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Can Supply Chain Initiatives Reduce Deforestation?

A comparative analysis of cases from Brazil and Indonesia

Karen Meijer

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Abstract

Deforestation and forest degradation account for 12-15% of global greenhouse gas emissions. The largest driver of deforestation is the conversion of land for agriculture, the produce of which is for a large part traded internationally. In the absence of formal regulations, private sector initiatives have been established to reduce deforestation in supply chains. It is important to understand to what extent these supply chain initiatives can effectively reduce deforestation in order to develop public policies at national or international level that can facilitate or complement the private initiatives. This discussion paper contributes to addressing this issue by analysing the functioning of supply chain initiatives to reduce deforestation.

The paper presents a framework of factors influencing the effectiveness of voluntary supply chain initiatives based on the literature available. Using this framework, four supply chain initiatives to reduce deforestation for major commodity production are qualitatively assessed and compared for their functioning in the context of a specific country. These initiatives are: the Roundtable on Sustainable Palm Oil (RSPO) in Indonesia, the Roundtable on Responsible Soy (RTRS), the Soy Moratorium and the Cattle Agreement (all three in Brazil). The RSPO and RTRS are certification schemes, to which farmers can voluntarily comply in exchange for the possibility of receiving a price premium or of selling credits. The Soy Moratorium and Cattle Agreement are moratoria, to which compliance by farmers is also voluntary, but where non-compliance would result in being taken off the list of suppliers of major processers and traders.

Compared to certification schemes, the two moratoria have stricter and clearer criteria regarding the reduction of deforestation, which allow for monitoring and enforcement and low leakage (the displacement of deforestation to other areas, or by others) within the area under the moratorium (in this case the Amazon). The moratoria have had high implementation rates, resulting from the dependence of farmers on the parties who established the moratorium. While demand for sustainable products is often considered the major driving force for more sustainable production, in the case of soy, this demand was not sufficient to lead to high adoption of the RTRS standard. At the same time, the reputational risk that large soy processers and traders perceived when being exposed by NGOs, has effectively led to a reduction in deforestation in the Amazon region. The high effectiveness of the moratoria has been attributed to the combined activities of NGOs, supply chain actors, national governments and international governments.

The two certification schemes both contain ambiguous criteria, banning the clearance of certain types of forest, which cannot be unambiguously assessed and may lead to the clearance of other forest areas which are also important from a climate and biodiversity perspective. Different reasons are given for the low implementation of the certification schemes: Brazilian soy producers appear to think that existing laws suffice, while for the RSPO the low price premium may be the reason for low compliance. It is not clear in any of the initiatives what the technical and institutional possibilities are for farmers to expand production with reduced or no deforestation and, in relation to this, what the costs and incentives are to comply.

Leakage remains a major risk related to voluntary supply chain initiatives. Supply chain initiatives can only be effective if they have high sector participation and full spatial

coverage. Demand for sustainable production is important, although exposure seems to have been key for the moratoria. Technical and institutional possibilities for farmers to expand production without deforestation or with reduced deforestation are not well understood. It is important to understand the individual decisions at the various different levels in order to develop public policies that can facilitate or complement the supply chain initiatives.

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Bonn, December 2014 Karen Meijer

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Abbreviations

AB	Accreditation body
ABIOVE	Brazilian Vegetable Oil Industries Association
AFOLU	Agriculture, forestry and other land use
ANEC	National Grain Exporters Association (Brazil)
CB	Certification body
cm	Centimetre
CPO	Crude palm oil
CSPO	Certified sustainable palm oil
EU	European Union
FC	Forest Code
FSC	Forest Stewardship Council
GHG	Greenhouse gas
Gt CO2eq/y	Gigaton carbon dioxide equivalent per year
ha	Hectare
HCV	High conservation values
IPCC	Intergovernmental Panel on Climate Change
ISPO	Indonesian Sustainable Palm Oil
LR	Legal reserve
m	Metre
Mha	Million hectares
MSC	Marine Stewardship Council
NGO	Non-governmental organisation
RED	Renewable energy directive
RSPO	Roundtable on Sustainable Palm Oil
RTRS	Roundtable on Responsible Soy
WWF	World Wide Fund for Nature

1 Introduction: the need to understand voluntary initiatives to reduce deforestation for agricultural production

Deforestation and land use change play an important role in global greenhouse gas (GHG) emissions. Worldwide, 20-25% of greenhouse gas emissions are estimated to originate from agriculture, forestry, and other land use changes (IPCC 2014).[1] Deforestation and forest degradation account for 12% of global greenhouse gas emissions. If drainage and burning of peat are included another 3% can be added (Van der Werf et al. 2009). Globally, 4-5 million ha are lost per year (0.1-0.15 % of the global forest cover). About half of this deforestation takes place in just two countries: Brazil and Indonesia (FAO 2014). Brazil has a forest area reduction of around 2 million hectares per year and Indonesia of around 700 thousand hectares per year.

Demand for timber and agricultural products are the main global driving forces for deforestation and forest degradation (Eliasch 2008). Kissinger / Herold / De Sy (2012) identify commercial agriculture as dominant in the majority of developing non-Annex I countries. According to Cuypers et al. (2013), 55% of the 182 million hectares (Mha) deforested land for which they could identify a deforestation cause (leaving 57 Mha 'unexplained') can be assigned to conversion of land for crop production, livestock rearing and logging (Cuypers 2013). Rautner, Legget and Davis (2013) identify palm oil, soy, beef and leather, and timber, pulp and paper, as the major goods for the production of which deforestation takes place. The World Economic Forum (2014) refers to these as the 'big four'. For each of these, considerable amounts are traded internationally, for example for palm oil around 50% and for soy around 35% of total production. Cuypers et al. (2013) estimated that globally 33% of deforestation embodied in crops, and 8% of deforestation embodied in livestock products is traded between regions.

In the absence of well-enforced public policies and regulations to reduce deforestation, voluntary initiatives have been established to reduce deforestation in relation to the production of consumer goods. Various actors are involved in the supply chain, from the primary production of crops and livestock rearing to the actual consumers of the goods. Typically one can identify farmers, processers, traders, consumer-goods manufacturers and retailers. Many products because of which deforestation takes place are exported to markets that are concerned about negative environmental effects. Through the supply chain, consumers and actors further down the supply chain can influence the production processes. These initiatives are referred to in this paper as supply chain initiatives. For most of the commodities that are connected to large-scale deforestation, such initiatives are currently available or are in the process of being established. In order to further reduce deforestation and to develop effective public policies to curb it, it is important to understand whether supply chain initiatives are likely to have a significant impact on deforestation and how the functioning of voluntary supply chain initiatives can be enhanced.

The processes of the establishment of these voluntary supply chain initiatives, and their effectiveness, have been discussed in the literature for palm oil, soy and cattle ranching.

1 Of the global 49.5 gigatons of carbon dioxide equivalent per year (Gt CO_2eq/y) in 2010, 10-12 $GtCO_2$eq/y come from agriculture, forestry and other land use (AFOLU). Within the AFOLU group, land use change and forestry accounted in the period 2000-2009 for a little under 4 $GtCO_2$eq/y, drainage of peat and peat fires for around approximately 1 $GtCO_2$eq/y. Others, approximately 5 $GtCO_s$eq/y is mainly due to various agricultural practices and agricultural crop residues.

Walker et al. (2013) and Rautner, Legget and Davis (2013) discuss the characteristics of various demand-side and supply chain initiatives, challenges and further measures for various supply chains. While the journal and grey publications available contain valuable information on the effectiveness of initiatives to reduce deforestation and discuss various factors contributing to or hampering the effectiveness, a structured and comparative analysis is not available. Newton, Agrawal and Wollenberg (2013, 1) stress the need for, and lack of, *"comparative analysis across commodities, cases and countries"*. By conducting a comparative analysis of four private sector initiatives: the Roundtable on Sustainable Palm Oil (RSPO), the Roundtable on Responsible Soy (RTRS), the Soy Moratorium, and the Cattle Agreement, this paper aims to contribute to an increased understanding of the effectiveness of such initiatives under various different circumstances.

The main research question this paper aims to answer is therefore: What factors determine the effectiveness of supply chain initiatives to reduce deforestation?

Chapter 2 elaborates on supply chain initiatives and discusses the assessment of their effectiveness and factors influencing this effectiveness, leading to a framework for analysis of supply chain initiatives. Chapter 3 presents the qualitative comparative case study approach adopted in this paper. Chapter 4 and 5 assess and compare the four selected initiatives. In Chapter 6, the generalisability and future of supply chain initiatives is discussed. Chapter 7 offers conclusions.

2 Supply chain initiatives

2.1 Definition of voluntary supply chain initiatives

For this paper, voluntary supply chain initiatives are understood as initiatives that are standards for production, developed either publicly or privately, to which companies voluntarily comply. While Henson and Humphrey (2010) distinguish between four types of standards in relation to the private sector, based on whether they have been publicly or privately developed and whether they are voluntary or mandatory, for the research presented in this paper only the voluntary standards are relevant. Pattberg (2007, 52) uses the term 'private governance' for

> *a form of socio-political steering, in which private actors are directly involved in regulating – in the form of standards or more general normative guidance – the behavior of a distinct group of transnational actors, including business and, in a wider understanding, also public actors such as states.*

Since the focus of this paper is on reasons for companies to voluntarily adopt these standards, *who* has set the criteria is relevant only to the extent that participation in the development is a factor in its effectiveness, by creating greater support and capacity for implementation.

Standards can be a certification scheme leading to a product label (business to consumers) or company accreditation (business to business). However, standards are not limited to certification schemes: moratoria such as the soy moratorium strictly ban trade in and the financing of products when their production process does not meet specific standards, in

this case the standard of zero deforestation as of a set cut-off date. Private initiatives can also have the form of multi-stakeholder partnerships. These partnerships aim to improve production processes and are often connected to the development of standards, but may also have a focus on the exchange of 'best practices' to achieve increased sustainability. Since best practices also aim to enhance sustainability, initiatives to share and promote best practices implicitly use standards, and fit under the types of initiatives considered in this paper. In the remainder of this paper we will use the term 'supply chain initiatives' for all initiatives that aim at the voluntary improvement of production practices by private sector actors.

2.2 The emergence of supply chain initiatives

Pattberg (2007) distinguishes between macro and micro level factors that explain the emergence of voluntary private initiatives. At the macro level, voluntary standards developed by the private sector are generally understood to have developed as a result of societal changes since the 1980s: the upcoming of non-state actors and a decline in the influence of the nation state, with companies becoming more visible to consumers and companies being more directly targeted (Pattberg 2007). Globalisation processes, in which products are traded globally and where transnational companies produce in developing countries that are not prone to the type of regulation appreciated in the developed consumer countries, also contributed. Along with this, the development of ideas regarding organisational learning and corporate social responsibility, and the global discourse on sustainability, led to companies developing a more open attitude towards the discussion of production processes (Pattberg 2007, 96). There was combined pressure from both NGOs and companies about the need to prove their products came from sustainable sources (Bass 2001).

At the micro level, climate mitigation, deforestation and societal concerns with regard to these phenomena present both risks and opportunities for companies, which may induce changes in business strategies. Three types of risks for a company's business can be distinguished (Carbon Disclosure Project 2013): 1) operational risks – the risk that resources to produce become scarce and therefore expensive, 2) regulatory risks – the risk that governmental regulation poses standards for production, requiring changes in production processes, and 3) reputational risks – the risk that consumers are lost, because production processes do not meet their requirements. Companies may also see opportunities in these risks by providing alternative products in a niche market. As Hoffman (2004, 4) remarks, emission reductions can be seen as a market transition similar to other technology advance and consumer needs changes that have happened in the past: *"In such circumstances, companies face new competitive environments where some will decline while others rise to fill their place"*.

In relation to climate adaptation, rather than climate mitigation, operational risks can be identified in the form of the physical lack of major company resources, particularly of water resources, which could trigger companies to develop water-saving measures or alternative production processes. Operational risks in the sense of physical scarcity of forest resources may not materialise in the near future. However, operational improvements through 'best agricultural practices' that would increase yields can be attractive to companies.

The threat of new regulation can be a reason for the development of, and compliance with, voluntary initiatives. Certification may reduce the risk that formal regulation will be implemented. For example, certification by the Marine Stewardship Council (MSC) has been used as an argument by fishers to prevent the establishment of marine reserves in Australia (Gulbrandsen 2009). When in a later stage formal regulation *is* developed, existing voluntary sustainability initiatives can form the basis for formal regulation. This would give the companies involved in the voluntary initiative an advantaged position and lower their costs and efforts to comply (Hoffman 2004).

Reputational risk and opportunities logically form a driving force for voluntary supply chain initiatives. Consumer concerns and reduced demands will be important threats for companies. Voluntary involvement in sustainability initiatives can raise the company's reputation, and can also lead to new or adjusted products that better match consumer preferences. In addition, Hoffman (2004) mentions that companies can develop new products to address new market segments, and may engage in voluntary initiatives to access new sources of capital, for example through the trading of emission credits or subsidies. Also, investment banks may increasingly require compliance with sustainability criteria.

Private standards can be both individually or collectively developed. If the main underlying logic is to achieve an advantaged position vis-à-vis one's competitors, what is the incentive for engaging in collective initiatives? One reason is perhaps that individual standards have been losing in credibility because companies have tended to assess their compliance themselves, and consumers got the impression that companies had not actually changed their unsustainable practices (Pattberg 2007). Sustainability certification became 'green washing'. Moreover, the often mentioned proliferation of standards – there are currently over 300 private standards available (Alvarez / Von Hagen 2012) – increased transaction costs for companies. Collective rules and certification schemes reduce transaction costs and credibility is increased, particularly when NGOs are involved. Another potential explanation could be the fact that many certification schemes were initiated by NGOs. It is in the interests of NGOs to have high private participation in order to maximise impacts. Many NGO-initiated initiatives have been established as multi-stakeholder platforms and were meant as collective initiatives from the very beginning.

2.3 The effectiveness of private sector initiatives to reduce deforestation

When can a private sector initiative be considered effective? Literature on the measurement of effectiveness distinguishes between effectiveness at different levels: output, outcome and impact (Underdal 2002). Each of these levels can be specified for the case of supply chain initiatives to reduce deforestation.

Output effectiveness: the strictness of criteria established by a collective supply chain initiative, in relation to deforestation the strictness of criteria regarding deforestation.

At the output level, effectiveness can be considered the strictness of the criteria with which should be complied. In relation to deforestation, this concerns specifically the strictness of criteria regarding deforestation.

Outcome effectiveness: changed operations of companies to comply with the criteria

Outcome effectiveness refers to the changes in the operations of companies as a result of the initiatives. The strictness of the criteria plays a role here. Weaker goals may provide a lower threshold for participation; stricter goals may result in lower participation. As Darnall and Sides (2008, 97) indicate

> *One reason why voluntary environment programs are developed with weak design structures is that program managers are balancing the need for rigor with the goal of providing a flexible means for participants to move beyond the parameters established by the traditional regulatory system.*

What has a higher impact in the end is unknown. Will it be possible to increase the strictness of the criteria once parties comply; or can participation be increased over time in the case of criteria that were strict from the beginning?

Compliance does not automatically mean that production processes, and in this case deforestation, have changed. Companies that require little or no changes in production processes in order to comply with criteria will be more inclined to do so than companies for which this is not the case. When companies already meet consumer preferences, they can focus on communicating the sustainability of their operations to strengthen their position without increased production costs, or can exploit existing green attributes not yet known to the general public (Kolk / Pinske 2012). Also, Pattberg (2007) indicates that many companies certified by the Forest Stewardship Council (FSC) already complied with the rules, while for companies that did not comply it has been hard to meet the requirements. On the other hand, according to Gullison (2003), many companies did have to carry out corrective actions to become certified. Moreover Newsom, Hewitt and Alliance (2005) showed that companies often had to change operations in order to meet certification criteria. Auld, Gulbrandsen and McDermott (2008) note, however, that in many cases corrective actions referred to improved administration and documentation, rather than changes in production processes.

If the initiative concerns *product* characteristics rather than *production* characteristics, which is the case for example with food safety standards, it is not necessarily a problem when only companies that already comply obtain certification. However, when the initiative concerns the *environmental impact* of production processes, it is different: if only companies that already meet the criteria comply, the initiative does not have any impact on deforestation.

Impact effectiveness: total contribution to the societal objectives of the initiative

Impact effectiveness refers to the ultimate societal impacts that can be attributed to the initiative. The impact effectiveness of initiatives to reduce deforestation and related emissions is, obviously, the actual reduction in deforestation rates and in emissions related to deforestation.

As already discussed, the impact is determined by the combination of the strictness of the criteria, their implementation, and whether this actually changes production processes. The impact on deforestation is furthermore at risk from so-called ‘leakage’: the displacement of deforestation to other areas or by others. Leakage is a major threat

undermining the impact effectiveness of supply chain initiatives. To have a high impact effectiveness, leakage needs to be minimised.

Basically, three levels of impacts can be identified:

(1) *Effectiveness equals the market share of non-deforestation products*. If the changes in production processes by actors are independent of each other, the action of individual actors would lead to reduced environmental pressure. For example, a reduced use of chemicals by one producer is not likely to lead to an increased use of chemicals by others. For deforestation, it would be required that leakage would have to be prevented.

(2) *Effectiveness is lower than the market share of non*-deforestation *products*. If the forest that is not cleared by certified actors is instead cleared by others, the effectiveness of the initiative is lower than its market share.

(3) *Effectiveness is higher than the market share of non-deforestation products.* Without knowing the actual share of the market that is concerned with sustainability, companies may fear the negative impacts of bad publicity. If these companies take action, the positive environmental benefits, or reduced deforestation, may be larger than what can be expected based on market share alone.

In this research, the focus lies with output and outcome effectiveness. Impact effectiveness will not be assessed in detail, because the attribution of observed changes in deforestation to individual initiatives requires a different type of study than envisaged here. In this research, the strictness of the agreement, the part of the sector complying with this agreement, and the extent to which leakage can be avoided are considered the three factors that jointly affect impact effectiveness. The potential of an initiative to reduce deforestation will be part of the discussion.

2.4 Factors determining the functioning of supply chain initiatives

Whether a supply chain initiative will be effective at the outcome level, and subsequently at the impact level, depends on how a company responds to the risks and opportunities that the initiative creates at the output level. Company responses to risks depend on factors that characterise the company, the sector, and the countries in which the company is active (Kolk / Pinske 2012). This section proposes a framework of factors for the comparison of supply chain initiatives that aim to reduce deforestation. Four categories of factors are distinguished: 1) characteristics of the initiative, 2) supply chain characteristics of the sector, 3) the national governance setting in producer countries, and 4) economic business considerations at the company level. Figure 1, at the end of this section, summarises the factors and how they influence one another. This framework forms the basis for the comparative analysis of the various different private sector initiatives.

Characteristics of the initiative

An initiative does not only deal with the standards to assess the sustainability of production, but also the development of the standards, their adoption and implementation and the ways through which compliance is assessed (auditing and monitoring) along with how non-compliance is dealt with (enforcement) (Henson / Humphrey 2010).

This *strictness of the deforestation criteria* will be influenced by the process through which they were established. The *composition of the forum*, and *the knowledge and ideas* regarding the relationship between their activities, desired and undesired effects, and ways to address these, which they bring into the discussion, are important here. Participants will also have certain *expectations* regarding the costs and benefits of the initiative. These expectations likely consist of deliberations regarding economic business considerations and local governance as discussed above. In the negotiations regarding an initiative, the *power relations* between parties in the forum, and particularly within the sector, are likely to influence the resulting criteria. Power will play a role everywhere where interactions between actors take place, but it is included explicitly here.

The composition of the forum will also influence the decision of additional actors to join or not. When access to knowledge and the expertise of NGOs and other companies is important, the composition of the participants will attract additional actors or lead them to refrain from participation. When companies feel the composition is imbalanced and does not represent the sector, this can also be a reason to leave or not to join, as will be discussed later on for the case of the soy moratorium.

The initiative should have a clear mechanism on how compliance is to be assessed and how non-compliance is to be sanctioned. Also the quality – and independence – of the auditors is important. When consumers cannot themselves verify whether products meet criteria, an initiative has little meaning without credible *monitoring and enforcement*. In such cases, actors may receive certification but actual practices will not change.

Sector characteristics

Vertical chain integration refers to the degree of ownership of upstream suppliers and downstream buyers in a value chain (Von Hagen / Alvarez 2011). In addition to formal ownership, downstream actors can have a high leverage over upstream suppliers when chains are short or actors have been cooperating for a long time (Tallontire / Greenhalgh 2005). In an integrated supply chain, where the providers of consumer goods control or own the supply chain up to the level of production, it is easier for individual companies to influence production processes than when input is purchased through various intermediaries.

Horizontal concentration refers to the number of actors at a certain level in the supply chain. With high concentration, a few powerful actors dominate a crucial step in the supply chain, which means they have high leverage over other actors in the supply chain. The availability of a few large actors on which many producers depend played a role in the Cattle Agreement in Brazil (Walker / Patel / Kalif 2013). Here, virtually all cattle farmers depended on three slaughterhouses for the slaughtering and processing of their cattle. An agreement between three actors thus influenced an entire sector in a country.

Large actors have often been the target of NGO campaigns in the past years. Such actors with *high visibility* may be sensitive to negative publicity that targets them directly. This negative publicity – referred to by some as ‘blackwashing’ – may trigger targeted companies to change their behaviour without a direct demand from consumers for sustainable products have taken place. Higher visibility can be the case with high market concentration in a few large companies. Likewise, a transparent supply chain may be more

susceptible to consumer awareness. The length of the chain and the degree of integration and identifiability all contribute to the transparency of the supply chain. If there are legal requirements regarding traceability which could mean that products, such as meat, are labelled from early stages in the production process, or have a completely segregated value chain such as genetically modified soy, it may be easier to introduce and comply with new standards (Tallontire / Greenhalgh 2005).

The national governance setting of the producer country

Whether supply chain initiatives are effectively implemented will also depend on the governance context within the countries in which they are implemented. Standards are more easily implemented in countries with higher development conditions, clear land tenure, clear, stable and enforceable regulations and strong institutional capacity (Alvarez / Von Hagen 2012). The explanation for this is that when companies already have to comply with *forest protection laws*, it is easier for them to implement a new standard, because fewer changes are required *to meet the criteria*. However, if criteria have already been met to a large extent, compliance will have little impact on altering deforestation.

Implementation of standards may also be influenced by *institutional obstacles for compliance.* An example often mentioned is the Indonesian policy of reallocating concessions when land has not been properly developed (Brandi et al. 2013; Nikoloyuk / Burns / De Man 2010).

Economic business considerations at the company level

Revenue reductions due to environmental concerns will be traded against the perceived benefits and costs of changed production processes and certification. A concern with regard to certification schemes is that the majority of certified companies can be found in the developed world. Limited certification in developing countries is attributed to larger required changes, less incentives due to different markets, and less capacity to meeting requirements (e.g. Auld / Gulbrandsen / McDermott 2008; Cashore et al. 2006). A second concern is the favouring of large-scale companies over smaller ones (e.g. Auld / Gulbrandsen / McDermott 2008; Brandi et al. 2013). This is also related to the required investments, capacity, and administrative burden of getting certified.

Benefits can be the prevention of loss of market share, higher prices for certified products, and possibly higher yields or lower operation costs through increased knowledge of agricultural practices. Benefits originate from the *demand for sustainably produced products.* Price premiums may exist for certified products while altered production may generate credits that can be sold. It is also possible that the benefit lies in avoiding loss of consumers. In this case no additional price is paid, but producers need to respond in order not to lose their consumers to competitors. A major trigger for complying with an initiative is thus the demand for low-deforestation products. Compliance generally *costs* money. How much will depend on the *required changes to meet criteria,* and the *technical complexity* of these changes. Possibly the acquisition of land for production expansion that meets the criteria is more expensive or production processes in which trees remain on the land are more costly. Another cost, or perhaps rather a 'dis-benefit', is the loss of the possibility to sell timber from land clearing, lower yields when a smaller part of one's land is deforested, or when less drainage is allowed or expansion opportunities lost. One factor

leading to higher costs is the certification process and the membership of a roundtable itself. Often, these certification costs are borne by the producer. Companies will therefore need *resources* if they are to become involved in initiatives; besides financial resources, knowledge and capacity are also required. Generally, larger companies have such resources at their disposal more easily than smaller companies. At the same time, access to resources – particularly knowledge – can be a reason for (particularly smaller) companies to join initiatives. Pattberg (2007) found access to environmental organisations and their knowledge, associated with NGO-led multi-stakeholder platforms, to be a reason to join a private governance initiative.

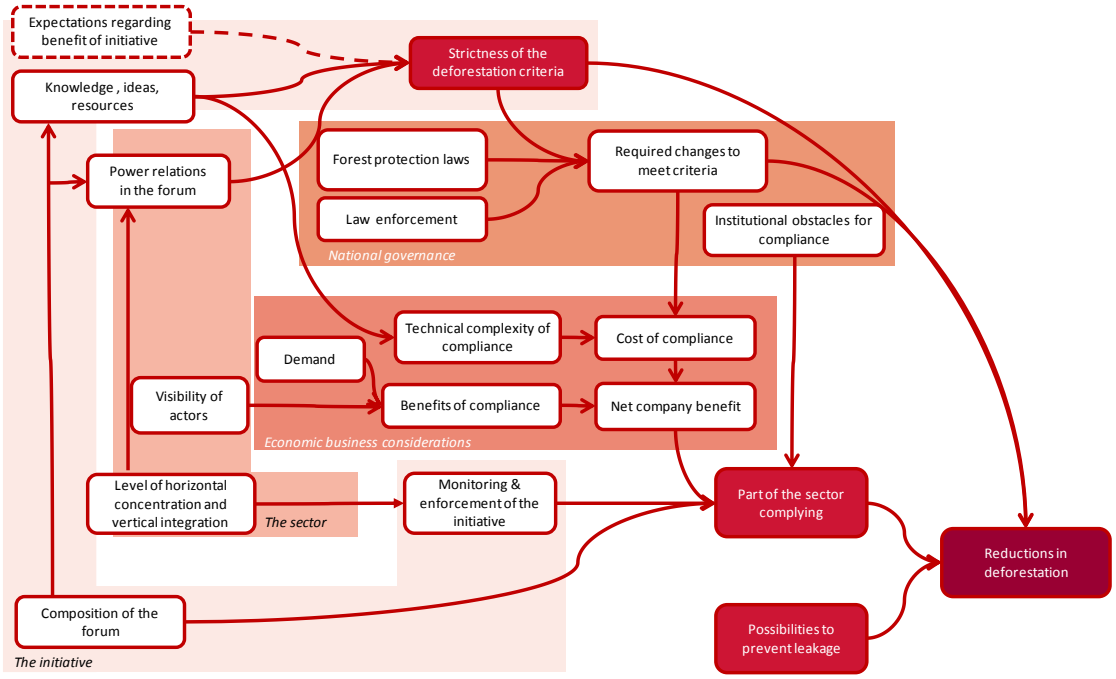
Companies act in relation to competitors. Hoffman (2004, 6) considers

> *Many today are asking whether it 'pays to be green'. [..] The question is the wrong one. The correct question asks whether there exists an economic opportunity for your company to be green vis-à-vis your competitors and then asks how and when that opportunity can best be achieved.*

The availability of resources and the perception of risks and opportunities, which are also influenced by past experiences (Levy / Kolk 2002), will determine whether companies will be early adaptors or 'laggards'. Companies not involved from the beginning, because of low business risk or insufficient resources, may later decide to adopt improved production processes. This 'isomorphism' can have underlying processes that are coercive, mimetic and/or normative (DiMaggio / Powell 1983). They are *coercive* when changes are demanded by formal regulation or other partners in the supply chain, *mimetic* based on learning from positive examples and formal education, and *normative* through formal education and global sustainability discourses. On the other hand, negative examples and experiences, for example when expected price premiums or new markets do not materialise, may lead companies to abandon the certification scheme. An additional force can play a role here: if the certification scheme is not considered credible, the expected demand for certified goods may not develop, leading to low prices for certified goods. The reputation of the certification scheme is something which develops over time, for example as a result of assessments by NGOs.

Here *net company benefit* is defined as the combination of costs and benefits. If a solution is attractive from a business point of view, it will be implemented if a company is able to overcome *technical and institutional obstacles*. Expectations regarding the net benefit will play a role in the development of supply chain initiatives and in the decision to comply.

Figure 1: Framework of factors influencing the effectiveness of supply chain initiatives to reduce deforestation



Source: Author's own compilation

3 Method

The main aim of the analysis is to understand what factors determine the effectiveness of private sector initiatives to reduce deforestation. The research applies a qualitative case study approach to compare four cases.

Case selection

There are not many examples of established supply chain initiatives to reduce deforestation for land conversion. Four initiatives relating to major deforestation commodities were selected, ones that have been operational for a couple of years. These initiatives are considered in the specific context of a producer country in order to understand the influence of the national governance setting on the functioning of the initiative. The initiatives selected are: the Roundtable of Sustainable Palm Oil (RSPO) in Indonesia, the Roundtable of Responsible Soy (RTRS) in Brazil, the Soy Moratorium in Brazil, and the Cattle Agreement in Brazil. The RSPO and RTRS are certification schemes, to which farmers can voluntarily comply in exchange for the possibility of receiving a price premium or of selling credits. Both schemes are internationally recognized with participants from various countries. The Soy Moratorium and Cattle Agreement are moratoria, to which compliance by farmers is also voluntary, but where non-compliance would result in being taken off the list of suppliers of major processers and traders.

A structured qualitative case comparison ideally considers one of two possible configurations (George / Bennett 2005): 1) the 'most similar case': cases vary in the dependent variable and in one of the independent variables; 2) the 'least similar case': cases vary little in the dependent variable, but have high variation in all independent variables but one. Due to the limited number of cases available, following this type of set-up is hardly possible. The four selected initiatives therefore do not fully match the requirements of the most or least similar cases but have been selected for their focus on reducing deforestation and for the amount of information available on each of them. Two of the initiatives concern certification schemes (RSPO and RTRS) and two concern moratoria (Soy Moratorium and Cattle Agreement), which allows for comparison of each type of initiative in two different settings as well as for comparison of the types of initiatives. The RTRS, Soy Moratorium and Cattle Agreement, are all considered for the case of Brazil, which means that the national governance setting is the same, allowing for a better comparison of the other aspects. For the RTRS and Soy Moratorium, which both regulate soy production, the sectoral and market conditions are also the same, allowing for a further comparison of the characteristics of the initiatives.

Data

This research builds on the information available from various sources. All four cases have been studied in depth by various researchers and NGOs. In addition, data from various online databases and websites have been used. Expert interviews with a limited number of persons have been conducted to fill in gaps and check findings.

Factors have been assessed at the level of the initiative and the sector; individual company decisions have not been considered in detailed. Some company responses are discussed, when they are illustrative for the functioning of the initiative.

Analysis

As mentioned above, the small number of available cases limits the selection of ideal cases, and the selected cases do not represent clear examples of most or least similar cases. Three comparisons will be made that come closest to the conditions for comparison, and the limitations will be taken into account in the interpretation of the results:

(1) Comparison of certification schemes with moratoria (where particularly the RTRS and Soy Moratorium are interesting to compare becaus7 they concern the same commodity in the same country)

(2) Comparison of the two moratoria (for different commodities in the same country)

(3) Comparison of the two certification schemes (for different commodities and in different countries)

4 Assessment of the initiatives

This section discusses the assessment of variables for each of the four initiatives. The findings are summarised in Table 1, at the end of this section.

4.1 Roundtable on Sustainable Palm Oil in Indonesia (RSPO)

The first steps to establish the RSPO were taken by the World Wide Fund for Nature (WWF) in 2002, leading to the establishment of the RSPO in 2004. The first set of "Principles and Criteria" were issued in 2007, an update became available in 2013 (RSPO 2007; RSPO 2013). The first "Certified Sustainable Palm Oil" (CSPO) came on the market in 2008.

4.1.1 Characteristics of the initiative

Deforestation-related criteria

Box 1 lists the Principles and Criteria 2013 of the RSPO that relate to deforestation and peatland development. Principle 7 covers 'Responsible development of new plantings' (RSPO 2013). The principles are not unambiguous and leave room for interpretation. Principle 7.3, which deals with deforestation, is limited to areas with 'High conservation values' (HCV) (RSPO definition included in Box 1). This principle has been criticised, because it may not include secondary forests, which are also considered to be important from a conservation and climate perspective (Greenpeace 2013). Plantings on peat are 'to be avoided', but not strictly banned (Principle 7.4). Principle 7.8 asks for a minimisation of net emissions, but does not set clear targets. This principle is an implementation period, and public reporting is required only from 2016 onwards. Although the criteria are still heavily criticised for their lack of clear targets (Greenpeace 2013; Laurance et al. 2010), improvements have been made in the 2013 Principles and Criteria compared to the first version issued in 2007. For example, under Principle 7.3 evidence that HCVs have not been replaced is now asked for, while the previous version only asked for *"identification"* and *"[taking] into account in management and operations"*. Principle 7.8 was not yet included in the 2007 version.

Box 1: Selected RSPO Principles with relevance for emission from deforestation and development of peat

7.3 New plantings since November 2005 have not replaced primary forest or any area required to maintain or enhance one or more High Conservation Values.
7.4 Extensive planting on steep terrain, and/or marginal and fragile soils, including peat, is avoided.
7.8 New plantation developments are designed to minimise net greenhouse gas emissions.

High Conservation Value (HCV) Areas: The areas necessary to maintain or enhance one or more High Conservation Values (HCVs):

- HCV 1 – Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.
- HCV 2 - Landscape-level ecosystems and mosaics. Large landscape level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
- HCV 3 - Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.
- HCV 4 - Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
- HCV 5 - Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.
- HCV 6 - Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/ or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities.

Source: RSPO 2013

Composition of the forum

Currently, the RSPO has over 1,900 members, of whom around 13% are palm oil growers. Other members are palm oil processers and traders, consumer-goods manufacturers, and retailers (together 80%), as well as NGOs and banks and investors (together 5%).

Power relations in the forum

According to Nikoloyuk, Burns and de Man (2010), decision-making in the RSPO has a high-consensus rule, which leads to slow decision-making. Unilever as well as the Malaysian and Indonesian palm oil industries have had strong positions.

Availability of knowledge, ideas and resources

It is unclear to what extent the technical possibilities were addressed during RSPO meetings. According to Nikoloyuk, Burns and De Man (2010) it takes a long time within the RSPO to develop a shared understanding of proposed ideas. It is not clear whether more ambitious proposals have been proposed but were not accepted, or whether limited possibilities for implementation have played a role in the low ambition level of the criteria.

Participants can benefit from knowledge shared through the RSPO. For example, knowledge gained through participation has helped smallholders to obtain higher yields and to use pesticides more efficiently (personal communication Inke van der Sluijs, RSPO, and Eddy Esselink, Netherlands Fats and Oil Industry).

Monitoring and enforcement

Monitoring and repercussions in the case of non-compliance have been criticised. Certification takes place through 'independent RSPO approved Certification Bodies' to audit their production (RSPO 2014b). Audits take place every year. The RSPO is seen as having limited capacity to monitor the behaviour of its members, including certified suppliers and processors, and has rejected the use of remote sensing (Laurance et al. 2010). It has been suggested that certification bodies are insufficiently capable of certification and that they are not independent. Greenpeace also mentions cases of unsustainable behaviour with little response from the RSPO. The RSPO however focuses on keeping actors on board and would seek dialogue first rather than taking certificates away (personal communication Inke van der Sluijs, RSPO, and Eddy Esselink, Netherlands Fats and Oil Industry).

4.1.2 Sector characteristics

Vertical integration

Oil palms are grown by both smallholders and large plantations. When the 'fresh fruit bunches' are harvested, they need to be processed within a short period of time. Larger plantations have their own mills, and buy the harvest from smallholders who do not have a mill. Generally the products consisting of 'crude palm oil' and 'palm kernel oil' are sold to processors who sell to consumer-goods organisations which use oil in various food and cosmetic products.

While, as mentioned, many larger plantations have their own mills, many other companies can be found in the supply chain. The lack of integration has been cited as an obstacle to implementing standards because consumer-goods manufacturers can obtain palm oil from many different sources.

Horizontal concentration

There is no clear horizontal concentration in the palm oil sector. Through the availability of mills on larger plantations and the short interval in which harvested 'fresh fruit bunches' require to be milled, smallholders will be dependent on larger plantations in their vicinity.

Visibility of actors

NGOs have targeted specific companies in their campaigns. This has resulted in many companies committing to 'zero-deforestation'. For companies at the consumer-goods manufacturer level, this is done through purchasing sustainable oil. Some refer to RSPO certified oil; others want to go beyond this. Three large traders, together accounting for around 60% of global trade, have committed to zero deforestation (United Nations 2014).

4.1.3 National governance

Forest protection laws

The legal framework regarding where land conversion and plantation expansion in Indonesia is allowed is complex, and existing regulations are not always well enforced. Areas outside official Forestry Zones (*kawasan hutan*) may cover forests that are allowed to be converted to agriculture, while already deforested areas within the Forestry Zone, which are not designated as conversion forest (*hutan yang dapat di konversi*), cannot be allocated to agriculture (Paoli et al. 2013). Land use regulations require that firms avoid planting on areas which consist for more than 30% of peat layers with more than 3 m thickness, and in riparian buffer zones. Plantations on peat should not have drainage levels lower than 40-60 cm below the surface, in order to avoid oxidation, and related emissions, and subsidence. However, the assessment of peat presence is not always undertaken on the basis of good data, and regulation is poorly enforced (Paoli et al. 2013).

A bilateral agreement was signed in 2010 between Norway and Indonesia, which included amongst other things *"A two year suspension on all new concessions for conversion of peat and natural forests"* (Government of the Kingdom of Norway / Government of the Republic of Indonesia 2010), also known as the 'Forest Moratorium'. The Moratorium went into force in 2011 and was extended for another two years in 2013. The Norwegian government committed USD 1 billion to support Indonesia in carrying out the agreement, largely through results-based payments for avoided emissions from deforestation and forest degradation. Through the Moratorium, an additional 22.5 million ha of peat and forest area has been protected in addition to the 47.8 million ha already designated 'Conservation Area' under Indonesian law (Murdiyarso et al. 2012).

The Indonesian government has issued mandatory standards for palm oil plantations; the Indonesian Sustainable Palm Oil (ISPO) standards. The ISPO focuses on compliance with Indonesian law (Brandi et al. 2013). Initiated in 2009, the aim was to have all Indonesian palm oil plantations certified by 2014. Currently, it is clear that this target will not be met (personal communication Inke van der Sluijs, RSPO).

Institutional obstacles for compliance

Indonesian local land use policies and contract terms for concessions are considered to hamper the protection of areas within plantations, possibly stimulating companies to sell land that cannot be used under the certification scheme and having it deforested by others. Paoli et al. (2013) mentions the possibility that companies have of delineating areas to be set aside (conservation set-asides) within their concession area. The conservation set-asides will remain subject to land-use taxes. Companies may thus choose to return such parts of their concession. Also, companies may be obliged under their contract to develop the area for which they have a concession within a certain number of years. If this is not done, the government has the right to allocate it to others (Nikoloyuk / Burns / De Man 2010; Brandi et al. 2013). This limits the possibility for a company to reduce deforestation by maintaining forests on part of their land.

Required changes

Required changes follow from local law, but also from the type of land that one happens to have. The impression gained from both literature and interviews is that the type of land one owns will determine whether it can be RSPO certified, rather than that seeking RSPO certification would lead to the use of different types of land.

4.1.4 Economic business considerations

Demand

Around three-quarters of the palm oil produced is exported. India, China and Hong Kong account for the largest markets, combined 34% in 2011 (Rautner / Leggett / Davis 2013). These markets have shown little interest in certified palm oil (Nikoloyuk / Burns / De Man 2010). The Netherlands comes third with 7.4%, followed mainly by countries in the Middle East and Asia. Because of these market shares, non-certified palm oil can be sold easily (Nikoloyuk / Burns / De Man 2010). When the RSPO criteria are only implemented in a relatively small part of the global market, this limits its impact considerably (Nikoloyuk / Burns / De Man 2010). Also within countries known as environmentally aware, demand is low, and the available CSPO is not taken up. Laurance et al. (2010) mention that one factor for low demand is that the RSPO criteria do not fulfil European Union (EU) Renewable Energy Directive (RED) requirements, although they also blame the economic slowdown. Since two years, a RSPO-RED module is in place which does meet the criteria, but for which there is little demand (personal communication Inke van der Sluijs, RSPO).

Benefits

The financial incentives for 'certified sustainable palm oil' production are low. In 2008, the price premium was USD 40 per metric ton of palm oil (Paoli et al. 2013); Laurence et al. (2010) mention a 8-15% price premium, while according to Greenpeace it was recently only 0.4% (USD 3 in addition per USD 710/metric ton) (for GreenPalm certificates) (Greenpeace 2013). The low price results from the low demand.

Technical complexity of compliance

Little is available about the possibilities available to palm oil growers to expand production in a way that causes no or less deforestation. Large companies already owning large areas of land will sell the pieces that cannot be developed. Meeting the criteria is hampered by lack of knowledge, lack of motivation and lack of governance capacity within companies (Nikoloyuk / Burns / De Man 2010; Paoli et al. 2013).

Researchers mention the availability of 'degraded' lands and argue that land is available to develop different sorts of activities while protecting forests (Smit et al. 2013; Koh / Ghazoul 2010). These degraded lands are often already deforested but not yet allocated to agriculture. Although it is important to know what is technically possible, little information is provided

regarding the suitability of these lands for palm oil production and of their current use and ownership. In other words: to what extent are these lands indeed available and at what costs?

Cost of compliance

Very little information is available on the cost for producers. Cost of certification is borne by growers, and RSPO members pay an annual fee. However, meeting the standards may involve other costs such as those of adjusted operations or acquisition of other types of land. The opportunity costs of missed timber yields are mentioned (Newton / Agrawal / Wollenberg 2013) but require further quantification.

Net company benefit

The image that is obtained from the literature and interviews is that companies will seek certification when they are either large or visible, or when their land easily meets the requirements.

4.1.5 Effectiveness

Strictness of the deforestation criteria

The strictness of the RSPO criteria to limit deforestation has been criticised for being ambiguous, particularly with regard to the assessment of High Conservation Values areas. Secondary forests and peat area are insufficiently protected under the criteria.

Part of the sector complying

Currently, around 10% of Indonesia's palm oil production is certified (FAO 2014; RSPO 2014a), versus 16% globally (RSPO 2014c).

Possibility of preventing 'leakage'

The RSPO cannot prevent leakage, because criteria only concern the activities of individual companies.

4.2 Roundtable on Responsible Soy in Brazil (RTRS)

With meetings initiated by the WWF since 2004, the RTRS was established in 2006. Grupo Maggi, Cordaid, COOP, WWF, Fetraf-Sul and Unilever were the organisations which together initiated the RTRS from 2004 onwards. The official establishment followed in 2006, with Version 1 of the Standards for Production published in 2010. The Standards for Production (RTRS 2013) became available in 2010 and the first soy was certified in 2011.

4.2.1 Characteristics of the initiative

Deforestation-related criteria

The main principle of relevance to deforestation under the RTRS "Standard for Responsible Soy Production" (RTRS 2013) is Principle 4.4: Expansion of soy cultivation is responsible (see Box 2 for full text of the Principle). The Principle states that expansion onto land cleared of native habitats is not allowed after 2009, except if this is in line with maps approved by the RTRS. In the absence of such maps, and if native habitats are not native forests, and if either through official maps or through an assessment it can be shown that no 'High Conservation Value Areas' are converted, expansion may be allowed. The identification of HCV areas may not be unambiguous. It is unclear what the presence and value of non-native forests is.

Box 2: RTRS Principles with relevance to emissions from deforestation

4.4.1 After May 2009 expansion for soy cultivation has not taken place on land cleared of native habitat except under the following conditions:

4.4.1.1 It is in line with an RTRS-approved map and system (see Annex 4.)

or

4.4.1.2 Where no RTRS-approved map and system is available:

a) Any area already cleared for agriculture or pasture before May 2009 and used for agriculture or pasture within the past 12 years can be used for soy expansion, unless regenerated vegetation has reached the definition of native forest (see glossary).
b) There is no expansion in native forests (see glossary)
c) In areas that are not native forest (see glossary), expansion into native habitat only occurs according to one of the following two options:

Option 1. Official land-use maps such as ecological-economic zoning are used and expansion only occurs in areas designated for expansion by the zoning. If there are no official land use maps then maps produced by the government under the Convention on Biological Diversity (CBD) are used, and expansion only occurs outside priority areas for conservation shown on these maps.

Option 2. A High Conservation Value Area (HCVA) assessment is undertaken prior to clearing and there is no conversion of High Conservation Value Areas.

Native forest: Areas of native vegetation of 1ha or more with canopy cover of more than 35 % and where some trees (at least 10 trees per hectare) reach 10m in height (or are able to reach these thresholds in situ (ie. in that soil/climate combination)).

High Conservation Value Areas are critical areas in a landscape which need to be appropriately managed in order to maintain or enhance High Conservation Values (HCVs).

Source: RTRS 2013

Composition of the forum

At present the RTRS has 174 members. 16% of the members are producers, 53% are in the category 'industry, trade and finance', 11% come from civil society organisations, and 20% are observers (RTRS 2014).

Power relations in the forum

Both texts, Elgert (2012) and Hospes, Van der Valk and Mheen-Sluijer (2012), mention the skewed power distribution among the participants. Two associations of producers and

traders, Aprosoja and the Brazilian Vegetable Oil Industries Association (ABIOVE), left the RTRS negotiations for a number of reasons: 1) imbalance in actor constellation; 2) unbalanced voting power, 3) lack of trust due to changes in decision-making structure; 4) lack of recognition of Brazilian law; 5) lack of financial compensation. Also they disagreed with proposed criteria regarding deforestation without technical rationale (Kessler / De Koning / Antoniazzi 2013). It must be noted that the fact that associations left, does not mean that the individual members of these associations left as well. Several current RTRS members are also ABIOVE members. Opponents of the RTRS even organised a counter-conference. Different types of actors have different interests, and when powerless actors felt that theirs were not sufficiently recognised, they refused to take part. *"Campesino groups opted out of the RTRS on the basis of fundamental disagreement with the discourse"* (Elgert 2012, 302). These considerations give the impression that the resulting standards were not widely supported among farmers and that technical/substantive ideas underlying the proposed standards were largely missing.

Availability of knowledge, ideas and resources

According to Elgert (2012) the discourse during the development of the criteria was not very substantive: the focus of many growers was first and foremost on a certification scheme to put clients at ease. The current constellation has led to criteria that are considered not to demand a lot from participating partners in terms of altering production processes.

Monitoring and enforcement

The RTRS has formally approved certain Accreditation Bodies (ABs), which are in charge of enabling Certification Bodies (CBs) so that they can offer conformity and certification emission assessments for any RTRS Standard. Issued compliance certificates are valid for five years (RTRS 2014).

4.2.2 Sector characteristics

Vertical integration

Soy is an annual crop which produces beans. Beans are either exported as beans, or further processed by processors who are then in charge of exporting. Soy is typically used as cattle fodder. Vertical integration is not high in the sense that trade takes place between levels. European consumers do not grow their own produce.

Horizontal concentration

The soy sector does have horizontal concentration at the level of soy traders, but nevertheless several tens of companies operate at this level and are united into a number of associations. Agreements within these associations will affect a much larger number of producers.

Visibility of actors

Three large US-based companies were mentioned by name in the Greenpeace report "Eating up the Amazon" (Greenpeace 2006).

4.2.3 National governance

Forest protection laws

The most important policy in Brazil regulating deforestation is the Forest Code, established in 1965 and allowing only 50% of private properties to be cleared of vegetation. Since 2001, this 'legal reserve' (LR) was raised to 80% of the property area in the Amazon and 20% in other biomes. Under the new Forest Code, these percentages have not changed (Soares-Filho et al. 2014). The Forest Code has proved difficult to maintain with large-scale illegal deforestation as a result. Under the new Forest Code, amnesty has been granted to a large part of the illegal deforesters, with the result that 58% of illegal cleared land does not have to be reforested (Soares-Filho et al. 2014). Local farmers often feel that Brazilian law already sufficiently protects forest and ensures sustainability: becoming certified is considered by some an administrative burden for which little is obtained in return (Moreno Peralta 2013).

Institutional obstacles for compliance

There seems to be no mention of specific policies that hinder compliance with the RTRS standards.

Required changes

A large part of the deforestation in the Amazon was already illegal under the Brazilian Forest Code, but the Code was poorly enforced.

4.2.4 Economic business considerations

Demand

Around 34% of soy is exported and traded internationally. China and Hong Kong account for 42.3 % of soy originating from 'key forest countries' in 2011 (Rautner / Leggett / Davis 2013). Major European importers together account for more than 25% of the exported soy products from these countries. Assuming that at least Europe shows environmental concern, 25% of the market from deforestation countries is susceptible to environmental concerns. Despite this, there seems to be little demand for RTRS certificates. It has been suggested that this can be partly explained by the fact that for soy many other certification schemes exist which are considered to have lower criteria (personal communication Tamara Mohr, Both ENDS).

Benefits

Certified soy is only sold in the form of certificates. There is no separate production of certified soy that is sold against a higher price.

Technical complexity of compliance

Soy is an annual crop which can be grown in one area in one year and somewhere else the next year. Particularly in Argentina, larger farmers rent land from landowners (personal communication Tamara Mohr, Both ENDS). This could mean that a producer could relatively easily rent the type of land that allows for certification. However, the extent to which land is available that allows for expansion without deforestation is unclear.

Cost of compliance

Costs of certification and of adjusted operations are borne by producers. Since little is known as to how farmers respond, the costs are not clear either.

Net company benefit

The main factor that explains the low attractiveness of the RTRS certification is the low demand. Consumers in Europe and other areas may use standards for soy production, but not the RTRS.

4.2.5 Effectiveness

Strictness of the criteria

If clear maps of what native habitats and native forests are not available, whether expansion is allowed or not depends on assessments of High Conservation Value Areas, which are not unambiguous. Moreover, forests that may not be High Conservation Value Areas may still have a climate and biodiversity value but are not protected under the RTRS.

Part of the sector complying

Currently 0.6% of Brazil's soy plantation area is RTRS-certified, versus 0.4% globally.

Possibility to prevent 'leakage'

The RTRS cannot prevent leakage, because criteria only concern the activities of individual companies.

4.3 Soy Moratorium in Brazil

Although publications on the connection between soy plantations and deforestation had been available before, the Greenpeace publication 'Eating up the Amazon' was seen as a major trigger for the establishment of the Soy Moratorium (Rudorff et al. 2012). In this report (Greenpeace 2006) particularly accuses US companies and the European livestock industry of inducing deforestation for soy plantation. As a response to the Greenpeace campaign and report, the Soy Moratorium was signed between ABIOVE and the National

Grain Exporters Association (ANEC) in July 2006, only three months after the publication of the Greenpeace report. The Soy Moratorium will not be extended after 2014.

4.3.1 Characteristics of the initiative

Deforestation-related criteria

The signing of the Soy Moratorium committed the member companies of these two organisations to the following: To *"not trade soya from the crop that will be planted as of October 2006 that come [sic.] from deforested areas within the Amazon biome […] after the date of this announcement"* (Soy Traders 2006).

Composition of the forum

The Brazilian Vegetable Oil Industries Association (ABIOVE) and the National Grain Exporters Association (ANEC).

Power relations in the forum

The two partners agreed quickly on the agreement, which was going to influence many producers. This shows the powerful position of the two associations within the Brazilian Soy sector.

Availability of knowledge, ideas and resources

Little information was found regarding the content of the deliberations but, with the quick establishment of the Soy Moratorium among a limited number of actors, it seems unlikely that the possibilities to continue soy production without deforesting and the implications for growers have been considered in detail.

Monitoring and enforcement

To monitor compliance with the Soy Moratorium, a remote sensing monitoring report is frequently made (Rudorff et al. 2012). Generally, the soy moratorium is considered to have effectively reduced deforestation (Rudorff et al. 2012; Nepstad et al. 2014; Boucher / Roquemore / Fitzhugh 2013). However, the moratorium is focused on the Amazon forest only, and little information is available regarding possible leakage to other areas. Macedo et al. (2012) did not find signs of leakage to nearby areas, but could not exclude possible leakage to other regions. According to Strassburg et al. (2014), deforestation pressures have increased on other areas in Brazil as a result of displaced production.

4.3.2 Sector characteristics

See the section on the RTRS.

4.3.3 National governance

Forest protection laws and institutional obstacles for compliance

In addition to the Brazilian Forest Code (described under the RTRS section), a bilateral agreement between Norway and Brazil (2008) in the form of results-based payments for forest protection, amounting to USD 1 billion, is considered an important contributing factor for the reduction of deforestation in the Amazon (Boucher / Roquemore / Fitzhugh 2013). The fact that deforestation was already illegal under the existing Forest Code may have played a role in the establishment of the Moratorium (Boucher / Roquemore / Fitzhugh 2013).

Required changes

The Soy Moratorium requires no more deforestation, which limits expansion. It is not clear what options exist for enhancing production.

4.3.4 Economic business considerations

Demand

See the section on the RTRS. There is an international demand for more sustainably produced soy, but the required level of sustainability varies.

Benefits

Traders faced direct risks from a number of purchasers and established the Moratorium because they considered it beneficial. Growers benefit from compliance with the Soy Moratorium because they would otherwise lose their customers: the traders in soy.

Technical complexity of compliance

It is not clear to what extent suitable land that was deforested before the cut-off date is available.

Cost of compliance

The costs related to the Soy Moratorium may be limited to lost possibilities to sell ones produce, when one does not comply. These costs are borne by producers at the lowest level.

Net company benefit

The strictness of the moratorium which specifies that produce will not be bought if requirements are not met, and the dependence of producers on the signatories to the Moratorium will make it attractive for producers to comply with the Moratorium.

4.3.5 Effectiveness

Strictness of the deforestation criteria

The criteria regarding deforestation can be considered to be strict, since they prohibit the deforestation of all types of forests, and there is no need to rely on interpretation of High Conservation Value, or what is primary or native forest.

Part of the sector complying

The two associations ABIOVE and ANEC are considered to control together 90% of the Brazilian domestic market (Rudorff et al. 2012).

Possibility to prevent 'leakage'

The agreement prevents leakage with the Amazon biome.

4.4 Cattle Agreement in Brazil

Two reports have been mentioned as instrumental to the initiation of private sector action in the cattle sector "Slaughtering the Amazon" (Greenpeace 2009) and "Time to pay the bill" by Amigos da Terra – Amazônia Brasileira, published around the same time as each other (Walker / Patel / Kalif 2013; Boucher / Roquemore / Fitzhugh 2013). In their report, Greenpeace connected global brands with Brazilian beef and leather producers and deforestation. As a result of the publication, Brazil's three largest supermarket chains, Wal-Mart, Carrefour and Pão de Açúcar, announced they were suspending contracts with suppliers found to be involved in Amazon deforestation (Mongabay 2009). The World Bank threatened to withdraw a USD 90 million loan to Bertin. As a result, four large meat packers JBS-Friboi, Bertin, Minerva and Marfrig, signed the 'G4 - Cattle Agreement' in October 2009, within 3 months of publication of the Greenpeace report.

4.4.1 Characteristics of the initiative

Strictness of the deforestation criteria

The Cattle Agreement (no author 2009) is very clear: *"No new deforestation for cattle ranching will be accepted after 4 October 2009"*. The agreement applies to the Amazon biome.

Composition of the forum

The forum consisted of the four slaughterhouses/meatpackers.

Power relations in the forum

The four partners agreed within three months after the Greenpeace publication on the agreement, which was going to influence many producers. This shows the powerful position of these companies within the Brazilian beef and leather sector.

Availability of knowledge, ideas and resources

With the quick establishment of the Agreement, it seems unlikely that these possibilities have been thoroughly investigated, or played a role in the development of the agreement.

Monitoring and enforcement

To monitor the zero deforestation commitment of the Cattle Agreement, a monitoring system was set up using satellite images of deforestation and geo-referenced farm delimitations. Using this information in July 2010, the slaughterhouses had identified 221 ranges that were involved in deforestation and suspended them from their suppliers list (Walker / Patel / Kalif 2013). Part of the Agreement was a 2-year-period to also identify indirect suppliers.

4.4.2 Sector characteristics

Vertical integration

A distinction can be made between cattle breeding farms and fattening farms. Additional sales can take place between farmers (Rautner / Leggett / Davis 2013). From farms, cattle are brought to slaughterhouses where meatpacking also takes place. Vertical integration is low. Various farms may be involved before cattle are brought to slaughterhouses, and after the slaughterhouses, additional processing takes place.

Horizontal concentration

Horizontal concentration is high at the level of the slaughterhouses/meatpackers. Currently three companies control a larger part (30%) of the Brazilian domestic market.

Visibility of actors

The slaughterhouses and meatpackers were the most directly targeted and vulnerable to responses from consumers and investors.

4.4.3 National governance

Forest protection laws and institutional obstacles for compliance

In addition to what has been written on Brazilian national forest governance in the preceding sections, the agreement with Norway has resulted particularly in pressure on Brazilian supermarkets not to sell beef that is connected to deforestation.

Required changes

The Cattle Agreement demands no additional deforestation, which limits expansion. It is not clear what options exist for enhancing production.

4.4.4 Economic business considerations

Demand

The Cattle Agreement was established as a direct result of threats from cancelled purchases and loans. 80% of beef produced in Brazil is consumed domestically (Rautner / Leggett / Davis 2013). For leather, export is more important than domestic use (Walker / Bramble / Patel 2010). Seeing the reactions from the major supermarkets, the reputation among domestic consumers does pose a risk. Also Walker, Patel and Kalif (2013) indicate that a recent survey revealed that 44% of the population is concerned about the environment. They conclude that *"40% of beef and 85% of leather production serve markets potentially susceptible to concerns about deforestation"* (Walker / Patel / Kalif 2013, 446).

Benefits

The benefits for the initiators lay in the prevention of loss of customers and loans, and for supplier companies in loss of client-slaughterhouses. There is no mention of a price premium for no-deforestation cattle-products. For the large – and visible – meat packer, the loss of customers and loans formed a more direct threat than for the cattle ranchers, although if demand dropped, that could impact the sector as a whole. The four parties that signed the Cattle Agreement had a powerful role in the Brazilian cattle sector. The chosen solution was attractive to the actors signing the Agreement, since this reduced the risk of losing their customers, while placing the burden on their suppliers. The cattle ranchers seemed to have had little choice but to comply with the criteria.

Technical complexity of compliance

Little information is available regarding technical possibilities to increase the production of beef and leather without deforestation, however Strassburg et al. (2014) computes that current productivity of cattle ranching in Brazil is around 32 to 34% of its potential.

Cost of compliance

The costs related to the Cattle Agreement may be limited to lost possibilities for selling one's produce, when one does not comply. These costs are borne by producers at the lowest level.

Net company benefit

The strictness of the moratorium which says that produce will not be obtained if requirements are not met, and the dependence of producers on the signatories to the moratorium will make it attractive for producers to comply with the moratorium.

4.4.5 Effectiveness

Strictness of the deforestation criteria

The criteria can be considered to be strict, since they do not allow any deforestation as of the cut-off date within the Amazon biome.

Part of the sector complying

The four meat packers together control around one-third of the Brazilian market.

Possibility to prevent 'leakage'

The Agreement prevents leakage within the Amazon biome.

Table 1: Summary of assessment

	RSPO – Indonesia	**RTRS – Brazil**	**Soy Moratorium – Brazil**	**Cattle Agreement – Brazil**
Entry into force/ first certification	Established 2004, criteria 2007, first certification 2008.	Established 2006, criteria 2010, first certification 2011.	2006-2014	2009
Effectiveness				
Strictness of deforestation criteria	No replacement of primary forests and HCV, avoid peat.	No replacement of native habitat, unless certain criteria are met.	No trade in soy from deforested areas in Amazon.	No cattle from ranches from deforested areas in Amazon.
Part of the sector complying	2013: 10% of production in Indonesia versus 16% globally.	2013: 0.6% of production in Brazil versus 0.4% globally.	90% of Brazilian market.	1/3 of Brazilian market.
Possibility to prevent leakage	Low, no control beyond company.	Low, no control beyond company.	Confined to Amazon.	Confined to Amazon.

Table 1 (cont.): Summary of assessment				
	RSPO – Indonesia	**RTRS – Brazil**	**Soy Moratorium – Brazil**	**Cattle Agreement – Brazil**
Characteristics of the initiative				
Composition of the forum	All components of supply chain, 13% of whom are producers.	All components of supply chain, 16% of whom are producers.	2 associations of grain traders /processers.	4 slaughterhouses.
Power relations in the forum	At start, Unilever and Indonesian/ Malaysian growers.	Unclear, associations left.	Forum consisted of powerful actors only.	Forum consisted of powerful actors only.
Knowledge, ideas, resources	Unclear about substantive discourse.	Discourse not substantive.	Not sure a substantive discourse took place.	Not sure a substantive discourse took place.
Monitoring and enforcement of the initiative	Certification by specific independent certification bodies.	Certification by specific independent certification bodies.	Remote sensing.	Remote sensing.
Sector characteristics				
Vertical integration	Many different actors for different steps.	Many different actors for different steps.	Many different actors for different steps.	Many different actors for different steps.
Horizontal concentration	Some concentration through dependence on mills.	Some concentration through dependence on traders.	Some concentration through dependence on traders.	High concentration through dependence on slaughterhouses.
Visibility of actors	Producers and manufacturers mentioned by name in campaigns.	Major producers/traders mentioned by name in campaigns.	Major producers/traders mentioned by name in campaigns.	Major slaughterhouses mentioned by names in campaigns.
National governance				
Forest protection laws	No development of plantation allowed in specific zones and on peat deeper than 3 m. Not well enforced.	Forest Code allows for only 20% of land to be deforested. Not well enforced, recent amnesty for large part of illegally deforested land.	Forest Code allows for only 20% of land to be deforested. Not well enforced, recent amnesty for large part of illegally deforested land.	Forest Code allows for only 20% of land to be deforested. Not well enforced, recent amnesty for large part of illegally deforested land.
Institutional obstacles for compliances	Hampered by the requirement to develop land for which concessions are obtained.	No specific policies mentioned.	No specific policies mentioned.	No specific policies mentioned.

Table 1 (cont.): Summary of assessment				
	RSPO – Indonesia	**RTRS – Brazil**	**Soy Moratorium – Brazil**	**Cattle Agreement – Brazil**
Required changes to meet criteria	Some requirements necessitated by law, but not enforced.	Stricter than Forest Code (FC) which allows 20% clearance, but FC not well enforced.	Stricter than Forest Code which allows 20% clearance, but FC not well enforced.	Stricter than Forest Code which allows 20% clearance, but FC not well enforced.
Economic business considerations				
Demand	Certified oil not fully taken up by market, many markets accept lower standards, price premium low.	Lower standards accepted as sustainable.	Lower standards accepted as sustainable, clear demand by major actors.	Clear demand by major actors, full demand by end-consumers not known.
Benefits of compliance	Low price premium.	Price of certificates unknown.	Risk of losing market/purchasers.	Risk of losing market/purchasers/ credits.
Technical complexity for compliance	Unclear, lands technically available but economically/ politically perhaps not.	Unclear how farmers needed to adjust operations.	Unclear how farmers have responded.	Unclear how cattle ranchers have responded.
Costs of compliance	Borne by producers.	Borne by producers.	Borne by producers.	Borne by producers.
Net company benefit	Only when the land owned/concessioned, does it already meet the criteria.	Low mainly due to low demand.	Some parties directly targeted, for growers high as a result of the moratorium.	For initiators high, avoidance of losing contracts, for ranchers high as a result of the moratorium.
Source: Author's own compilation				

5 Comparative analysis

Using the assessment of the previous chapter, this section compares the different types of initiatives. First, the moratoria and certification schemes are compared, subsequently the similarities and differences of the two moratoria are discussed, and lastly the chapter compares the two certification schemes.

5.1 Comparing moratoria and certification schemes

As has become clear on the bass of the analysis above, moratoria have been more effective in developing ambitious targets to reduce deforestation than certification schemes. Neither of the certification schemes allows the clearance of primary (RSPO) or native (RTRS) forests, but in both cases this concerns only parts of the forest and their assessment is not unambiguous.

The strictness of deforestation criteria under the moratoria can be seen as low risk for the participating partners for two reasons: First of all, they are not producers themselves and do not have to bear the costs of acquiring alternative lands or not being able to expand. Second, they control large parts of the market which means that they do not lose their competitive position. Moreover, the benefits for them are high, since they are trading with partners that have environmental concerns. The certification schemes are set-up as multi-stakeholder partnerships, without the possibility for certain groups in the supply chain to dominate others, and with compromised standards as the result.

At the outcome level, implementation is high under the two moratoria and low under the certification schemes. Costs to producers may be similar for all initiatives, when land acquisition may have become more complicated or expensive. Most likely, the costs (and administrative burden) for the certification schemes and roundtable memberships lead to higher cost for parties seeking certification than for producers affected by the moratoria. There are two large differences: 1) the direct risk for producers of not complying with the moratoria rule is high – losing the ability to sell their produce, while such a risk does not exist for those not certified, and 2) the monitoring of moratoria compliance using remote sensing is unambiguous and all encompassing, while the RTRS and RSPO criteria are more ambiguous and more difficult to verify.

Although moratoria may be more powerful, they can only be established if the sector configuration allows for it; in the two moratoria considered in this paper: a limited number of players that are vulnerable to consumer demands and on which many producers depend. If such a configuration does not exist, a multi-stakeholder initiative may be the only alternative. It will not be confined to a certain jurisdiction and, if indeed an attractive price premium is paid, producers could also benefit.

What is particularly interesting is the development of two initiatives to reduce deforestation for soy. It is surprising that the moratorium was established because of reputational risks, while at the same time demand for RTRS-certified soy is low. Apparently, the risk perceived when exposed as an unsustainable company is different from the risk of missed opportunities when not receiving certification. Competing labels that are less strict with regard to deforestation are available for soy, so it is possible that the implementation of sustainable soy certification is higher for other schemes, but the RTRS is already less strict on deforestation than the Soy Moratorium.

5.2 Comparing the two moratoria

The two moratoria have very similar characteristics: both the factors influencing the functioning and the functioning itself are similar. In both cases a limited number of visible and powerful actors decided to (temporarily) ban suppliers that deforested after the signing of the agreement. The situation in Brazil may be unique with a lot of deforestation in the Amazon region already illegal under Brazilian laws, good possibilities for monitoring through remote sensing, and financial incentives through bilateral results-based aid, and an environmentally concerned civil society. According to Boucher, Roquemore and Fitzhugh (2013) the funds provided by Norway do not fully cover the opportunity costs of the reduced deforestation, but Brazil, as an emerging economy, considers the additional costs part of its own efforts to reduced their emissions. Under the moratoria, the government

does not compensate the sector. Despite the similarities, it has been decided not to extend the Soy Moratorium after 2014, while the Cattle Agreements remains in effect.

5.3 Comparing the two certification schemes

Strictness of standards and implementation are low for both initiatives compared to the moratoria. However, when comparing the certification schemes among themselves, implementation of the RSPO certification scheme is a lot higher than of the RTRS certification scheme. The explanation for the low level of implementation has many similarities but also some differences. The incentives for certification are low in both cases. Although many companies committed to 100% sustainable palm oil, only around 50% of the available supply is taken up on the market and the price premium is low. Moreover, despite the media attention for 'zero-deforestation' policies, the largest markets for palm oil are in India and China, where there has so far been relatively little demand for sustainable palm oil.

It is unclear whether the low ambitiousness of the certification schemes with regard to avoiding deforestation plays a role in the low market uptake. A higher market uptake may create incentives to further strengthen the RSPO, although one reason for parties to leave the RSPO has reportedly been the frequent changing of the rules (Brandi et al. 2013). The quality of the certification and the lack of repercussions for non-compliance have been severely criticised in the literature as well.

For the RTRS, the reason for the low certification may be different. There seems to be less criticism in the literature. Rather, farmers show little interest in becoming certified, because of the administrative hassles, while they think that the Brazilian environmental laws already regulate matters sufficiently (Kessler / De Koning / Antoniazzi 2013). Moreover, buyers of soy have adopted other, less strict, standards for soy, reducing demand for RTRS certificates.

6 Discussion

This section generalises the findings from the analysis and discusses four topics. First all, based on information on strictness of criteria, compliance and prevention of leakage, the possibilities of supply chain initiatives to reduce deforestation are discussed. Secondly, demand for low-deforestation products is key to the success of any supply chain initiative. How does demand develop and how can it be influenced? Third, it was found difficult to obtain a good understanding of exactly what it implies for farmers to comply with standards. Not knowing this means that it is unclear what incentives are created for farmers, who bears the costs, and who receives the benefits. Finally, the interaction between public and private governance is briefly discussed. For the development of public policies to reduce deforestation, it is important that the role of private initiatives is understood, and lessons from supply chain initiatives and the incentives that are or are not created are important for the development of effective public policies.

6.1 The main question: can private sector initiatives reduce deforestation?

Risk of leakage under the RSPO certification scheme is currently high: if land cannot be deforested, it is sold. Subsequently the area may be deforested by actors producing for other markets. Only if the full sector participates, will it impact on deforestation, with the risk that land is sold to other types of use for which no standards apply. For the RTRS certification scheme, the process may be different but the result is likely to be the same. Soy, as an annual crop, can be farmed more flexibly in different areas from one year to another. Soy producers can thus more easily choose the land that meets the requirements. Deforestation can then still continue for non-certified soy or other crops. The two moratoria, on the other hand, have the potential to have an impact higher than their market share, since the meatpackers' fear of losing certain customers or investors has led them to prohibit deforestation altogether. However, since the initiatives only apply to the Amazon, the risk of leakage to other areas still exists.

For supply chain initiatives to avoid leakage and have high impact effectiveness, high sector coverage and high jurisdictional coverage is required. Although the RSPO has been heavily criticised for not being sufficiently ambitious, high participation in the RSPO may be a key factor to realising sector-wide improvement in the long run.

6.2 The main driving force: demand for low-deforestation commodities?

Reputational risks and loss of markets have played an important role in company involvement in supply chain initiatives, which was most clear for the Cattle Agreement, but also for the other initiatives. This risk directly depends on the awareness and concern of consumers of commodities for which deforestation takes place. However, in the case of the moratoria, perhaps the perceived risk resulting from being negatively exposed to consumers may have been more important than the actual market share relating to sustainability. This would explain the different compliance levels for the Soy Moratorium and the RTRS.

Nevertheless, it is important to continue efforts to raise awareness among consumers in those countries that form the major markets of products for which deforestation takes place. Also, it might be worthwhile to raise awareness among local actors in producer countries, both civil society and government. For this, it is important to connect deforestation to direct local impacts and the international reputation of the country.

Any mechanism that is developed in response to consumer demands should be monitored to ensure compliance and credibility. The straightforward criteria of the moratoria allowed for unambiguous monitoring and enforcement. For the certification schemes, it is less clear what companies would actually have to do differently in their production processes in order to comply. Whether the criticism regarding the certification process plays a role in the low uptake of certified sustainable palm oil remains an open question. Many companies that use palm oil have committed to sustainable palm oil or zero-deforestation palm oil from 2015 onwards, which may result in a higher uptake next year.

Laurance et al. (2010) mention, as part of a potential solution, the mandatory and explicit labelling of the use of palm oil in products to increase transparency for consumers. As of

December 2014, this will be the case in the European Union. The Netherlands government announced it would source 100% of its crude palm oil (CPO) import from certified sustainable sources by 2015 (Paoli et al. 2013).

6.3 The main unknown: farmer responses?

The two roundtables have been described as largely political negotiations, while the moratoria were a quick response to a risk, without involving producers. None of the four initiatives seemed to have discussed in detail the complexity, costs and benefits for farmers to reduce deforestation and to acquire 'suitable' land instead. If complexity, costs and benefits were better understood, public actions could focus on providing incentives to support change.

There seems to be little insight in the possibilities for farmers to continue production while meeting criteria. Apart from leakage, there is a risk that certification does not alter production processes. Largely, it seems to be a choice: if a farmer happens to have land that meets the requirements, then certification will be sought; if not, it will not. This is particularly the case for the smallholder situation (personal communication Inke van der Sluis, RSPO, and Eddy Esselink, Netherlands Fats and Oil Industry). For larger plantations, the choice may be to sell the non-certifiable land.

Moreover, even if companies seek to acquire other lands, it is unclear what the availability of this land is, what its use was before it became a plantation or ranch, and whether previous users have started to deforest new land elsewhere. In Brazil, soy farmers have turned to acquiring land that was already deforested, which contributed to low deforestation rates during the moratoria. It is however unclear what the availability of already deforested land is for further expansion. In Indonesia, similar questions can be asked for 'degraded' lands, which are promoted to be used for palm oil instead of forest and peat areas, but of which it is unclear what the technical, social and institutional constraints are towards using these lands for palm oil expansion

6.4 Interactions between public and private governance

Private and public initiatives interact. As was mentioned earlier in this paper, privately developed initiatives can influence the formulation of formal policies. Pattberg (2007) refers to this process as upstream integration. This process can strengthen the coercive force through which increasing numbers of companies adopt the standard. Nikoloyuk, Burns and de Man (2010) see incorporation of private sector initiatives into national legislation as the long-term solution to which initiatives such as the RSPO should contribute. Pattberg (2007) discusses upwards integration in the case of the FSC, where the availability of certified products facilitated public procurement policies requesting certified wood and paper. Another example are the Indonesian Sustainable Palm Oil criteria that were developed in response to the RSPO. While the RSPO is voluntary, the ISPO is mandatory for all Indonesian growers.

Public policies are thought to have contributed to the effectiveness of the moratoria in Brazil. Although deforestation has recently been reported to be on the rise again in Brazil,

it was apparently the combination of existing laws, monitoring possibilities, international financial incentives and pressures from NGOs and civil society rather than one of those alone that has reduced deforestation in Brazil over the past decade. Boucher, Roquemore and Fitzhugh (2013) and Nepstad et al. (2014) attribute Brazil's success in reducing deforestation to a combination of public and private initiatives. This is in line with other research on certification schemes which suggests that private initiatives alone are unlikely to prevent deforestation (Alvarez / Von Hagen 2012; Gullison 2003).

7 Conclusions: what explains the effectiveness of private sector initiatives to reduce deforestation?

This paper has aimed to provide insights into what factors determine the effectiveness of supply chain initiatives to reduce deforestation. The paper constructed a framework based on factors mentioned in the literature as playing a role in the effectiveness of private sector initiatives. The application of this framework to analyse and compare four existing cases gives insight in whether factors indeed played a role, but a definitive answer on what the most important factors are cannot be derived from the qualitative comparative case study.

At the same time, interesting insights have been gained:

Consumer demands for low-deforestation products, or the lack thereof, are found to play an important role, which also translates into financial incentives to produce more sustainably. Moratoria have benefitted from a concentration of power in major (associations of) traders combined with monitoring through remote sensing which has led to strict criteria to reduce deforestation and large compliance. Multi-stakeholder initiatives such as the roundtables on the other hand focus on participation and accept compromises in terms of deforestation and emission targets. Whether this approach will pay off in the long run cannot yet be established. The inclusion of the ISPO criteria in national legislation in Indonesia is (partly) attributed to the RSPO initiative, which shows that initiatives can lead to change, albeit so far marginal.

Effectiveness of supply chain initiatives is annulled if they do not lead to the altered behaviour of producers or when, through leakage, deforestation is then carried out by others. The technical and political possibilities for farmers to expand production without deforestation are not well understood. Understanding these possibilities and the related responses of producers is essential to developing policies to complement private sector initiatives.

Conclusions drawn for other private sustainability initiatives are valid here as well: the initiatives play a role in raising awareness and developing an understanding, but are unlikely in themselves to largely reduce deforestation. International governmental and non-governmental parties, as has been suggested by others as well, should continue to combine the promotion of sustainable products in consumer countries, with support in producer countries to better enforce laws and change contra-productive regulations and incentives.

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