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ORIGINAL PAPER

Global principles for sustainable biofuel production and trade

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Abstract This article examines international attempts to regulate the production of and trade in biofuels by establishing criteria and indicators and certification schemes. It focuses on the norms underlying the criteria and the community constructed on the basis of them. The theoretical approach here rests on a discussion of these norms and on their constitutive role. This role creates a community and gives an institutional basis for the global public domain. Accordingly, different norms create the network on which environmental governance is based. It is assumed that commonly accepted criteria form a common norm. The article analyses eleven criteria and indicator systems and compares the criteria adopted. Eight were created for biofuels and bioenergy and three are used in forest certification. Comparison reveals that the criterion aiming to reduce greenhouse gas emissions is used in Northern systems, whereas commonly accepted environmental criteria are biodiversity and minimization of pollution. The web of norms on which biofuel production and trade is based comprises environmental norms together with the general norm of sovereignty and the norms of the market economy.

Keywords Biofuels · Criteria and indicators · Global public domain · Governance · International norms · International (world) society · Sustainability

Abbreviations

C & I	Criteria and indicators
CSO	Civil society organization
FBOMS	Brazilian Forum of NGOs and Social Movements
FSC	Foreign Stewardship Council
GHG	Greenhouse gas
ILO	International Labor Organization
INGO	International non-governmental organization
ITTO	International Tropical Timber Organization

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NGO	Non-governmental organization
RSB	Roundtable of Sustainable Biofuel
RSPO	Roundtable on Sustainable Palm Oil
RTFO	Renewable Transport Fuel Obligation
SBA	Sustainable Biodiesel Alliance
SFM	Sustainable forest management
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

The growing price of fossil fuels and the increase in greenhouse gas (GHG) emissions arising from their use have prompted efforts to develop alternative energy sources. One of the key alternatives for fossil fuel is biofuel. The production of biofuels, however, involves a number of social and environmental problems, for example land use, the issue which comes to a head in food crises and deforestation. These call for rules as to how the production of and trade in biofuels should be arranged. This article examines the adoption and formation of international norms in bioenergy trade and production, discussing the role of such norms in global environmental governance and inquiring, in particular, how these norms are accommodated in different environmental management schemes. The focus is on sustainability norms—planet, people and prosperity (environmental, social, and economic sustainability)—and on the criteria defining these, including environmental, political, social, and economic criteria.

The article focuses on global attempts to create criteria and indicator (C & I) systems for sustainable biofuel production and trade. Analyzing the criteria devised by different governmental, non-governmental and business bodies, the article seeks to shed light on the norms on which they are based. The objective is to ascertain whether these norms create a community which regulates its members in biofuel production and trade. Answers are sought to three questions:

- What kinds of criteria are developed to regulate the production of and trade in biofuels?
- Which criteria will develop into or are already accepted as an international norm?
- Finally, the paper suggests that in environmental governance the importance lies not in one norm but in the web of norms. The question is thus, what kind of norms constitute this web?

2 Norm complex, world society, and the global public domain

A norm includes constitutive and regulative aspects. The constitutive aspect defines and makes possible the social activity which is to be regulated. This aspect has, therefore, a crucial role in establishing shared meanings. The regulative aspects have causal effects—they are intended to make participants behave within certain limits. The shared meanings which norms imply require a common identity. The strength of common identity and shared meanings therefore enforce both dimensions of a norm (Kratochwil 1989, p. 11; Checkel 1997, pp. 473–475; Finnemore and Sikkink 1998, p. 891; Ruggie 1998, pp. 871–873; Crawford 2002, p. 88).

The constitutive dimension of a norm precedes the establishment of a community. The significance of this aspect in global governance is emphasized in that global regulations may be randomly applied at the national level in many countries. This reflects a weak institutional foundation of the rules in these countries. The establishment of the institutional foundation for the rules of the game therefore become a focal starting-point.

Different kinds of rules, including legal, resemble norms. Rules are based on legal norms but differ from norms in two respects. First, contrary to a norm, the violation of a legal rule is followed by sanctions. Second, following rules does not necessarily imply shared meanings, because obedience here can be based on the fear of sanctions. Rules are therefore not always constitutive.

It has been pointed out that a rule can turn into a norm when it becomes commonly accepted as legitimate. The question is, how broadly accepted should a rule be before it can be regarded as a norm (Finnemore and Sikkink 1998, p. 892)? From the point of view of the community aspect this question is irrelevant: norm(s) construct the community (Buzan 2004, p. 8).

International norms imply an international community/society. The basic norm between interstate relations is sovereignty. The concept of governance questions the relevance of any single norm, in that governance implies the exercise of political power without a single authority or clearly defined parties. Governance includes the interaction of different interests and aims at consensus on the basis of commonly accepted norms. Beyond the norm of sovereignty the literature concerning international society/community has referred to other norms which make it possible to overcome the state-centric approach and to speak instead of international society/world society. Human rights have in this respect been crucial. In the recent literature, however, other norms in this particular context, for example liberal political and economic and developmental and environmental norms, have been increasingly discussed (Buzan 2004; Linklater and Suganami 2006, pp. 117–54; Giesen and Van Der Pijl 2006).

I refer here to Bernstein's definition of a norm complex as "a set of norms that governs relations of authority and the values promoted that define and regulate activities in a particular issue area" (Bernstein 2002, p. 6). This is compatible with the concept that environmental governance consists of different sectors, circles, and communities whose ways of thinking on the environment meet in governance. This creates both common meanings and tangential connotations which cannot focus on one norm. Different participants bring with them different norms, the contents of which are concretized in different situations. A norm complex is a web of norms which make possible the emergence of a community.

The concept of sustainable development implies the existence of a norm complex in environmental governance. In sustainable development the environmental conservation norm is attached to the normative emphasis on development discourse and to the norms of the market economy. Bernstein calls the dominating norm complex which established itself after the Rio Conference of 1992 liberal environmentalism. Liberal environmentalism includes both environmental norms and the premises of the market economy, even its neoliberal emphasis (Bernstein 2002, p. 7). According to a rough interpretation of sustainable development, environmental concerns are not the priority; the whole idea is that environmental assets be incorporated into the economic system in order to secure the sustainability of this system (Doyle 1998; Wissenburg 2001, p. 103).

Many writers on international governance argue that economic theory or certain elements of neoclassical economics possess constitutive importance (Biersteker 1992; Gill 1995; Williams 1999). The notion of sustainability is an attempt to include conservation in

these elements. The concept of sustainability is thus rather a symptom of the constitutive role of the free markets than a norm as such.

Despite the obvious role of the market economy and the doctrines of neoclassical economy, I am inclined to see the concept of sustainable development and the environmental management models based on the concept of sustainability as a hybrid of environmental, developmental and economic norms which may be mutually compatible. For example, the social sustainability stressed by developing countries emphatically underlines sovereignty as a basic norm when the countries concerned decide on their social development. A question of great importance is whether these norms or a combination of them are shared by the relevant participants in global environmental governance. What is the smallest possible denominator which creates community in environmental governance and, in this particular case, in biofuel production and trade?

The way how governance is constructed leads to two perspectives: that of the global public domain advocated by Ruggie, and the transition from international society to world society articulated by Buzan. Both of them are of particular relevance in gaining an insight into the relationship between norms and a governance pattern which is composed of state and non-state participants.

By global public domain, Ruggie means two transnational starting points: world civic activities, which stand for the transnational policies of different non-governmental and civil society organizations (CSOs—environmental, human rights, and other social organizations) and private governance, created by transnational corporations. Although the original starting points of civic activities and business have been very different, with CSOs concentrating on advocacy and private governance on business regulations, a significant merging has taken place. Private governance, where CSOs together with companies regulate public goods in the environmental, social and health sectors, are the most visible signs of the new global public domain. Ruggie defines this "as an institutionalized arena of discourse, contestation, and action organized around the production of global goods". He emphasises that the global public domain includes both non-state participants and states, and "is anchored by norms and expectations… within, across and beyond states" (Ruggie 2004, p. 519).

From the perspective of international society, Buzan suggests that the entry of non-state participants into several sectors traditionally dominated by states has created a basis for new norms in international society. The accession of the non-state sector in international society and the diversity of norms justify the introduction of the concept of world society. Buzan contemplates the possibilities of a world society, i.e. a public sphere where common norms are shared by states, international organizations and non-governmental organizations, and private persons. Thus Buzan comes close to the concept of a global public domain in pointing to the economic sector as a space for establishing globally shared meanings and common norms (Buzan 2004, pp. 77–87). Thus world society, understood as a public sphere, strips off some of the progressive glamour attached to the concept of global civil society. It is not merely a place where the counter-arguments of capitalism are generated, but rather a space where consensus is found on the norms underlying governance.

The concept of the global public domain seems to lay more emphasis on the participants than on norms. This, however, does not reduce its usability in the present study but helps to locate the community which is based on consensus of governance. This article focuses on the green public sphere and its realization in different C & I systems in the context of bioenergy. The green public sphere is a composite of different environmental, political, and economic approaches with minimum consensus on the conditions of governance

(Torgerson 2006, pp. 724–727). The following analysis seeks to clarify the norm-complex by which the community pertaining to bioenergy is constructed.

3 Norms, principles, criteria and indicators in environmental management

The C & I systems have been created in order to concretize the principles of sustainable development. The most advanced C & I systems have been in sustainable forest management (SFM). The C & I systems in SFM have been examples for developments in the biofuel sector.

The SFM principles concerning environmental, social and economic sustainability are repeated in the criteria which national and international bodies have set for SFM. The organizations which set these criteria represent communities involved in forest governance. Among these communities, criteria are thus norms. There are several criteria-setting bodies in forest management, and the overlapping criteria between these bodies indicate a broader community. For example, in SFM a commonly accepted criterion is the preservation of biodiversity. Such intersecting criteria, which appear in most systems, can thus be regarded as norms of SFM.

Criteria resemble norms in that they are formulated on the basis of minimum consensus and are in this sense shared meanings. In the first place criteria are standards which define the contents of sustainability principles. However, they are not automatically norms. The principles of sustainable development result in the possibility of different interpretations on the standards as the Pan-European criteria and the International Tropical Timber Organization's (ITTO) criteria show (The Pan-European Forest Process 2007; Improved Pan-European Indicators 2003; ITTO 1998). Criteria may have constitutive and regulative aspects within a particular system, but this is not necessarily the case between different systems.

Indicators express the way criteria are achieved (The CIFOR Criteria and Indicators 1999, p. 8; Prabhu et al. 1996, p. 14; ITTO 1998, p. 3).[1] The criteria and indicators of environmental management are interesting in the context of the public domain: they refer on the one hand to the governance mechanisms of public authorities, such as the laws on forest management and on the other to the private sector's production and quality standards. In forest management and in the processing of forest products several C & I and forest certification schemes have been created by different private bodies, both producers and consumers, industrial and non-governmental organizations. Despite the common principles of sustainability, harmonization of these schemes seems to be difficult, reflecting the socio-economic and physical differences between countries. The certification schemes which apply these criteria have diverged in developed countries into competing systems seeking to maximize their share in the certification markets (Cashore et al. 2003, 2007; Guldbrandsen 2005).

According to constructivist theory, norms are established in interaction. Therefore the development of criteria into norms suggests an interplay between different participants, for example in the context of certification schemes. The various technical, economic, environmental and social criteria embodied in the same certification scheme reflect this

[1] There is non-uniformity in the terminology used by different C & I and certification systems. The FSC and RSPO certification schemes use principles instead of criteria, and criteria instead of indicators. According to the FSC definition a principle is an essential rule or element, while a criterion is a means of judging whether or not a principle has been fulfilled. See *FSC International Standard*, pp. 11, 13.

interplay between different interest groups. Accordingly, commonly accepted principles and criteria can turn into norms between groups participating in certification and also among those consumers who accept certification (Pattberg 2005). The combination of members which compile the C & I systems implies the possibility of a global public domain. However, in these cases considering criteria to be norms may be artificial. They may be norms in certification schemes, but may not be relevant outside the system. The somewhat restricted scale of these systems emphasizes this. The main interest here concentrates therefore on a comparison of criteria between different C & I systems. Similarities and differences reflect whether these criteria constitute or may develop into global norms.

4 Biofuels: sustainability criteria and the limits of community

4.1 The C & I systems and the global public domain

The following analysis examines eleven C & I systems, eight of which are created for bioenergy while three are examples of the C & I systems used in SFM. They represent C & I systems devised for developing countries (ITTO and Brazilian Forum of NGOs and Social Movements, FBOMS) for developed countries (Cramer Criteria, Pan-European, RTFO, SBA and WWF-biomass), and for both developing and developed countries (FSC and RSB). RSPO and the Basel Criteria deal with production in developing countries, but the production chains equally involve the developed countries. Two of these are in use in different certification schemes (ITTO and Pan European) and two are active certification schemes as such (FSC and RSPO) (see Table 1).

The C & I systems touch upon the world society and global public domain concepts in two respects: the members of C & I systems constitute a global public domain by connecting state and non-state participants together and the common criteria enforce norms and enable interaction between state and non-state participants and thus constitute world society.

In examining the first aspect in current C & I systems, two types of participant stand out: non-governmental organizations (mainly environmental) and governments together with other state organizations. Governments and inter-governmental organizations are the main initiators in four schemes, and state organizations participate in six schemes examined. Two schemes, Pan-European and ITTO, are the products of intergovernmental cooperation. Besides this, many non-state (forest) certification schemes have adopted their C & I systems. Nevertheless, (environmental) non-governmental organizations play pivotal roles in initiating and in participating in these schemes. In fact, they have no role in only two intergovernmental schemes, ITTO and Pan-European.

Most interesting from the viewpoint of the global public domain are the cases where all the participant groups are represented, including governments, civil society organizations, and business—producers, industry and retailers. Two recent C & I systems are interesting in this respect. Both of these, the Sustainable Biofuel Alliance (SBA) based in the USA and the Roundtable on Sustainable Biofuels (RSB), released their C & I schemes, Baseline Practices for Sustainability (SBA) and Global Principles and Criteria for Sustainable Biofuel Production, Version Zero. Both drafts are to be completed by public review (SBA) or by global stakeholder feedback (RSB). This openness of the process whereby principles, criteria, and indicators are defined and the possibility of forming common norms is established, superimposes on the green public domain.

Table 1 Origins, sponsors, and members in C & I schemes[1]

	Initiated by:	Global origin	Members
FSC[2]	Ns	North–South	I, Ns, Ps, R
ITTO[3]	Gs	South	Gs
Pan European[4]	Gs	North/regional	Gs
Basel criteria[5]	N/R	North	I, Ns, R
Cramer criteria[6]	G	North/national	G, Ns
FBOMS[7]	N	South/national	N
RSB[8]	N	North–South	G, I, IO, Ns, Ps, R
RSPO[9]	N	North–South	I, Ns, Ps, R
RTFO[10]	G	North/national	G, Ns
SBA[11]	Ns	North/national	G, Ns, Ps, I, R
WWF-Biomass[12]	N	North	N

[1] Abbreviations: G, government; I, industry; IO, international organization; N, NGO; P, producers; R, retailers

[2] FSC International Standard (1996)

[3] ITTO (1998)

[4] Improved Pan-European Indicators for Sustainable Forest Management (2003)

[5] The Basel Criteria for Responsible Soy Production (2004)

[6] Cramer Commission (2006)

[7] FBOMS (2006)

[8] RSB—Roundtable of Sustainable Biofuel (2008)

[9] RSPO—Roundtable on Sustainable Palm Oil (2007)

[10] RTFO—The Renewable Transport Fuel Obligation (2006)

[11] SBA—Sustainable Biodiesel Alliance (2008)

[12] WWF-Biomass (2007)

What is the significance of these activities from the point of view of international norm evolution? The comprehensiveness of the SBA scheme, for example, does not promote the emergence of a new norm complex if it does not gain a sufficient share in biodiesel production and trade. Moreover, the SBA baseline practices operate on the national level and thus do not have a similar connection to the global public domain as for example, RSB, the starting-point of which is global. RSB's Zero Version was created by North–South consultation, including producers, business, and expertise groups, together with civil society and environmental organizations. Besides this, its steering committee includes these participants together with representation of the Swiss government and the UN Environmental Programme.

It seems that RSB has managed to form criteria which enjoy broad geographic and social acceptance, as they are formulated by the participants of different sectors, including transnational companies and NGOs in both developed and developing countries. However, the indicators have not yet been published and the application of criteria in certification schemes or in different directives is obscure. Hence, reference can be made to the SFM C & I systems which have been used in forest certification. Although a major motive for forest certification was to stop tropical deforestation, the great majority of certified forests are boreal and not tropical, indicating that the SFM criteria have been broadly accepted as norms in developed countries but not in developing and emerging countries. The situation

is parallel in business-led and NGO-led certification. It is therefore possible that a similar development takes place in biofuel certification. Accordingly, certified fuels are used in and imported to developed countries and uncertified biofuels are sold on the markets of developing countries. The membership and the participants in C & I systems thus reflect rather the possibility of the emergence of a (global) public domain than to its actual existence.

The only active C & I system in use in biofuel production and trade is RSPO. RSPO is both a C & I system and a certification scheme. It was established at the initiative of WWF and there are certain similarities with FSC's C & I system. However, the presence of business in RSPO is much stronger than in the FSC, in which environmental and social organizations have dominating roles. In RSPO the transnational companies, particularly in industry and the retail trade, have had an important role from the very outset. Similarly, the palm oil producers (growers, mills, and export companies) are strongly present. A geographic balance is assured by locating RSPO's seat of associations in Zurich and the secretariat in Kuala Lumpur. Nevertheless, no balance similar to that in the business sector exists in civil society organizations. WWF occupies a central position and other big international environmental organizations and state-sponsored NGOs are well represented, but there are only few local NGOs. This indicates a strong position of business and INGOs in RSPO and very likely the situation where the criteria are created by business and big INGOs.

Despite the market presence of non-state participants in these schemes, the role of the states is obvious. There are purely government-initiated C & I systems in the field of biofuels, although the participation of non-state participants is strong in the Dutch government's system (Cramer criteria), and private participants or civil society organizations may have a consultative role as in the British Department of Transportation's proposal (RTFO). In most cases, the states' role is strong, although they do not participate in the system as these systems are developed to control the side-effects of regulations, standards and rules concerning bioenergy made by governments.

4.2 From criteria to environmental norms

The second aspect of world society and the global public domain turns analysis of the criteria applied in different C & I schemes in another direction. The point of departure is that common criteria may develop into common norms and the web of these norms creates a community. If the norms are accepted globally, this web is a reflection of world society/the global public domain.

The initiative of devising criteria and indicators for biofuels originated in the rising demand for renewable energy sources. Although the EU's decision to increase the share of biofuels is greatly emphasized in recent reviews, Brazil has longer experience in the attempt to increase the use of biofuels in the energy consumption. The government has subsidized biofuel production since the mid-1970s and biofuel legislation moved the Brazilian vehicle fleet to use bio-ethanol. The legislation laid down in the 1990s was completed by the National Program on Biodiesel Production and Usage, and the subsequent law (2005) requires that 2% of fuel consumption be replaced with biodiesel (Colares 2008, pp. 102–103).

Originally the Brazilian biofuel policy was devised to reduce dependence on imported fossil fuels, but it soon acquired economic and social objectives. The government established conditions for industrial producers of biodiesel to purchase feedstock from family

farmers in order to guarantee their income level. This social inclusion in regional development has been an organic part of Brazilian policy. The GHG emission reductions followed after these economic and social considerations (Ministry of Mines and Energy 2008; Stattman et al. 2008).

The GHG emissions have been the focus of European discussion on biofuels (Leawandowski and Faaij 2006, pp. 83–84). The EU decision to gradually replace fossil fuels with less GHG-intensive sources is mainly discussed with regard to climate change. The EU adopted directives on renewable energy sources (Commission of the European Communities 2008) and the use of biofuels (2003). The latter aims to replace 5.75% of all transport fossil fuels with biofuels by 2010 and 20% substitution of fossil fuels by biofuels by the year 2020 (Directive 2003/30/EC). The main justification for both directives was to reduce GHG emissions, and in the case of the biofuel directive, in fact, it is the sole premise.

In the USA, the link between the demand for biofuels and climate change has not been so obvious as in Europe. Despite attempts in the private sector and decisions in different US states, the negative attitude of the Bush administration, supported by the Senate, towards mandatory GHG reductions has weakened the connection between biofuels and climate change in the USA (Selin and VanDeveer 2007). Biofuels have thus been seen merely as an alternative fuel to alleviate demand and reduce the price of fossil fuels. However, political change after the 2006 general elections, and recent discussion in the USA in the media and in the Congress concerning particularly on the Energy Independence and Security Act of 2007 indicates that the climate change and GHG emissions have emerged as a crucial issue in the debate on renewable energy sources and biofuels. The new legislation set no quantitative portion to the use of biofuels but did set targets for an increase in the production of biofuels. This, however, included a provision in ensuring that the production of biofuels helps to reduce GHG emissions. The new law requires that conventional biofuels should produce 20% less lifecycle GHG emissions compared to fossil fuels, and contains protections to ensure that an increased use of biofuels will not cause any other environmental harm (The Energy Independence and Security Act 2007, pp. 28–58; The US Senate 2007).

Reduction of GHG emissions by moving away from fossil to biofuels is, however, not as simple a matter as it might seem. Despite low emissions in the use of biofuels, the GHG balance of biofuels vis-à-vis fossil fuels may be negative when the whole production chain is taken into consideration (Kojima et al. 2007, pp. 18–20; Doornboch and Steenblik 2007; Greenpeace 2007). This is well perceived both in the recent US energy bill and in the EU regulations. From this perspective, then, a GHG balance including the whole production chain is a crucial criterion and driving force in developing a certification system for biofuels.

These systems do not focus solely on GHG issues. First of all, agroenergy, or the first-generation biofuels, which can be used equally as food and as fuel, involves a variety of viewpoints. Agrofuels compete with other crops in cultivation areas and with other kinds of land use, particularly with forestry. This may affect food security in poor developing countries, when the demand for energy may reduce cultivation for food and increase its price. Second, change of land use to energy production may harm biodiversity and alter the whole ecosystem, particularly when forests are turned into monoculture plantations. Third, the production of agrofuels is labour-intensive and labour conditions thus constitute a more important issue than in the production of fossil fuels (Kojima et al. 2007; Zarrilli 2006). As the major part of agrofuel crops is still used in food production, the existing criteria for the main sources of first-generation biofuels, soy beans, and palm oil (Basel Criteria and

RSPO)[2] seem not to concentrate on the GHG balance and comparison of emissions with fossil fuels (Table 2).

The development of a certain norm is a result of interaction between different participants, and the inclusion or exclusion of certain criteria in a C & I system reflects the norms behind the system and the possibility that the principle/criteria might develop into a norm. The GHG balance/carbon storage/carbon cycle as an environmental criterion prevails only in European C & I systems and the US SBA. It has a crucial place in the Pan-European SFM principles established in 1994, and it is one of the main principles in recent biofuel C & I systems (Cramer Criteria, RSB, SBA and WWF-biomass). In Pan-European SFM principles, the global carbon cycle is one of the four environmental criteria and its indicators are carbon storage, growing stock, general capacity, and use of forest areas. Its general principle is that the global carbon cycle does not increase GHG emissions, but the criteria also do not bind their reduction by forest management. Similarly, the SBA draft for baseline practices does not define the extent of GHG reductions but states that "[s]ustainable biodiesel shall result in significantly lower GHG emissions compared to fossil fuels when analyzed via a lifecycle assessment", therefore "[f]ossil energy used in growing, transporting and processing biodiesel must be considered" (SBA 2008).

The EU decision that the minimum GHG emission reduction for biofuels should be 30% less than for fossil fuels has an effect on the development of the GHG criterion (WWF-biomass, p. 61). In the European biofuel C & I systems there are several options whereby the carbon emissions of first-generation biofuels should be 35% less than in fossil fuels and second-generation biofuels 50 to 70% less than fossil fuel emission (Cramer Commission 2006, pp. 13–14). WWF-Biomass pays attention to the whole supply chain, but emphasizes that even implementation of global biomass certification is necessary in order to reduce GHG emissions, the prime urgency being to define a GHG tool which is internationally accepted as the criterion for biomass. This bypasses other environmental and social criteria (WWF-biomass 2007, p. 67).

The carbon balance is not totally ignored in other C & I systems and certification schemes, although it does not feature as a sustainability principle or criterion. References to ground carbon stocks (land use change from dense forest system) and below-ground carbon stocks (avoid planting and draining peat soils and steep terrains) point to the GHG balance (WWF-biomass 2007, pp. 15, 22–25). There are environmental indicators in the FSC and the RSPO schemes and in the Basel Criteria which are similar to those of the GHG criterion, for example land use change (FSC), and in the optimum practices for growers and producers or in the development of new planting (RSPO). However, these schemes make no reference to the GHG balance and do not define indicators for the carbon cycle. Owing to the vagueness on this matter, carbon emissions have not been the main concern in these schemes. This constitutes an interesting reflection of state-level policies and attitudes to climate change. All these C & I systems have strong interests in developing countries, which emphasise the main responsibility of the developed countries for climate change. The absence of GHG criteria in these systems suggests that state-level policies direct developments at the private level, both in business and in civil society. This indicates also that the GHG criterion has not developed as a norm in the global public domain, although it can be considered as a norm in a smaller community.

To apply the GHG criterion to agrofuels involves a political issue connected to production. Because over 70% of agrofuel plants are used for food production, to draw a line

[2] Only 18 per cent of soybean production is used for oil—food and fuel (Kojima et al., p. 70)—and 80 per cent of palm oil is used in food production.

Table 2 Sustainability principles and criteria

	FSC[1]	ITTO	Pan-European	Basel criteria	Cramer criteria	FBOMS	RSB	RSPO	RTFO	SBA	WWF-Biomass
Planet											
GHG	–	–	X	–	X	–	X	–	X	X	X
Plantation (forest) health	–	X	X	X	–	–	–	X	X	–	–
Soil, water & waste	X	X	X	X	X	X	X	X	X	X	X
Biodiversity	X	X	X	X	X	X	X	X	X	X	X
People											
Compliance	X	X	X	X	–	X	X	X	–	–	X
Human rights	–	–	–	–	X	–	X	–	X	–	X
Indigenous peoples' rights	X	–	X	–	–	–	X	–	–	–	–
Labour relat. & conditions	–	X	X	X	X	X	X	X	X	X	X
Social inclusion	–	X	X	X	X	X	X	–	–	X	–
Food security	–	–	–	–	X	X	X	–	–	X	–
Technology & education	–	–	X	–	–	X	–	–	–	–	–
Participation	X	–	–	X	–	X	X	X	–	X	X
Prosperity											
Management	X	X	X	X	–	–	X	X	–	X	–
Property & users' rights	X	X	X	X	X	X	X	X	X	X	–
Transparency	X	–	X	X	X	X	X	X	X	X	–

[1] See references in Table 1

between their use as energy and as food is difficult. Application of the GHG criterion to food production will be unfeasible in both developed and developing countries.

All C & I systems have included general environmental management guidelines concerning soil, water and waste among their principles and criteria. Similarly the maintenance of biological diversity is a commonly accepted principle in C & I systems and bioenergy certification. Both the Pan-European and ITTO forest management Criteria and Indicators and non-governmental certification systems such as the FSC include biodiversity as a central concern in forest management. Similarly, both RSPO and the Basel Criteria make reference to biodiversity. The expansion of palm oil plantations in Malaysia and Indonesia has been seen as a danger to the entire ecosystem (draining peat soils) and as a threat to particular species, such as the orang utan (Buckland 2005). Hence, as palm oil production and cultivation resembles forest management in forest plantations, and as palm oil plantations are based in tropical (forest) areas, the RSPO have criteria of biodiversity similar to those of the FSC.

The central role of protecting biodiversity as an environmental principle is supported by international conventions. The Convention on Biological Diversity 1992 assumes that both developed and developing countries are committed to this principle. To preserve certain regions as protected sectors among production areas, probably with biodiversity corridors, this environmental principle is relatively easy to realize and monitor. Supported by the preservation norm, international organizations, international NGOs and transnational companies have found a common interest in fulfilling environmental obligations (Duffy 2006).

4.3 Social and economic criteria: seeking for common norms

Social sustainability is included in all C & I systems. It reflects the demands of developing countries for global sharing of the burdens of environmental sustainability. It also touches upon sovereignty and the interests of the producer countries when deciding on environmental conservation. The sovereignty norm is clearly emphasized in the criterion of regulatory compliance. This means that C & I systems and certification schemes have to be compatible with national legislation, implying that the indicators should be moulded to local conditions, laws and regulations.

Except for the Cramer Criteria and SBA, compliance is included in all systems and schemes examined here. Another common regulator in social sustainability are the criteria and indicators concerning labour relations and conditions. Despite the fact that these issues have been connected to trade disputes between developed and developing countries, the systems have referred to International Labor Organization (ILO) regulations and national legislation. These criteria, similarly to those of biodiversity, rest on international agreements and the sovereignty principle, a fact which indicates a common understanding and an established norm.

However, (particularly non-governmental Western) C & I systems have introduced criteria which reflect liberal political norms such as human rights, minority protection (indigenous peoples' rights) and participatory procedures. These social sustainability criteria divide purely Western C & I systems from those in which the participation of developed countries is apparent. Human rights and indigenous peoples' rights appear as a criterion in only four Western C & I systems, although the relevance of indigenous peoples' rights, for example in palm oil and soy bean cultivation and production, is difficult to call into question. Participatory management procedures with workers and stakeholders, emphasized in many international organizations' and donors' policies, have emerged as a

criterion in Third World C & I systems and certification schemes. They also reflect the development policies and practices of international organizations and donors.

Interesting exceptions in the social inclusion criteria are SBA and RSB, the emphasis of which is on food security, local communities and local consumption. This may be attributable to the members of these systems, as in SBA NGOs, small companies and farmers are well-represented and as RSB is based on North–South consultation. Hence, they have affinity with Brazilian FBOMS, which emphasises local use and consumption of bioenergy. FBOMS is an initiative of a national NGO, Friends of the Earth, and it follows and responds to the Brazilian government's biofuel agenda.

The last sustainability principle, economic sustainability or prosperity, seems to acquire more coherent content in the debate. Nevertheless, there are differences in the emphasis on economic sustainability between developed and developing countries, non-governmental organizations and international organizations and donors. The main distinction centres on the concepts of economic profitability/viability, referring on the one hand to the market economy and on the other to the possibilities of local communities in economic development. For agrofuels, the question focuses on food security and displacement effects in particular and on the role of market regulations in general.

Although the effect on food security and displacement is intensively debated, it has appeared in only four C & I systems, of which none is operational. UN agencies and the Third World NGOs have warned that the demand for biofuels would raise the price of food and endanger the food supply in developing countries (FAO 2008; Padilla 2007). The demand itself comes from the developed countries, which are turning their cultivated areas to energy use, causing a rise in food prices globally. This same demand also turns cultivated areas in developing countries from food production to energy production, and accelerating deforestation. The demand here is, moreover, not only for land, but for other production resources such as water (Sustainable Bioenergy 2007).

To what extent are C & I systems able to secure food security to the Third World's energy-producing countries? It has been suggested that the trade in biofuels and the mechanisms regulating it are new forms of colonialism (Padilla 2007). Most critical Third World movements have pointed out that sustainability calls for food sovereignty instead of food security (Doherty 2006, p. 869). Whether this interpretation is the best way to characterize the issues in bioenergy production and trade is a matter of debate. In any case it sheds light on the normative aspects involved in dividing the burden of sustainability, and prompts considerations similar to those by which the developing countries have refused to take part in the GHG limits.

There are criteria for food security and the displacement effect in four of the C & I systems examined here. They do not appear in the only working biofuel certification scheme, the RSPO, although some indicators function in the same way. Interestingly enough, two recent systems, SBA and RSB lay particular emphasis on food security, indicating that this development criterion is strengthening and may attain normative status globally.

It is nevertheless equally interesting to examine another facet of economic sustainability—economic profitability. It is held that the essential content of sustainable development is the attempt to adopt environmental conservation in the market economy. The voice of the Third World on economic sustainability may point elsewhere, towards more comprehensive and equal development. Similarly a general management criterion can be interpreted as a general sustainability criterion and not as synonym for the market economy. Nevertheless, there are criteria which clearly have reference to the rules of the market economy.

This is quite to be expected. Though the C & I systems are not necessarily bound to the economic system, certification schemes are part of the market economy. Environmental certification is based on individual consumers' choices on the markets and active certification schemes involve private players on the part of both producers and consumers.

The most important economic criterion here is that pertaining to property and users' rights. It therefore comes as no surprise that this criterion is included in all C & I systems and certification schemes. The definition of property and users' rights is not only the justification for private property, but an essential precondition for functioning markets in the neo-classical economy. Similarly this is according to neo-classical environmental economics the most efficient means of environmental conservation, as the producers seek to satisfy consumers' demands.

There is a reverse side to the definition of property and users' rights. In the developing countries the use of land and forests is based on the tenure system and the state grants commissions to companies and to farmers without consulting the original land users. Thus the definition of property and users' rights is directed—as well—to protecting the rights and livelihood of local and indigenous people. Hence this basic principle of liberalism is also used to advantage for development purposes.

5 Conclusions and discussion: biofuels and global norms for environmental governance

The foregoing examination has scrutinized the nature of sustainability criteria in different C & I systems and certification schemes. It gives a broad picture of the possibility of finding globally accepted criteria in the biofuel trade and production in particular, and the possibility of moulding common norms in environmental governance in general. The starting point of the analysis was that governance is based on a web of norms—a norm complex—and not on any single norm.

As suggested, interaction between different participants in C & I systems and in certification schemes in particular may make for a common understanding of the norms of environmental governance. The foregoing review reveals how different systems converge and how they differentiate. The analysis of the initiators, origins and members of the C & I systems sheds some light on the relationship between the participants and criteria. This makes it possible to contemplate the chances of the existence and form of a global public domain. The structure of the systems shows that the composition of the members stands for the global public domain, but nevertheless comparison between the systems indicates its frailty. The geographical and national origins seem to explain more the criteria and their content than the public/non-public division.

The review does not focus on the interaction among different participants in the context of C & I systems. For this, an active certification scheme should be examined, and at the moment there is only one such, the biofuel certification scheme RSPO. An analysis of the interaction in the RSPO and in forest certification schemes would shed light on the adoption of norms in interaction.

While the analysis of the structure of C & I systems illuminates the possibility of a global public domain in norm building, the comparison of C & I systems brings out the global norm complex. How deep this complex is, is a reflection of the nature of the world society.

Although reduction in GHG emissions has been an important starting point in the debate on biofuel certification and definitely the most important trigger for the European

discussion, it does not have an unambiguous role in all C & I systems. In some schemes, it is not even mentioned as a criterion, and it is difficult to find any indicators which touch upon the carbon balance in these systems. The GHG balance does not feature in the criteria evolved in developing countries or criteria focussing on production processes in these countries. This suggests two things. First, in the UNFCCC, developing countries have no obligations to reduce their GHG emissions. This general point seems to be reflected in C & I systems. Second, the C & I systems which are relevant for developing countries are concerned with agrofuels. Application of the GHG criterion to agrofuels is difficult owing to similarities with food production. Owing to the fact that the carbon balance features only in the European C & I systems and SBA, the reduction in GHG is clearly not a commonly accepted norm.

The analysis of different schemes sheds light in this respect on public/private or governmental/civil society relationships. Interestingly, there would seem to be strong bonds between the general policies of developed and developing countries and the criteria in the C & I systems reflecting their origin, despite their non-governmental nature. Although the systems may include new environmental, social and economic ideas, the connections with governmental delineations remain strong. This reflects the role of the state and international relations in norm evolution and adaptation.

Three general principles of sustainable development—the three Ps—are present in all C & I systems. However, the criteria governing the way they are to be achieved vary, which would imply different norms underlying them. Nevertheless, in all principles some common criteria can be found. In environmental sustainability some kind of general concern to avoid pollution (soil, water and waste) is included in all. Similarly the concern to protect biodiversity is included in all schemes.

The content of social sustainability is diffuse. The European schemes emphasise human and indigenous peoples' rights, while the C & I systems focussing on producer countries in the South emphasize more general development criteria such as participatory approaches and social inclusion. An exception to all of these is SBA's and FBOMS's emphasis on local production and the use of biofuels.

Interestingly enough, the general norm of international relations, sovereignty, stands out. All the systems (except the Cramer Criteria and SBA) emphasize compliance with national laws and the criterion of labour conditions defined by the ILO.

As a general notion, the development of biofuel C & I systems is dominated by the state structure of international relations, the market economy and those environmental viewpoints on which international consensus rests. Hence, these starting points comprise a vague norm complex for a common global C & I system. This would also suggest the weak normative basis of world society to an extent that this concept can be used only with reservations. It therefore comes as no surprise that the governance of biofuel production and trade is constructed on the established norms of the international community: the general conservation norm (minimize pollution and loss of biodiversity), the sovereignty norm and the market norm (property rights and transparency). Similarly, particularly salient is the diversity of non-state participants in their environmental objectives, which means some concern as to the possibilities of a global civil society in environmental governance. In order to enforce a global norm complex and an extensive C & I system, intensive state-to-state cooperation and international agreement on climate change is still needed.

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