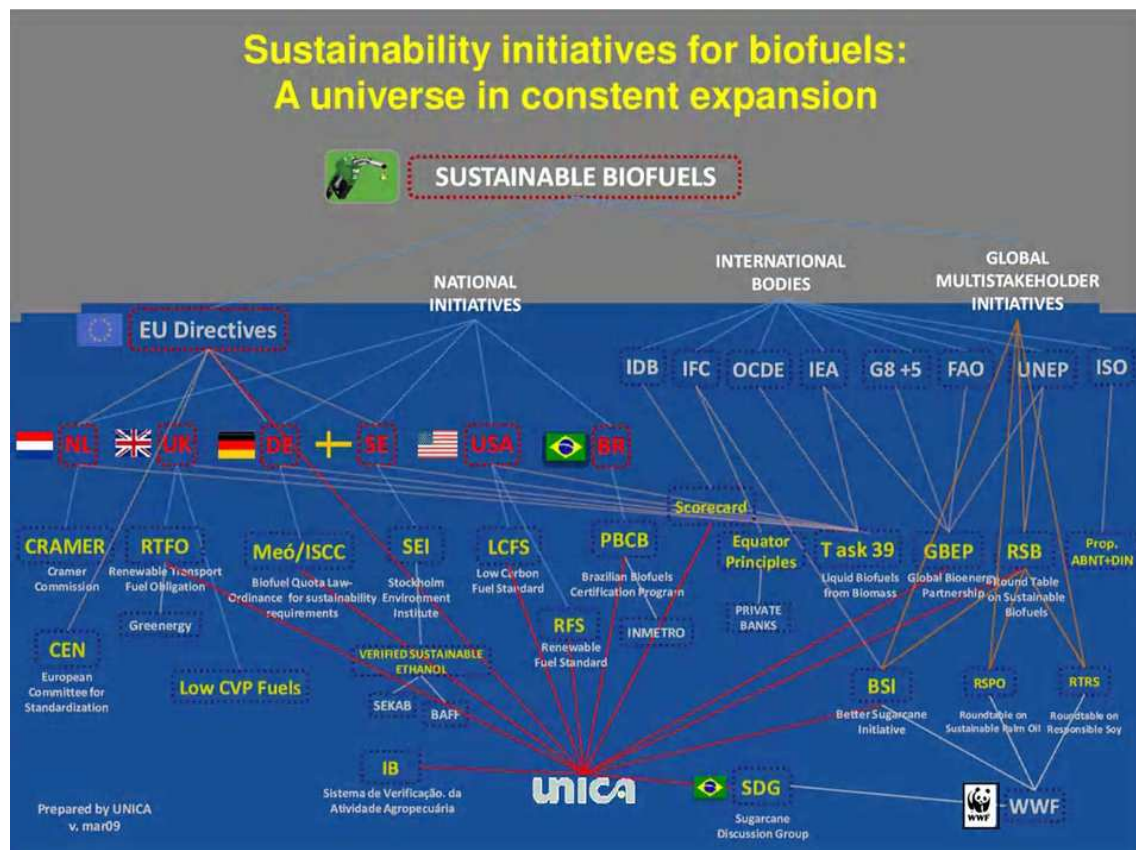


Figure 2 Biofuels certification initiatives (Unica, 2009).

To compare the initiatives and their sets of sustainability criteria, initiatives were selected which are in an advanced stage of development. To get a set of initiatives which can be compared two requirements were used:

The set should be a far-reaching multi-stakeholder initiative: this improves the chance of worldwide acceptance and application.

Criteria and indicators should be defined. When criteria and indicators are not defined, initiatives may change and comparison on basis of 'ideas' is more difficult.

This resulted in three sets which are multi-stakeholder initiatives, shown in *table 1*: *The Netherlands based NEN, the Round table on Biofuels and the Better sugar initiative..* These are criteria sets may become easily operational and are ready for field testing. Below the three initiatives are described more in detail.

NEN (NEderlandse Norm, Dutch normalization institute)

The Dutch cabinet and the European Commission have set ambitious targets for the share of renewable energy and biofuels in the total use of energy and fuels. Biomass will play an important role for the generation of energy and the conversion into

transportation fuels. A condition for the application of biomass for energy purposes is that the biomass has been produced sustainably.

To be able to measure this sustainable production the project group “Sustainable production of biomass” under chairmanship of Jacqueline Cramer published and presented the final report *Testing framework for sustainable biomass* in February 2007. The project group has identified six themes within which sustainability criteria are formulated:

- 1) Greenhouse gas emissions
- 2) Competition with food or other local applications
- 3) Biodiversity
- 4) Environment
- 5) Prosperity
- 6) Social well-being

These Cramer criteria are broadly supported in the Netherlands and are considered a minimum requirement for the application of biomass for energy purposes.

In April 2008, “Sustainable produced biomass for energy applications” was established in Europe to make voluntary agreements on a European level concerning sustainable biomass, primarily used for energy purposes. CEN/TC 383 will prepare standards for sustainable produced biomass, which are applicable to, but not limited to, the European directive for renewable energy (directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources), which is under development at this moment. The first publication of CEN/TC 383 is expected in the beginning of 2011.

However Dutch stakeholders, both government and economic operators, need a certification scheme for sustainable produced biomass for energy purposes in the short term. The development of a European standard takes too long in this respect. Therefore the Dutch technical agreement (NTA) that includes verifiable generic requirements based on the Cramer criteria was developed and released in March 2009. The NEN standard cover the following principles:

Principle 1: The greenhouse gas balance of the production chain and application of the biomass is positive

Criterion 1.1: In the application of biomass a net emission reduction of greenhouse gases shall take place along the whole chain. The reduction is calculated in relation to a reference situation with fossil fuels.

Principle 2: Biomass production is not at the expense of important carbon sinks in the vegetation and in the soil

Criterion 2.1: The conservation of above-ground (vegetation) carbon sinks when biomass units are planned.

Criterion 2.2: The conservation of underground (soil) carbon sinks when biomass units are planned.

Principle 3: The production of biomass for energy shall not endanger the food supply and local biomass applications (energy supply, medicines, building materials)

Criterion 3.1: Insight into the change of land use in the region of the biomass production unit.

Criterion 3.2: Insight into the change of prices of food and land in the area of the biomass production unit.

Principle 4: Biomass production does not affect protected or vulnerable biodiversity and will, where possible, strengthen biodiversity

Criterion 4.1: No violation of national laws and regulations that are applicable to biomass production and the production area.

Criterion 4.2: In new or recent planning, no deterioration of biodiversity by biomass production in protected areas.

Criterion 4.3: In new or recent planning, no deterioration of biodiversity in other areas with high biodiversity value, vulnerability or high agrarian, nature and/or cultural values.

Criterion 4.4: In new or recent planning, maintenance or recovery of biodiversity within biomass production units.

Criterion 4.5: Strengthening of biodiversity where this is possible, during planning and by the management of existing production units.

Principle 5: In the production and conversion of biomass, the soil and soil quality are retained or even improved

Criterion 5.1: No violation of national laws and regulations that are applicable to soil management.

Criterion 5.2: In the production and conversion of biomass best practices are applied to retain or improve the soil and soil quality.

Criterion 5.3: The use of residual products is not at variance with other local functions for the conservation of the soil.

Principle 6: In the production and conversion of biomass, ground and surface water are not depleted and the water quality is maintained or improved

Criterion 6.1: No violation of national laws and regulations that are applicable to water management.

Criterion 6.2: In the production and conversion of biomass best practices are applied to restrict the use of water and to retain or improve ground and surface water quality.

Criterion 6.3: In the production and conversion of biomass water from non-renewable sources is not used.

Principle 7: In the production and conversion of biomass, the air quality is maintained or improved

Criterion 7.1: No violation of national laws and regulations that are applicable to emissions and air quality.

Criterion 7.2: In the production and conversion of biomass best practices are applied to reduce emissions and air pollution.

Criterion 7.3: No burning as part of the planning or management of biomass production units (BPUs).

Principle 8: The production of biomass contributes towards local prosperity

Criterion 8.1: Positive contribution of private company activities towards the local economy and activities.

Principle 9: The production of biomass contributes towards the social well-being of the employees and the local population

Criterion 9.1: No negative effects on the working conditions of employees.

Criterion 9.2: No negative effects on human rights.

Criterion 9.3: The use of land does not lead to the violation of official property and use, and customary law without the free and prior consent of the sufficiently informed local population.

Criterion 9.4: Positive contribution to the well-being of local population.

Criterion 9.5: Insight into possible violations of the integrity of the company.

With regard to the development of the principles and criteria stakeholders from various backgrounds participated in the process. - the initiative is managed and

structured by a voluntary ad-hoc association of representatives from industry, governmental agencies, NGO's and research and consultancy companies.

RSB (Roundtable on Sustainable Biofuels)

In November 2006, the Ecole Polytechnique Federale de Lausanne (EPFL) initiated a multi-stakeholder workshop to investigate the potential for developing internationally accepted and implementable standards for sustainable biofuels. This resulted in the establishment of the Round table on Sustainable Biofuels (RSB) in 2007. RSB aims to achieve global, multi-stakeholder consensus around the principles and criteria of sustainable biofuels production and builds on existing national and commodity-based initiatives. The standard developed was drafted largely based on work already conducted by the Forest Stewardship Council, the Dutch Cramer Commission, the Low Carbon Vehicle Partnership in the UK, the Roundtable on Sustainable Palm Oil, the ILO's Decent Work agenda, the Sustainable Agriculture Network, the Better Sugarcane Initiative and other sustainable agriculture initiatives.

The basic principles of the RSB are:

PRINCIPLE 1. Obey the Law.

PRINCIPLE 2. Respect Human Rights and Labour Standards.

PRINCIPLE 3. Manage input, production and processing efficiencies to enhance sustainability.

PRINCIPLE 4. Actively manage biodiversity and ecosystem services.

PRINCIPLE 5. Commit to continuous improvement in key areas of their business.

In November 2009 the RSB presented the final version of the RSB standard which will be field tested in different regions around the world during 2010. In this standard 12 themes are formulated:

- 1) Legality
Biofuels production shall follow all applicable laws of the country in which they occur, and shall endeavor to follow all international treaties relevant to biofuels' production to which the relevant country is a party.
Biofuels projects shall be designed and operated under appropriate, comprehensive, transparent, consultative, and participatory processes that involve all relevant stakeholders.
- 2) Planning, Monitoring and Continuous Improvement
Biofuels projects shall be designed and operated under appropriate, comprehensive, transparent, consultative, and participatory processes that involve all relevant stakeholders.
- 3) Greenhouse Gas Emissions
Biofuels shall contribute to climate change mitigation by significantly reducing GHG emissions as compared to fossil fuels.
- 4) Human and Labor Rights
Biofuels production shall not violate human rights or labor rights, and shall ensure decent work and the well-being of workers.
- 5) Rural and Social Development
Biofuels production shall contribute to the social and economic development of local, rural and indigenous peoples and communities.
- 6) Local Food Security
Biofuels production shall not impair food security.
- 7) Conservation

- Biofuels production shall avoid negative impacts on biodiversity, ecosystems, and areas of High Conservation Value.
- 8) Soil
Biofuels production shall promote practices that seek to improve soil health and minimize degradation.
 - 9) Water
Biofuels production shall optimize surface and groundwater resource use, including minimizing contamination or depletion of these resources, and shall not violate existing formal and customary water rights.
 - 10) Air
Air pollution from biofuels production and processing shall be minimized along the supply chain.
 - 11) Economic efficiency, use of Technology, inputs, and management of waste
Biofuels shall be produced in the most cost-effective way. The use of technology must improve production efficiency and social and environmental performance in all stages of the biofuels value chain.
 - 12) Land Rights
Biofuels production shall not violate land rights.

Looking in the constituency of the RSB governments, private sector, NGO's and researchers are participating in this initiative. The secretariat is run by the EPFL, a non-government institution.

BSI (Better Sugarcane Initiative)

The BSI is an initiative of the World Wildlife Fund (WWF). One of the aims of the BSI is to determine principles and to define globally applicable performance-based standards for 'better sugarcane' with respect to its environmental and social impacts. In November 2009 version 2 of the BSI standard was approved for field testing

In this standard 5 themes are formulated:

- 1) Obey the law.
- 2) Respect human rights and labour standards.
- 3) Manage input, production and processing efficiencies to enhance sustainability.
- 4) Actively manage biodiversity and ecosystem services.
- 5) Continuously improve key areas of the business

From a stakeholder point of view the BSI has participants from the private sector, NGO's and researchers.

3 Comparing the sustainability initiatives

Table 1 shows the main characteristics of the three criteria sets. The results show that all three cover the themes, have defined criteria and indicators. The stage of development vary among the three.

Comparison criteria sets	RSB	BSI	NEN
Stage of development of criteria			
Themes defined	✓	✓	✓
Criteria defined	✓	✓	✓
Indicators defined	✓	✓	✓
Certification process started		✓	✓
Criteria approved by government			✓

Table 1 Comparison of criteria-sets on stage of development

Next, the sets of sustainability criteria were compared via the method suggested by van Dam, et al. (2007) - *Overview of recent developments in sustainable biomass certification*. They define the following factors which contribute to the successful development of a certification system:

1. Stakeholder involvement
The success of a biomass certification system depends on the involvement and support of the wide range of parties involved in the biomass production, trade and processing chain. Because stakeholder groups have different interests in biomass certification, full involvement of all stakeholders, including small stakeholders, is advisable. For example possible different interests of stakeholders can be:
 - Companies: use the certificate as a marketing tool.
 - NGO's: use the certificate to promote sustainable environmental management.
 - Governments: use the certificate to promote sustainable consumption patterns.
2. Securing sustainability concerns
Sustainability concerns are more secured in a certification system where standards of a certification system are (partly) translated into policy instruments. The criteria set should contain criteria which are binding, like compliance to national/international law.
3. Level of flexibility
with minimum standards or a pathway may enhance the flexibility of a system.
4. Feasibility in costs
In the debate on certification costs of compliance play an important role for explaining the success of certification: if these costs are becoming too high for companies, the rate of success will decline.
Compliance costs are the costs to firms and individuals of those activities required by regulators that would not have been undertaken in the absence of regulation. Thus the term 'compliance costs' as used here refers to the incremental costs of compliance caused by regulation, not to the total cost of activities that happen to contribute to regulatory compliance. Examples of compliance costs include the costs of any additional systems, training, management time and capital required by the regulator. For example: on producer level: producers' costs associated with the compliance with requirements in the fields of environment, production systems as implemented at farm level and costs of associated with the provision of public goods, such as landscape preservation and land management practices through agricultural activities
5. Scope of possible regulation (legitimacy)
In general it is desirable for a sustainable biomass standard to be internationally regulated, because this requires acceptance of such standards under international law. However, using international environmental agreements also has its limitations. Standards agreed upon are unlikely to be ambitious and international agreements and full implementation by contracting parties can take a long time. The initial development of biomass certification

on national level, possibly expanded into an agreement on international level on a longer term, seems to be more feasible.

6. Compliance with national legislation
Environmental problems vary in different parts of the world, as well as national regulation. Therefore a minimum set of international standards which comply with national regulation to reach a certain level of sustainability is desired.
7. Level of comprehensiveness and international coherence
As stated before there is the risk of proliferation of criteria, standards and systems. To prevent this international coherence is needed.
8. Limited time horizon for implementation
A comprehensive, reliable and controllable biomass certification system is most efficient to secure the sustainability of biomass. However this can lead to a long process of international negotiation. A system which can be established in a couple of years will be important to secure the sustainability of biomass.
9. Avoiding the creation of additional trade barriers
As stated before stakeholders have different interests in developing biomass certification. This can lead to creation of additional trade barriers. For example possible trade barriers can be:
 - Companies: especially larger ones, active in the entire bio-energy chain may refuse knowledge exchange to get competitive advantage.
 - Countries: could use certification as a trade barrier to protect its own biomass production.

Avoiding the creation of additional trade barriers and the implementation of an international biomass certification system involves a wide range of parties and requires therefore good coordination and coherence within and between stakeholders. The sets of sustainability criteria were compared via the method of van Dam, et al.(2007).

Comparison of criteria sets	RSB	BSI	NEN
Factors			
1., Stakeholder involvement	✓	✓	✓
2. Securing sustainability concerns	✓	✓	✓
3. Level of flexibility	✓		
4. Feasibility in costs (1)	?	?	?
5. Scope of possible regulation (legitimacy)	?	?	?
6. Compliance with national legislation	✓	✓	✓
7. Level of comprehensiveness and international coherence	✓	✓	✓
8. Limited time horizon for implementation	✓	✓	✓
9. Avoiding the creation of additional trade barriers	✓	✓	✓

(1) The feasibility in costs of biomass certification is at this point still largely unknown.

Table 2 Comparison of criteria sets

Comparison of the potential criteria sets by the method of van Dam, et al. show that all three criteria sets contain most of the factors which contribute to a successful

development of a certification system. They only differ on the level of flexibility; where the RSB makes distinction between low requirements and progress requirements for bigger producers. BSI and the NEN created a set of indicators for all producers to comply with. Since a framework with minimum standards or a pathway may enhance the flexibility of a system, the RSB has the most flexible criteria set.

The overall findings show:

- the three sustainability certification initiatives overlap, have the same overall objective, are all based in multi-stakeholder environments and face the same challenge to set criteria, indicators, norms and monitoring systems
- the three initiatives are based on voluntary behavior of the stakeholders and face the challenge to embed their initiatives into the biofuels and sugar (cane) industry and
- the three initiatives partly compete with each other in gaining reputation, establishing institutional and organizational arrangements and public and private acceptance.

It seems that lack of coordination between the three initiatives is due to the voluntary nature of the initiatives, the business prospects for certification involved and the arm-length role of the public sector on national or multilateral level.

4 Analysis

Considering these findings one may discuss some emerging issues.

Role of institutional public policies and private initiatives

The role of the public sector in the debate on sustainability looks limited. However, the set of regulations on most of the principles and criteria is embedded in already existing national or multinational regulations, directives and laws. For example, criteria on labour conditions fit basically the ILO regulations, subscribed by most nations worldwide. Or, to take another example, environmental principles and criteria are linked up or already overlapping in some countries with national regulations on the use of water and agrichemicals, air pollution or conservation of biodiversity. From that point of view, one may argue that the sustainability initiatives are pushing national legislation in the desired direction. By this strategy, the issue of sustainability is becoming a quasi-collective good. Some of the aspects will be perceived as public good, laid down in the hands of the state to govern the distribution of the good, while other aspects of sustainability are perceived as private goods, governed by free market or hybrid forms of organizations. Over time, some of these private goods might become public goods, as in the case of regulations on the use of water. So fundamentally, the question will be how and when the sustainability initiatives will be embedded into governmental laws and regulations and whether that will contribute to successful implementation of sustainable production systems.

The governance structure of the initiatives

In the light of the sustainability initiatives and the governance of the voluntary associations in the biofuels sector, one may look into the efficiency in the bargaining process on quasi-rents. The type of governance structure has consequences for the bargaining over and distribution of quasi-rents (Williamson, 1996). More specifically, not all actors are equal in having control rights and specific control rights might favor some actors over others. The residual rights to make decisions on the use, returns, transfer of an asset that is not specifically controlled by law or assigned by another contract poses the question who has the residual control rights and who is able to

acquire the residual income. At the end, these factors determine the shares in costs and benefits and the sustainability of the relationships in the voluntary associations. The incompleteness of the contracts between the members of the voluntary associations create possible differences between the ex-ante expectations and ex-post outcomes. With weak control rights at hand, the sustainability initiatives might collapse if and when these differences become more urgent and risks are unevenly spread.

Differentiation

According to a study of Imaflora (2009) in the forestry sector, it was concluded, in general terms, that “socio-environmental certification does indeed work and must be supported, but the context of the enterprises and regions must always be properly acknowledged to ensure a differentiated impact evaluation. The general rule (certification norms and requirements) has different effects. Considering that it is essential to preserve the concept of difference as such, and to pass it on to consumers, a regional adaptation of the norms may be considered.”

In the process of certification, a particular mechanism is catering for this challenge. Field tests under varying circumstances should capture the huge variation in production environments.

The problem, however, is that field test can not comply with all these variations. So, variety asks for flexibility in definitions, procedures, data requirements and inspections. Fundamentally, this poses the question how much effort should be put on a centralized coordination and how much on decentralized coordination. The dilemma is becoming obvious: the more centralized the sustainability certification schemes, the less the chance for overall acceptance and feasibility. But also, the more certification schemes become differentiated and decentralized, the higher the chance for incompatibilities and trust attached to the “unified” sustainability scheme.

Incentives and costs of compliance

In general one may assume that organizations may become motivated to participate in the sustainability initiatives. However, there are costs involved. And costs thresholds in the sense, that if the costs fall below the lower thresholds, or rises above the upper threshold, organizations are less likely to perform the activity than if the costs fall between the two threshold levels. For stakeholders and participants in the sustainability platforms, the definition of thresholds becomes clear if the costs of compliance become too high. And because all actors are not equal, the costs for the one may be overshadowed by the costs his competitor has to bear. By result, competitors might be inclined to lower the costs of compliance for themselves and to consent with certification standards that may increase the costs of compliance for others. This challenge might cause the collapse of the mutual understanding, reduce the exchange of information and may end up in the total collapse of the initiative.

Inclusion and exclusion

From a sustainable point of view social and economic inclusion of all relevant stakeholders (Zarilli, 2007). Apart from the moral issue –who has the right to exclude small and/or poor producers due to the costs of compliance?-, the inclusion and exclusion issue may cause changes in the industry structure (Fulponi, 2007). For example, if of the 60.000 sugar cane producers in Brazil, 40% can not cope with the certification standards without investments, what will be the impact on the supply of sugar, bio-ethanol, bioelectricity and derived products? In the certification initiatives

mentioned earlier, this issue has been incorporated by specific arrangements, exclusions and conditional standards. However, it may not stop the included stakeholders to speed up the process of industry structural changes.

Feasibility and acceptance

The main bottleneck is that the certification standard assessment, inspection and accreditation may be affected by difficulties in the collection of data due to their availability, release, and standardization, or even due to product variation, innovations in technology and market oscillations. How to capture these difficulties and dynamics in the world of biofuels certification? Ideally, standardization of methods for data collection, retrieval, use and calibration of methods may help to overcome this. This challenge will contribute to the overall acceptance of the certification process. If this standardization is becoming a “negotiable” good, then the credibility of the initiative may be jeopardized.

5 Conclusions and discussion

Our basic question in this paper is whether the existing initiatives contribute to sustainable food, feed and fiber production. To answer this question, we focused on initiatives in the biofuels sectors. We assumed that some of these initiatives are more successful than others. The results show that all initiatives show striking similarities. The institutional mechanisms to establish certification schemes are almost identical. They all are seeking for compliance to the basic principles for certification (principles, criteria, indicators, auditing, accreditation). They all are focused on expanding the reputation, acceptance and increasing the number of stakeholders. They all are, basically, not government steered, but based on the principle of voluntary association. And, finally, they all have a global scope.

Finally, we raised several issues concerning the sustainability certification initiatives. We conclude that there is an overall acceptance of the notion of achieving sustainable production (and distribution) systems. The certification initiatives contribute to achieve this. The global initiatives in the biofuels sector pose, however, some fundamental questions. If these questions are not dealt with properly, due to speeding up the process, overlooking impacts and political interferences, these initiatives may fail. And that is not a favor to society at large.

References

- Adams, W.M., 2006. The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century. Verslag van het IUCN Renowned Thinkers Meeting, 29-31 January 2006.
- Alfon, I., and Andrews, P., 1999, “Cost-benefit analysis in financial regulation — how to do it and how it adds value”, FSA Occasional Paper Series 3.
- BSI, 2009. BSI Public Consultation Standard Version 2, 2009
- Charnovitz, S., Earley, J. and Howse, R. 2008. “An Examination of Social Standards in Biofuels Sustainability Criteria”. International Food and Agricultural Trade Policy Council. Washington D.C., USA.
- Cramer Commission, 2007. Testing Framework for Sustainable Biomass: Final Report from the Project Group ‘Sustainable Production of Biomass. Interdepartmental Project Management for Energy Transition. Utrecht, The Netherlands.

Dam van, 2008. Overview of recent developments in sustainable biomass certification. Elsevier Ltd.

Faaij, A. Lewandowski, I., 2006. Steps towards the development of a certification system for sustainable bio-energy trade. Copernicus Institute for Sustainable Development and Innovation, Utrecht.

Fulponi, 2007. L. Private voluntary standards and developing country market access . WTO.

IIED, 1998. Consumption in a sustainable world, International Institute for Environment and Development, Oslo.

Imaflora, 2009. Does certification make a difference. Impact assessment study on FSC/SAN certification in Brazil. Piracicaba.

NEN, 2009. NTA 8080 Sustainability criteria for biomass for energy purposes.

NCC, 2003. National Consumer Council, UK.

Ofsted, S., 1994. Symposium Sustainable consumption. Ministry of Environment, Oslo.

RSB, 2009. Principles & Criteria for Sustainable Biofuels.

RTRS, 2008. Draft RTRS Principles and Criteria: Third Public Consultation Document. Document reference: DG4-OUT-02-ENG Draft RTRS Principles and Criteria for Consultation.

RTRS, 2008. RTRS Principles and Criteria for Responsible Soy: Field Testing Version. Document reference: GA-OUT-01.2-ENG RTRS Principles and Criteria Field Testing Version..

RTRS, 2009. Website: www.responsiblesoy.org.

Smeets, E. et al., 2004 A quick scan of global bioenergy potentials to 2050. Part B: regional bioenergy potential and an assessment of underlying variables. Copernicus Institute, Utrecht.

Smeets, E. et al., 2008. The sustainability of Brazilian ethanol- An assessment of the possibilities of certified production. Copernicus Instituut, Utrecht.

Trienekens, J. and P.J.P Zuurbier Quality and safety standards in the food industry, developments and challenges, Int. J. Production Economics 113 (2008) 107–122..

UNEP, 1999. United Nations Environment Programme.

UNICA, 2009. Public policies for ethanol – mandatory blend. Summer school Esalq, presentation by Eduardo Leão de Sousa, Unica, Piracicaba.

Williamson, O., 1996. The mechanisms of governance. Oxford University Press, New York.

Woods, J. and Diaz-Chavez, R. , 2007. “The Environmental Certification of Biofuels”. Paper presented at the OECD/International Transport Forum,. London.

Zarrilli, S. and Burnett, J., 2008. “Making Certification Work for Sustainable Development: The Case of Biofuels”. UN Conference on Trade and Development. Geneva. Switzerland. http://www.irgc.org/IMG/pdf/Wirec-Simonetta_Zarrilli.pdf.