



Wettelijke Onderzoekstaken Natuur & Milieu

Integrating ecosystem services into the tropical timber value chain

Dutch policy options from an innovation system approach

| WOt-werkdocument 344

J. van den Berg, V.J. Ingram, M.-J. Bogaardt and B. Harms



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Integrating ecosystem services into the tropical timber value chain

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This document was produced in accordance with the Quality Manual of the Statutory Research Tasks Unit for Nature & the Environment (WOT Natuur & Milieu).

WOT Working Document **344** presents the findings of a research project commissioned by the Netherlands Environmental Assessment Agency (PBL) and funded by the Dutch Ministry of Economic Affairs (EZ). This document contributes to the body of knowledge which will be incorporated in more policy-oriented publications such as the National Nature Outlook and Environmental Balance reports, and thematic assessments.

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Wageningen, December 2013

Abstract

Berg, J. van den, V.J. Ingram, M.-J. Bogaardt & B. Harms (2013). *Integrating ecosystem services into the tropical timber value chain; Dutch policy options from an innovation system approach*. Wageningen, The Statutory Research Tasks Unit for Nature & the Environment (WOT Natuur & Milieu). WOT-werkdocument 344. 113 p.. 10 Figs.; 10 Tabs. 169 refs. 4 Annexes.

This WOT Working document explores the governance options available to the Dutch government for the promotion of the sustainable use and maintenance of ecosystem services in tropical timber value chains with Dutch links and how ecosystem services can be given a more explicit place in the public and market mechanisms that govern the tropical timber chain. This document presents the results of a discourse analysis on how Dutch policies and practice address ecosystem services along with the results of a detailed examination of four specific cases of innovation from within the tropical timber chain: the Sustainable Trade Action Plan (STAP) 2011-2015, Forest Stewardship Council (FSC) and ForCES certification, the Dutch public procurement policy and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiative. From the discourse analysis this document concludes that the term ecosystem services is not yet clearly defined, a result of its strong link to markets and attempts to define it in terms of economic value. Lessons to be learnt from the analysis of the four innovation cases include the need to simplify what is meant by ecosystem services, the need for evidence of the impact of certification and how it maintains or enhances ecosystem services, the need to work towards a list of internationally agreed-upon impact indicators; the need to harmonize the array of certification schemes available and the need to know how the government can mix policy strategies using market based 'carrots' and incentive based 'sticks' (such as tax incentives and pilots) to stimulate new partnerships. These lessons have resulted in five recommendations for the Dutch government on how to further integrate sustainable use and maintenance of ecosystem services in the tropical timber chain.

Key words: Ecosystem services, value chains, innovation, tropical timber, policy, trade, development

Trefwoorden: Ecosysteemdiensten, handelsketen, innovatie, tropische hout, beleid, handel, ontwikkelingssamenwerking

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The Working Documents series is published by the Statutory Research Tasks Unit for Nature & the Environment (WOT Natuur & Milieu), part of Wageningen UR. This document is available from the secretary's office, and can be downloaded from www.wageningenUR.nl/wotnatuurenmilieu.

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Foreword

We are appreciative and acknowledge the collaboration with the Netherlands Environmental Assessment Agency, PBL (Marc van Oorschot and Marcel Kok) and Alterra Wageningen UR (Eric Arets) on this study. We are very grateful to the staff of IDH, WWF, FSC, CIFOR, SNV and WCMC for sharing their ideas and information. Special thanks go to Lucas Judge (LEI Wageningen UR), who assisted with the final editing of this document.

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Abbreviations

CBD	Convention on Biological Diversity
ESES	Ecosystem services
ETTF	European Timber Trade Federation
FLEGT	Forest Law Enforcement and Governance and Trade
ForCES	Expanding FSC certification to Ecosystem services' project
FSC	Forest Stewardship Council
IDH	Initiative for Sustainable Trade
LEI-WUR	Agricultural Economics Institute, Wageningen University and Research centre
MDG	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
MTCC	Malaysian Timber Certification Council
PBL	Netherlands Environmental Assessment Agency
PEFC	Program for the Endorsement of Forest Certification
REDD	Reducing Emissions from Deforestation and Forest Degradation
SMK	Association for Environmental Trademarks (<i>Stichting Milieukeur</i>)
STAP	Sustainable Trade Action Plan
STI	Sustainable Forestry Initiative
TEEB	Economics of Ecosystems and Biodiversity
TPAC	Timber Procurement Assessment Committee
UNFCCC	United Nations United Nations Framework Convention on Climate Change
VC	Value Chain
VNO/NCW	Confederation of Netherlands Industry and Employers
VPA	Voluntary Partnership Agreement
WVNH	Netherlands Timber Trade Association
WOT/KO	Statutory Research Tasks / Knowledge assignment
WTO	World Trade Organisation
WWF	World Wildlife Fund

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Summary

The term 'ecosystem services' is used to describe the benefits that humans receive from natural assets, such as soil, plants, animals, air and water, translated into 'services' that people value (Millennium-Ecosystem-Assessment, 2005). They are grouped into four broad categories: provisioning (also known as goods), regulating, supporting and cultural. Awareness of the role of ecosystem services in enabling human habitation and economic activity has increasingly been tempered by an acknowledgement of the threat posed to the long-term health of ecosystems by human activity. To inform decision-makers about the importance of ecosystem services and to stimulate policies that improve how the ecosystems supporting and providing them are managed, efforts are being made to make ecosystem services more visible and relevant, by assigning them a value.

This study explores the governance options available to the Dutch government for the promotion of the sustainable use and maintenance of ecosystem services in tropical timber value chains with Dutch links and how ecosystem services can be given a more explicit place in the public and market mechanisms that govern the tropical timber chain. The International tropical timber value chain was chosen as a test-case after reviewing the priority products from the Sustainable Trade Action Plan (STAP) and consulting with the study's governmental TEEB steering group. This study aims to provide insight into how the feed-back process (between value perception and ecosystem management) can be influenced to take ecosystem services better into account. Triggers, barriers, stimuli and other contextual factors or framework conditions for relevant decision making platforms/arrangements are identified, and related to governance options and policy instruments available to the Dutch government.

This document presents the results of a discourse analysis on how Dutch policies and practice address ecosystem services along with the results of a detailed examination of four specific cases of innovation from within the tropical timber chain in terms of the attention given to ecosystem services. The four cases include the Sustainable Trade Action Plan (STAP) 2011-2015, Forest Stewardship Council (FSC) and ForCES certification, the Dutch public procurement policy and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiative.

From the discourse analysis this document concludes that the term ecosystem services is not yet clearly defined, a result of its strong link to markets and attempts to define it in terms of economic value. The four cases highlight the fact that ecosystem services are not explicitly mentioned in value chain innovations. FSC certification – one of the main mechanisms used to promote more sustainable chains – is an exception, implicitly driving the integration of ecosystem services in three of the cases. The involvement of multiple stakeholders along the chain is seen in all cases as critical to their success, although the extent to which civil society and consumers (private, corporate or public) participate is debatable. The indirect role of the Dutch government in the four cases raises questions about the influence of the government on private regulations. The speed of success of FSC certification in ensuring sustainable forest management raises doubts about whether a more 'command and control' approach initiated by the government would be more effective in increasing the sustainability of the tropical timber value chain.

Lessons to be learnt from the analysis of the four innovation cases include the need to simplify what is meant by ecosystem services, the need for evidence of the impact of certification and how it maintains or enhances ecosystem services, the need to work towards a list of internationally agreed-upon impact indicators; the need to harmonize the array of certification schemes available and the

need to know how the government can mix policy strategies using market based 'carrots' and incentive based 'sticks' (such as tax incentives and pilots) to stimulate new partnerships. These lessons have resulted in five recommendations for the Dutch government on how to further integrate sustainable use and maintenance of ecosystem services in the tropical timber chain. These five recommendations are:

1. Consider developing a clear and coherent policy implementation strategy that makes clear and explicit the role of ecosystem services in policy concepts such as 'sustainable inclusive growth', 'natural capital' and 'green economic growth'.
2. Consider (more direct) governmental engagement in multi-stakeholder learning platforms such as the EU Sustainable Tropical Timber Coalition, REDD+ Business Initiative (Platform BEE) and Tropical Forest Alliance and Green Deals, to increase consumer & business-to-business awareness of biodiversity and ecosystem services to change consumer preferences and purchasing decisions.
3. Consider funding studies to show the impact of certification schemes on ecosystem services and of pilots to explore how ecosystem services could be further integrated into timber chains, including new sorts of certification (e.g. ForCES) specific to ecosystem services (alone or in bundles), through partnerships with companies, civil society and research.
4. Re-consider current policy instruments that stimulate (timber) product certification. Other instruments are needed to help the private sector to respond to the market opportunities for ecosystem services, for example by incentivizing demand for ecosystem services through fiscal incentives.
5. Re-consider governmental involvement in standard settings of certification schemes, to ensure that ecosystem services are explicit and the monitoring of the functioning of the systems and outcomes occurs.

1 Introduction and methodology

1.1 Ecosystem services and policy background

The term 'ecosystem services' refers to the benefits humans receive from natural assets, such as soil, plants, animals, air and water, translated into 'services' that people value (Millennium-Ecosystem-Assessment, 2005). Defined in Box 1, ecosystem services can be grouped into four broad categories: provisioning (also known as goods), regulating, supporting and cultural services. Awareness of the role of ecosystem services in enabling human habitation and economic activity has increasingly been tempered by an acknowledgement of the threat posed to the long-term health of ecosystems by human activity. To inform decision-makers about the importance of ecosystem services and to stimulate policies that improve how the ecosystems supporting and providing them are managed, efforts are being made to make ecosystem services more relevant and visible, by assigning them a value. The on-going challenge of ascribing economic value to nature is prompting shifts in how we recognize and manage our environment, economic development and humanity's future (TEEB 2009) 2010a; 2010b).

Box 1 Definition of ecosystems, ecosystem services and biodiversity

The terms **biodiversity, ecosystems and ecosystem services**, in this document abbreviated to 'ES' are defined as follows: **'Biodiversity'** is short-hand for 'biological diversity'. The UN Convention on Biological Diversity (CBD), which defines biodiversity as "The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (Article 2). According to the CBD, **'ecosystems'** are one component of biological diversity. The Millennium Ecosystem Assessment (MA, 2005) identifies an ecosystem as "a dynamic complex of plant, animal, and microorganism communities and the non-living environment interacting as a functional unit". MA elaborated **'ecosystem services'**, as the benefits people receive from ecosystems. Ecosystem services are dynamic, as they are culturally determined, being conceptualizations of the 'useful things' ecosystems 'do' for people, directly and indirectly, whereby it should be realized that properties of ecological systems that people regard as 'useful' may change over time even if the ecological system itself remains in a relatively constant state" (TEEB, 2010, Chapter 1, pp. 12 and 15).

The ecosystem services concept inherently brings together the economy and environment, highlighted by a global study on the economics of ecosystems and biodiversity (TEEB), which elaborates the role of business and enterprise in how we manage, safeguard and invest in our natural capital (TEEB, 2009). This paradigm shift has occurred both in the Netherlands and Internationally (Van Wensem, 2013; Wittmer, Berghöfer *et al.*, 2013). The ecosystem services concept, using catchphrases such as 'making nature's value's visible', 'mainstreaming nature' and 'valuing natural capital', has received significant attention since the Millennium Ecosystem Assessment (Melman *et al.*, 2011) and the recent series of Dutch Economics of Ecosystems and Biodiversity (known as TEEB) studies¹. This attention has resulted in ecosystem services becoming a buzzword, in much the same vein as concepts such as biodiversity (Brown *et al.*, 2007).

The priority products from the Sustainable Trade Action Plan (STAP) were reviewed in consultation with the governmental TEEB steering group of this study. The tropical timber chain was selected as the initial commodity to focus on. One of the reasons the chain was selected is because it is the subject of a parallel statutory public task knowledge assignment (WOT/KO) project being conducted by Alterra Wageningen UR which looks to address the effects of Dutch imports of tropical timber on

¹ <http://www.rijksoverheid.nl/onderwerpen/biodiversiteit/nederlandse-bescherming-biodiversiteit>

ecosystem services and the social costs and benefits of sustainable production. This chain was used to develop the analytical framework and to test any lessons learnt.

This study seeks to explore the governance options available to the Dutch government for promoting the sustainable use and maintenance of ecosystem services in tropical timber value chains with Dutch links and how ecosystem services can be given a more explicit place in the public and market mechanisms that govern the chain. Governance options refer to ‘how’ Dutch government agencies can act on Dutch policy goals (‘what’) in relation to increasing the sustainability of value chains for key commodities. The study contributes to the Netherlands Environmental Assessment Agency (PBL) TEEB for Dutch supply chains project, which aims to generate insights into the economic effects of resource production in terms of costs and benefits, biodiversity and the use of ecosystem services in both producing and consuming regions. These impacts will have consequences for development perspectives in producing areas. Information about these effects and their consequences are the basis for decision making and innovation in relevant value-chain governance arrangements that may influence production processes in directions aimed at reducing the negative impacts on valued services.

1.2 Aim and research questions

The aim of this study is to explore the governance options available to the Dutch government for the promotion of the sustainable use and maintenance of ecosystem services in tropical timber value chains with Dutch links and how ecosystem services can be given a more explicit place in the public and market mechanisms that govern the tropical timber chain.

Working within the framework promoted by the International TEEB cascade approach (see Figure 1) this study aims to provide insight into how the feedback process (between value perception and ecosystem management) can be influenced to take ecosystem services better into account. Triggers, barriers, stimuli and other contextual factors or framework conditions for relevant decision making platforms/arrangements are identified, and related to governance options and policy instruments available to the government (see Section 2.7 for details on the methodological framework).

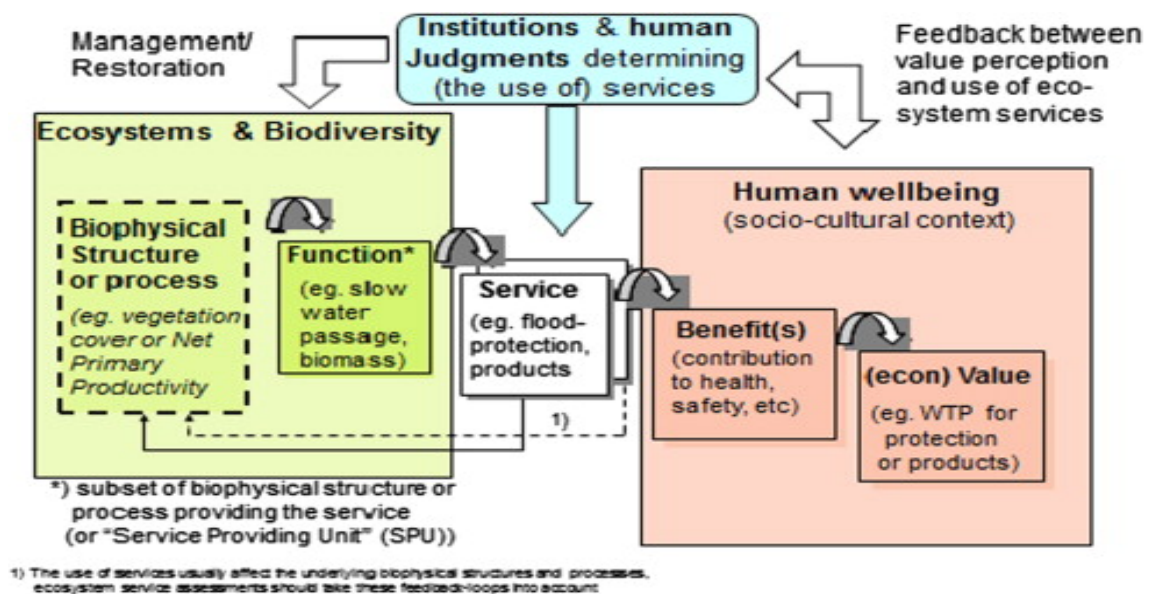


Figure 1 Ecosystem services. (Source: Braat and De Groot 2012)

The underlying goal of the study is to assess whether there are 'wins' to be gained for chain sustainability by understanding and improving the integration of ecosystem services. Sustainability infers being able to meet the needs and aspirations of the present without compromising the ability to meet those of the future (Bruntland, 1987), such that both livelihoods of people dependent upon natural resource based chains can cope with risks and recover from stresses and shocks and maintain or enhance its capabilities and assets, both now and in the future, while not undermining the natural resource base upon which the chain is formed (Chambers and Conway, 1991). Sustainability thus implies that ecosystem services are maintained or conserved despite being used and in some cases commoditised.

In consultation with PBL, the study focuses on the following five questions in relation to the tropical timber chain:

1. What are the assumptions behind the roles of research, business, civil society and policy underlying current Dutch policies to increase the sustainability of international value chains? How are ecosystem services positioned in these policies?
2. What is the importance of ecosystem services in the tropical timber value chain? And how has the concept evolved into practical sustainability initiatives in the chain?
3. What can we learn from concrete sustainability initiatives in the tropical timber value chain?
4. What can we learn from an innovation system approach for the sustainable use and maintenance of ecosystem services in the tropical timber value chain?
5. What are possible strategies and instruments that can be recommended to the Dutch government?

A conceptual framework was developed, guided by innovation systems and a value chain analysis. Based on this framework, an in-depth analysis of four cases of innovation within the tropical timber value chain is conducted to examine to what extent ecosystem services are addressed by Dutch policy. The cases are analysed using a literature review and interviews with key stakeholders. The case studies aim to answer the following four sub-questions:

1. What is the innovation relating to ecosystems services in the tropical timber value chain? Where in the chain did it take place how, why and when (changes over time)?
2. What are the triggers and drivers, the opportunities and barriers behind the innovation?
3. Who are the stakeholders having taken part in the innovation process, and what are their relationships, in terms of knowledge, power, function and network (rules of the game)?
4. How did learning occur between the stakeholders and what impact/outcomes occurred due to learning?

Relevance of project for the Dutch government

This study contributes to the Netherlands statutory annual environmental accounts (balance sheet) as the study is part of the identification of promising options for steering the maintenance and management of ecosystem services in international value chains. The coordination of this study is part of the on-going TEEB process, together with the Dutch Ministries of Economic and Foreign Affairs.

Audience and knowledge requirements

The target audience for this study are policymakers and actors in value chains with a direct link to the Netherlands along with stakeholders involved in conserving, maintaining and using ecosystem services that are impacted upon by international value chains. The study assumes a basic knowledge about ecosystem services, the tropical timber value chain, value chain actors and the conceptual frameworks. These terms and processes are therefore explained in both qualitative and quantitative terms. The governance aspect of ecosystem services is still relatively unexplored and thus governance options – for not only the government but for all actors concerned with chain governance including private sector, civil society and support organisations such as research institutes - are also

explained. The study aims to inform the target audience, providing them with the information they need to improve policy and decision making. This includes information on innovation in the chain with respect to ecosystem services, the tools and mechanisms used and the results of these innovations, areas in need of further attention and recommendations based on an assessment of these innovations.

Scope of the study

This phase of the research represents a pilot in terms of developing and testing the conceptual framework using one value chain. The aim is to learn from the application of the method to the international tropical timber value chain using cases, and then to apply this to further value chains, refining the concept and method based on this experience. The scope is thus initially limited to international tropical timber value chains which have a Dutch connection (i.e. imports to the Netherlands, Dutch consumers or timber companies). The geographical scope of the study is international, given the nature of value chains and the impacts of value chain operations on ecosystem services. The governance possibilities are analysed from the perspective of the Dutch Government and its sphere of influence.

1.3 Research methods

Discourse analysis

To identify the assumptions behind the current and expected roles of different societal actors in the current Dutch policy discourse on ecosystem services and the sustainability of value chains, an analysis of governmental discourses is conducted using discourses and frames as conceptual tools (see Chapter 3). Discourse analysis is embedded in the concept of political ecology (see Section 2.2). By using this perspective relationships between value chain actors can be illustrated in terms of the discourses underlying policies and institutions: storylines or narratives about whom or what is seen as the 'culprit' and what is considered to be the appropriate solution for a problem. Thus norms based on facts and their interdependency can be created. Once facts have been identified they can support or create further discourses (Forsyth, 2003) and can determine the analysis of and policy solutions for forest governance. There are politics to this knowledge, as some bodies of knowledge (e.g. local knowledge or 'soft' anthropological knowledge) are often ignored. This can be an element of power in environmental narratives as it is difficult to prove that certain narratives are wrong. They can only be replaced by more convincing stories.

Every message has a frame that offers a context wherein the message can be understood. It provides a heuristic for how to categorize and organize data into meaningful chunks of information (Gray, 2002). The frame allows for the individual to link up the new aspects in a message to a broader familiar network of perceptions about the world around us (Van Gorp, 2006). These frames provide information that may or may not be deliberately provided, such as a view or story on the relation between economy and ecology. Entman (1993, p.52) describes the process of framing as follows: "to select some aspects of a perceived reality and make them more salient through a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation and/or a treatment recommendation". Framing is a theoretical concept, developed initially from cognitive psychology, now rooted in communication sciences.

Framing and frames are extensively used conceptual tools that have developed many definitions, according to the disciplines in which they are used. According to Barbara Gray (2002) framing refers to the process of constructing and representing our interpretations of the world around us. Van Gorp (2006) describes a frame as; 'a stable, meta-communicative message that gives a structural conception that grants structure and meaning to a message'. These frames are constructed from and embodied in the key words, metaphors, concepts, symbols and visual images emphasized in a discourse (Van Gorp, 2006). A frame does two things: it determines the topics that are discussed

and secondly it determines how these topics are approached. These two functions are related to the two aspects of frames as described by Van Gorp (2006). Framing devices are meta-communicative messages that are manifested in word choice, metaphors, descriptions, and stereotypes. Reasoning devices relate to the 4 main functions that the frame fulfils: they define the problem (the problem description), who or what has caused it (the causal interpretation), gives a moral argument (the moral evaluation) and how the situation can be resolved (a treatment recommendation).

Using the analogy of a painting, reasoning devices determine the topics under discussion and are the shapes. The framing devices determine the approach of these topics and are the colours. The discourse analysis as it was realized in this study aimed to identify the framing and reasoning devices and thereby identify the frames used by the government to paint a full picture, to describe cross sector collaboration on sustainable value chains.

Case study research

The case study research is qualitative and interpretative in nature. The research team construed governance arrangements, learning and innovation by interpreting written data and interviews with selected stakeholders in the innovations in the timber chain. Using cases as the main primary data collection method has its strengths and weaknesses in terms (see Annex 2 & 4) of the validity of conclusions that can be drawn (Devaux *et al.*, 2009). They are also subject to significant criticism in terms of their statistical conclusions and their external and construct validity. Meyer (2001) therefore recommends that decisions on case design, data collection, analysis, validity and reliability are made explicit. A “quick scan” of cases provides sufficient data to summarize the contextual nature of contemporary phenomena in real-life contexts and a holistic presentation (Tellis, 1997). The innovation cases were selected based on information-oriented sampling, using the research team and client’s knowledge of tropical timber value chains. Yin (2009) highlights that an average case is often not the richest in information but extreme and different cases are more revealing. For this reason, innovations along a continuum of drivers were chosen. This aims to clarify the causes of different innovations, governance arrangements and their impacts.

The following criteria were used to select the four cases eventually chosen (see Table 1 for list of cases):

- The case makes reference - in one form or another - to ecosystem services;
- The case is representative of international (timber) value chains and has a link to the Netherlands;
- The case provides an illustration of innovation and learning in the value chain;
- The cases provide examples of a continuum from direct to indirect government involvement and governance, to private sector and civil society governance.

A number of interviews were conducted per case to triangulate the literature and respond to specific gaps in data, and/or clarification. The selection of actors to be interviewed involved a balance between data quality, cost and time restraints. The small number of people interviewed means that bias in discourses and interpretation is a limitation of this study. The interviews did not aim to provide a representative perspective from all parties involved in the chain or case. For this reason the interviews are anonymous. As stakeholders can also be information gatekeepers, they were asked the same questions using semi-structured questions to avoid bias and triangulate the data. The semi-structured question list based on the research questions and case outline is shown in Annex 1. Additional data was collected through a literature review and analysis. Specific documents, policy documents, websites, databases and media were used.

Table 1 Selected innovation cases in the tropical timber value chain

Case	Driver	Focus	Innovation	Learning
Sustainable Trade Action Plan 2011-2015	Dutch government	Multi-stakeholder partnerships and platform	Institutional framework, finance	Explicit in IDH business model
Forest Stewardship Council (FSC) and ForCES certification	(International and Dutch) Private sector	Sustainability certification, expanding certification to ecosystem services	Includes ecosystem services in certification, process orientated	Pilot, multi-stakeholder
Dutch Public Procurement Policy	EU & Government driven	GFTN and TPAC as a multi-stakeholder platforms	Framework conditions, regulations to drive innovations in chains	FSC and PEFC certification standards
Reducing Emissions from Deforestation and Forest Degradation (REDD+)	International, NGOs, national policy	Multi-stakeholder platforms	Mix of finance, policy practice & research, resource focused	Pilots, learning orientated, Specific mention ecosystem services

For each of the cases, the following structure was used:

- Actors, learning, innovations and issues were mapped using the document review and snowball method;
- The main discourses were constructed from the frames and reoccurring themes in the literature and interviews;
- The innovation (relating to Ecosystems services) and its history are briefly described;
- Triggers (what stimulates/induces the innovation process), drivers (what keeps the innovation going), opportunities and barriers are described;
- Process dynamics (rules of the game) were constructed from the document analysis (formal rules); interviews, media and web data and include power, conflicts;
- Learning processes.

1.4 Outline of this document

This document presents the outcomes of the analysis of governance options for stimulating ecosystem services in the tropical timber chain, guided by an integrated innovation system and value chain approach. The conceptual framework and concepts used in the analysis are outlined in Chapter 2. Chapter 3 then links theory to practice. It contains a discourse analysis of how ecosystem services are discussed and integrated into current Dutch policy. An overview of the tropical timber chain is provided in Chapter 4 before the four specific cases of innovation in the tropical timber value chain are discussed in Chapter 5. The final chapter, Chapter 6, refers back to the research questions and makes recommendations for how ecosystem services can be more integrated into Dutch policy and practice with regard to international value chains.

2 Conceptual approach and methodological framework

2.1 Introduction

This chapter outlines the main concepts drawn upon to develop the methodological approach and the methodological framework for conducting the value chain innovation cases.

2.2 Ecosystem services

The cornerstone of the conceptual approach is based on an understanding of ecosystem services. These are the transformation of a set of natural assets, such as soil, plants, animals, air and water into 'services' that people value. Humankind benefits from a multitude of these assets and the processes supplied by natural ecosystems. Collectively, these benefits are known as **ecosystem services**, the term being popularized and their definitions formalized by the United Nations 2005 Millennium Ecosystem Assessment (MEA) (Millennium-Ecosystem-Assessment, 2005). The MEA grouped ecosystem services into four broad categories: *provisioning* (also known as goods), *regulating*, *supporting* and *cultural*, shown in Figure 2.

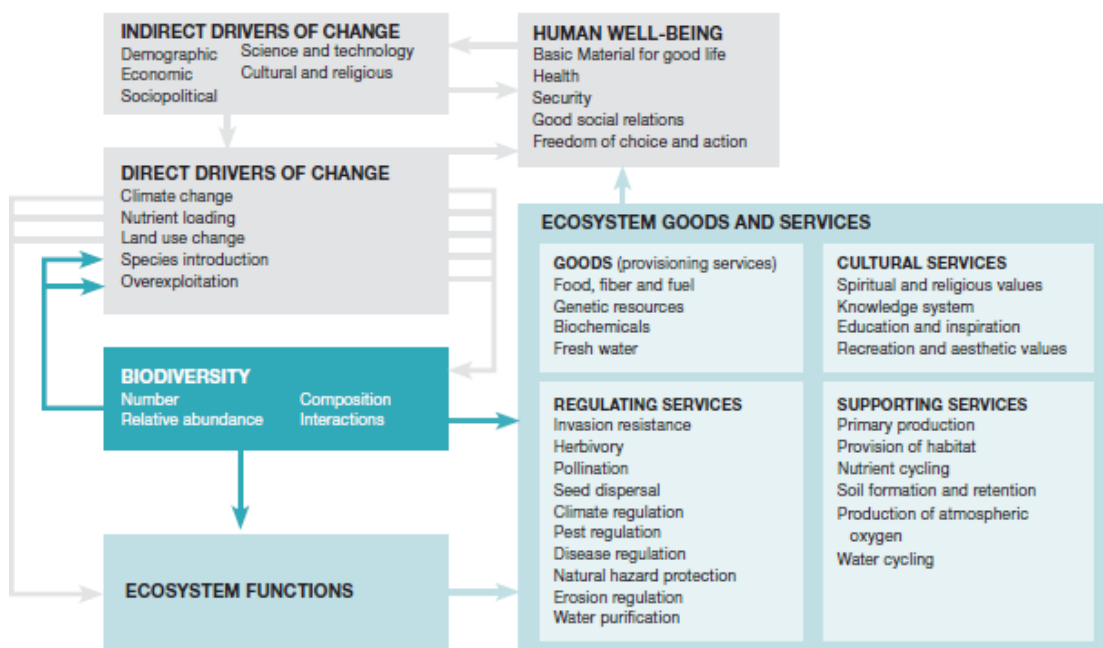


Figure 2 Ecosystem services and drivers of change (Source: Convention on Biological Diversity (CBD)²)

Provisioning services or goods, such as food and timber, may be produced or managed intentionally for direct consumption or sale. Buyers and consumers can influence their production through market mechanisms and governments through regulation. Other ecosystem services may be provided as externalities³, in that they are unintended consequences of primary land management activities. Many

² <http://www.cbd.int/doc/bioday/2008/ibd-2008-factsheet-01-en.pdf> retrieved 7 August 2012.

³ An externality is a cost or benefit resulting from an economic transaction that is borne or received by parties not directly involved in the transaction. An externality occurs when the consumption or production of a good impacts on people other than the producers or consumers that are participating in the market for that good. Externalities can be either negative (e.g. water pollution caused by industrial production) or positive (e.g. agriculture maintaining the countryside and rural communities).

ecosystem services have the characteristic of public goods⁴, as people usually cannot be excluded from benefiting from them and the use of the service by one person does not diminish the availability of that service to other users. Human activities may degrade the capacity of ecosystems to maintain the supply of these services, by changing the composition and the structure of a system and how it works, or by extracting material from the ecosystem at a rate above its replenishment capacity.

A number of drivers (both direct and indirect) of ecosystem degradation and change are shown in Figure 2. One important driver is the combination of a perception that many of nature's services are "free" and not owned or managed and the fact that our economic systems do not cope well with public goods and services. As a result, there are no direct market mechanisms to signal the scarcity or degradation of many ecosystem services until they fail, at which point the non-market value of public goods becomes obvious because of the costs of alternatives or restoration or replacement costs. This is one of the reasons why estimates indicate that a significant number, up to 70%⁵, and the quality of the planet's regulating services are in decline (KPMG, 2012). To reverse this trend, it has been argued that the production of negative and positive externalities resulting from current management of ecosystems should be explicit, which was one of the aims of the MEA. To do this, the services and their importance need to be valued. A growing body of studies over the last fifteen years has attempted to do this, although the methods, measurement and ethics remain hotly debated (Ministry of Forestry and Wildlife, 2010). There are a range of mechanisms (planning, policies and regulations, institutions, markets and payments) that can be used to operationalize trade-offs and balances between different goods and services, ecosystem functions and impacts on biodiversity across time and space (McNally, 2009; Gradl and Jenkins, 2011). It is these types of mechanisms that the tropical timber value chain innovation cases, presented in Chapter 5, seek to investigate.

Biodiversity is a property of an ecosystem and at the same time an ecosystem output valued by humans as an ecosystem service in itself. It is just one component of ecosystem services (see Figure 2) and it is very often associated in Dutch policy documents with biodiversity conservation and sustainable trade chains. Veeneklaas (2012) highlights that the relationship between biodiversity and ecosystem services is not straightforward. A low biodiversity is not the same as a low provisioning of each ecosystem service and a low income. Conversely, high biodiversity rates do not always necessarily produce useful goods or services for people. Similarly, the maintenance of ecosystem services does not necessarily preserve biodiversity. For instance, carbon sequestration mostly depends on biomass production, and higher species numbers do not automatically lead to ever increasing amounts of biomass (there seems to be a saturation level). The exact relation is a much debated subject in the literature (Cardinale *et al.*, 2011).

In policies relating to climate change (Ministry of Foreign Affairs, 2010), the Dutch Ministry of Foreign Affairs states that the Netherlands is guided by an 'ecosystems approach', which pays equal attention to ecological, social and economic aspects. The term is further used in relation to specific Dutch policy on REDD, which are seen "as an important opportunity for developing countries, the main objective of which is to improve the livelihood of local communities and promote co-benefits such as biodiversity conservation and the protection of ecosystem services" (Ministry of Foreign Affairs, 2010: 4). Biodiversity can thus be seen as an indirect indicator of attention to ecosystem services in policies, as biodiversity underpins the four categories of ecosystem services in different ways (TEEB, 2010:7). This narrow focus and confusion between biodiversity and ecosystem services contributes to the justification of the conceptual approach applied in this study an approach that takes a broad perspective on ecosystem services in international value chains, taking governance options into account, one of the research areas in need of attention.

⁴ Public Goods are non-rival (consumption of the good by one does not reduce the amount left for others) and non-excludable (individuals cannot be excluded from consuming the good). Many ecosystem services provide non-rival and non-excludable benefits.

⁵ http://www.fao.org/ecosystem_services/esa/pesal/aboutPES2.html# retrieved 7 August 2012.

2.3 The problems and opportunities of addressing ecosystem services

The metaphor of nature as a stock of resources providing a flow of services has caught on widely in policy, business, conservation and development agendas. Each year, it is estimated that global land-based ecosystem services losses alone have a value equivalent to around € 50 billion. This loss has important implications for the long-term viability of the businesses dependent on these services, in particular those with chains based on ecosystem services (TEEB, 2009). One of the main challenges is to capture this lost value in some way, adding value to the sustainable management of ecosystems and the maintenance of the services they provide. Economic valuation (commodification) of ecosystem services and biodiversity (Balmford *et al.*, 2008) has gained enormous ground, with the broadening of TEEB's scientific, business and policy coalitions and partners good example. This has increased the visibility of ecosystem services in policy. The commodification of ecosystem services has also led entrepreneurs and organisations to promote new business models such as selling individual, segregated ecosystem services in specialist or niche markets, such as carbon, or bundling them together. Payments for ecosystem services (PES) has been seen as an innovation in the last decade, a new policy and business model to reduce poverty and achieve the maintenance of ecosystem services. In practice however such schemes have often been problematic and have not offered silver bullets, being highly dependent upon the 'right' pre-conditions and riddled with thorny questions of ethics, equity, efficiency and efficacy, leading to the PES model being questioned (Pagiola *et al.*, 2005; Wunder, 2006; Bulte *et al.*, 2008; Pirard, 2010; Pirard *et al.*, 2010).

While valuation is difficult and risky when many ecosystem services do not have market values, other methods such as shadow prices, willingness to pay and opportunity costs can produce widely varying values (Pirard, 2010). This has led to debates about the best methods to use to value ecosystem services, which in part are determined by the nature of these services (Fisher *et al.*, 2008). Production services, such as water and fuel have been easier to value in economic terms, however when the ecosystem processes are not well understood and different valuation methods produce different results, valuation can lead to inaccurate and debateable values. Experiences in the Netherlands also show the difficulty in assigning monetary values to ecosystem services. Examples such as re-flooding river areas (Bos and Vogelzang, 2010) mirror experiences in valuing tropical forests (Peters *et al.*, 1989). Another difficulty that also speaks to the attractiveness of the concept is the extent to which ecosystem services meet social needs and the costs and benefits of using them (Fisher *et al.*, 2008; Bauhaus *et al.*, 2012). One of the reasons for the difficulty of their valuation, use and management is the trade-off between costs and benefits for different users. Different groups have different requirements, and there are different levels at which use, costs and benefits occur (Raudsepp-Hearne *et al.*, 2010). Decision-making processes about balancing and managing these trade-offs are affected by negotiation skills, power and equity and involve not just user groups but also have highly political North-South/developed-developing dimensions. Norgaard (2010) points out the need to take future generations into consideration, *"internalizing externalities can still result in resource consumption and ecosystem degradation, however if future generations (or current generations) do not have rights or if their rights are not represented in today's markets, the challenge of using and maintaining ecosystem services will be difficult to meet, and this challenge may not necessarily be met by only thinking in terms of markets and commodification"*.

A positive impact of this recognition and attempts to value ecosystem services has been the increasing consciousness of humankind's environmental dependence on these services (Daily and Matson, 2008). A consequence has been expanding (inter)national consensus, evidenced by the adoption and subsequent adherence to the MEA (2005) and TEEB (2008) along with conventions such as the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the EU target on national ecosystem accounting for 2015 (EU Biodiversity Strategy – target 2 Action 5). From 2010, a broadening attitude to ecosystem services has been evident in Dutch policy (VVD CDA coalition agreement 2010), a prime example being the Beleidsprogramma Biodiversiteit 2008-2011.

Something else to take into account when discussing the valuation of ecosystem services is the notion of increasing costs for sustainable forest management. In a study on certification costs in Cameroon and Indonesia, the costs for improving forest management were found to be too high for building viable business cases based on voluntary certified markets for timber products alone. One way of tackling this barrier for further growth in sustainably managed forests is the introduction of legality rules (see EUTR), as that will increase the minimum standard of forest management for all operators (see IDH position paper on mainstreaming sustainability in tropical timber, it refers to PWC report/not available yet). Another way of tackling this barrier may be the valuation of ecosystem services.

2.4 Political ecology

Political ecology has been used to study the relationships between political, economic and social factors with biological, environmental issues and changes and the interactions between the state, non-state actors, and the physical environment (Blaikie, 1985; Bryant and Bailey, 1997). The concept explicitly politicizes environmental issues and phenomena. By analysing conflicts over resources and their links to the larger political-economic processes and environment-development discourses, control over natural resources within political arenas on various scales can be shown. This is particularly relevant for value chain approaches where local and global contexts and policies affect ecosystem services. Political ecology's broad scope and interdisciplinary nature means that there are multiple definitions and understandings of what it means.

Bryant and Bailey's (1997) underpinning of relationships are used to guide this study. These are threefold: costs and benefits associated with environmental change are unequally distributed, changes in the environment affect society in a heterogeneous way such that political, social and economic differences (between people: over nature, over other people) account for uneven distribution of costs and benefits. This unequal distribution inevitably reinforces or reduces existing social and economic inequalities with any change in environmental conditions affecting the political and economic status quo; and the unequal distribution of costs and benefits and the impact on pre-existing inequalities has political implications in terms of the resulting altered power relationships.

The relationship between poverty and environmental degradation can thus be seen as a function of uneven access to ecosystem services. Multi-level connections between local and global phenomena, with causes at multiple levels of scale are highlighted (Adams, 2009). Political driving forces at various scales have been found to play a significant role in local level institutional functioning. In particular, inappropriate interventions into land use planning can weaken local level institutions, and reduce the ability of the linked social-ecological system to cope with change and uncertainty (Cundill and Fabricius, 2010). Therefore for this study, (access to) power and the control of ecosystem services by actors at different stages in value chains and the resulting costs and benefits are particularly relevant.

2.5 Innovation and innovation systems

An innovation is different from an invention. An invention is new knowledge and technology, while innovation is the use or application of the invention for economic, social and environmental benefit. Innovations are not only new technologies, but refer also to new ways of organizing things (e.g. production-market-consumer relations and chains) and to changes in the political-institutional environment (e.g. regulations and incentives, and creation of new markets). Innovation thus refers to 'new ways of doing things'.

For this study, the term innovation is used from a value chain governance perspective. The focus of research is on the relationships between chain actors and the rules governing interactions (institutions) and learning processes. The term innovation is used to describe the process of innovation (and not the output of that process) and refers to 'new ways of doing things' in value chains. Thus innovation aims - intentionally or unintentionally - to integrate ecosystem services into international value chains. Innovations are possible in policies and institutions, in corporate business models, in products, in processes and in mechanisms such as collective action (for example by producers).

Innovation Systems (IS) refers to the characteristics, conditions and patterns typical for stimulating, engineering or enhancing innovation, which can be used to formulate and evaluate policy (Almekinders *et al.*, 2012). C. Freeman (1987) places more of a focus on technological innovations, describing IS as a network of institutions in public and private sectors whose activities and interactions initiate, import, modify, and diffuse new technologies. An IS perspective is useful to assess past and on-going innovation processes and to propose improvements in the way different chain actors interact and work together to achieve mutually desirable changes in response to technological changes and changes in the political, economic, ecological and social environment. A number of schools of thought on IS exist (shown in Table 2), with a common theme being that innovation can be enhanced by bringing together different actors, stimulating feedback and learning from each other. Much of the IS thinking is analytical and focuses on dynamic contexts and the interactions taking place. This literature provides an analytical framework that focuses on the development of relations between actors and organizations, the functions and characteristics of networks from which innovation emerges, and critical moments/events/factors in the course of the innovation processes.

Table 2 Schools of thought on innovation systems (Source: Almekinders *et al.*, 2012)

	Technology change	Sustainable technology	Alternative food chains	Knowledge Studies	Farmer-driven, bottom-up	Multi-stakeholder, broker, etc.
Prominent actors/advocates	Research (Callon <i>et al.</i>)	policy supporting research (e.g. Schot, Geels, etc.)	Research (e.g. Brunotti, Wiskerke <i>et al.</i>)	Anthropology & related fields of research	Critical researchers-practitioners (PROLINNOVA)	researchers-practitioners (e.g. KIT, CDI)
Perspective	network dynamics, socio-technical processes	Sustainability & regime shifts	Sustainability & regime shifts in European Agriculture	Understanding knowledge	Improved practices	Learning based approaches, role of learning
Scientific/methodological approach	Actor Network Theory, path dependency, technological cultures	Strategic Niche Management (analysis at macro-meso level processes)	Strategic Niche Management (analysis at meso-micro level processes)	Situated knowledge, knowledge cultures, boundary objects, local and scientific knowledge	Documentation and sharing, aiming directly at operationalization of lessons (awareness/change/impact)	Design orientation of multi-stakeholder processes
First audience	scientific community	Scientific community and policy	scientific community	scientific community	researchers, practitioners and policy makers	researchers and practitioners

Relevant to this study are innovation platforms which use intermediaries or brokers to enhance systems and processes (Howells, 2006) by facilitating - intentionally or unintentionally - interactions between actors that would otherwise not connect or connect less effectively. Platforms, as 'spaces' where actors meet, can be formal or informal, functioning as 'hubs' or 'nodes' for information exchange, coordination and planning mechanisms. Studies indicate that they are particularly present in stimulating innovation in developing countries (Adekunde *et al.*, 2012) with the premise that if different stakeholders are brought together their interests can be aligned and/or more easily

accommodated resulting in an increased likelihood of innovation. Well documented studies of how such platforms and the knowledge dynamics around them enhance innovation are difficult to find outside of the value chain literature, where the focus is on mutual interests and brokers bringing actors together, making them aware of how their interests are aligned (Te Velde *et al.*, 2006; Purnomo *et al.*, 2008; Devaux *et al.*, 2009)

2.6 Value chains

The concept of value chains (also known as market or supply chain, production to consumption system, production system and *filière*) has a long tradition, especially in economics and industrial production and has been used to analyse the dynamics of markets. The value chain concept is useful to understand the activities involved in bringing a product from its origins, whether farmed or natural, through processing and production, to delivery to final consumers and ultimately disposal (Kaplinsky and Morris, 2000). Value chains are diverse and can be locally nationally or internationally oriented and include activities such as harvesting, cleaning, transport, design, processing, production, transformation, packaging, marketing, distribution and support services. This range of activities may be implemented by various actors, from primary producers, harvesters, processors, traders, service providers and upstream suppliers, and may also be known as a value system. The term 'value' makes explicit the series of value-generating activities in a chain as it is transformed from its source to final consumer. Products embody and carry with them multiple relations of value – often explicitly economic but also social, cultural and environmental. Value chains can be used to investigate governance, particularly the interactions, relationships and power between chain actors (Humphrey and Schmitz, 2001).

Value chain analysis is a conceptual framework for mapping and categorizing the economic, social and environmental processes in product value chains, helping to create a better understanding of how and where enterprises and organizations are positioned in chains and identifying opportunities and possible leverage points for upgrading. It encompasses the organisation, coordination, equity, power relationships, linkages and governance between organisations and actors (Helmsing and Vellema, 2011). Value chain approaches help orient policy makers (intervention thinking) towards an innovation system approach.

The concept of 'governance' is central to the global value chain approach and has been used to refer to the relationships and institutional mechanisms through which non-market coordination of activities in a chain take place (Humphrey and Schmitz, 2001). Coordination is achieved through the setting and enforcement of product and process parameters to be met by actors in a chain. In global value chains, buyers often play an important role in setting and enforcing these parameters. They set these parameters because of the (perceived) risk of producer failure. Product and process parameters are also set by government agencies and international organisations concerned with quality standards such as environmental standards (i.e. ecosystem services). Humphrey and Schmitz (2001) postulate that as external parameter setting and enforcement develop and gain credibility, the need for governance by buyers within a chain declines.

Governance arrangements can be seen to run along a continuum of styles depending upon the public goals – from government regulation, where public goals are the main focus, to closed co-governance, where a coalition adopts public goals, to open governance, where public goals are negotiated, to market governance, where public aims are coupled with business interests, to self-governance, where common goals are scaled up to public goals or coupled to them (Arts, 2002). These new and hybrid forms of governance can occur in alliances between public, private and civil society actors. In general governments have four main different policy instruments that can be and are used to influence forestry activities in a country, shown in Table 3.

Table 3 Policy instruments. Inspired by (Van Tulder 2008; Vermeulen and Kok 2012; FAO, 2010: 127)

Instrument	Endorsing	Partnering	Facilitating	Mandating
Level of state dependence	Dependent	Interdependent		Independent
Principle	Corporate self-regulation	Semi-private regulation	Semi-public, interactive regulation	State regulation
Interventions	Political support; publicity and praise; labelling; support civil society initiatives; publishing 'best practices'; supporting voluntary labelling	Combining resources; stakeholder engagement; Dialogue; Public Private Partnerships; covenants	'Enabling legislation'; Strategic stakeholder dialogue; awareness raising; incentives, subsidies, tax rebates; procurement policies; capacity building; supporting spread of labels; self-governing agencies	Coercion, 'Command and control' legislation; regulators and inspectors; legal and fiscal penalties and payments e.g. transfer payments, grants tax regimes; public labels and safety standards; anti-trust rules; policies in education, military, direct action, infrastructure.
Corporate governance/ codes	Own responsibility: CSO and market initiated, voluntary codes and reporting; peer reviews/pressure	Multi-stakeholder code development; Shared monitoring, Govt. or market/CSO initiated, shared incentives	Implementing international principles; reporting stimuli/guidelines, internalisation, incentives	Stock exchange regulations and codes; company law ; mandatory reporting and disclosure rules

Innovation can occur at all stages of a chain and can be driven by different actors and different configurations of governance arrangements and can be better understood by knowing the position and behaviour of actors in a value chain (Gereffi *et al.*, 2005; Te Velde *et al.*, 2006). For example, lead firms or actors with significant power are able to coordinate and control value chains, depending on the mode of value chain governance (Gereffi *et al.*, 2005). This implies that there are multiple levers or 'intervention' points and angles possible, whereby creating new configurations of information, power and control can be essential in stimulating innovation and change. A number of studies point to different sources of innovation in value chains that can have positive impacts on sustainability, with sustainability being used as a proxy for outcomes and impacts of innovations in regard to ecosystem services.

These studies include:

- Policies can create an innovation-enabling environment for enterprises in forestry and the forest-based industries (Weiss *et al.*, 2011);
- A focus on sustainability as a driver of innovation (Nidumolu *et al.*, 2009);
- Encouraging entrepreneurship (Te Velde *et al.*, 2006);
- Role of intermediaries (Howells, 2006);
- Enhancing and supporting collective action (Devaux *et al.*, 2009);
- Partnering and partnerships, including platforms (Bitzer *et al.*, 2009; Adekundu *et al.*, 2012; Ravikumar *et al.*, 2012);
- Product innovation as a driver (Kaplinsky *et al.*, 2003);
- Creating 'positive deviance' situations and building on experiences (Biggs, 2007);
- Changes in governance arrangements in chains – particularly which simplify access to information (Gereffi *et al.*, 2005);
- Standards and standardisation (Gereffi *et al.*, 2005).

Drawing on Berdegué and Peppelenbos (2005), the following variables appear critical to analysing innovation in value chains:

- The meso and macro context (see Section 2.7) which influences value chain actors;
- The strategies (i.e. business models) actors employ) in value chains - including stakeholder (e.g. standards) organisations and procurement policies;
- Concrete incentives (i.e. the drivers) that encourage the chain to undertake innovation (e.g. in technology, management, inter-firm organization);
- How the innovation evolved and emerged over time, and critical stages and success factors in this evolution.

Addressing ecosystem services in value chains

The incorporation of ecosystems services thinking into value chains is relatively recent and the literature is scarce. Christensen *et al.* (2011) use a combined ecological and economic approach, aimed at giving equal emphasis to both disciplines. It is integrated into their study design, analysis, data entry and storage, results and analysis tool. They link the tropic ecosystem model to a value-chain approach to track the flows (amounts, revenue, and costs) of fish products from the sea through to the end consumer in order to assess the social aspects of fish production and trade (by evaluating employment and income diagnostics).

Approaches to increase the sustainability of value chains – notably certification schemes, corporate social responsibility and risk management and mitigation initiatives – (indirectly) address many ecosystem services (Grigg *et al.*, 2009; Soto *et al.*, 2011; Weiss *et al.*, 2011). There are also a number of multi-actor activities addressing how biodiversity is integrated into business and value chains, such as the EU Business and Biodiversity platform, the UNDP protecting biodiversity in working with agribusiness project (Leibel, 2012), the IUCN Global Business and Biodiversity Program (BBP) (Bishop *et al.*, 2008), the Business and Biodiversity Offsets Program (BBOP), the Biodiversity in Good Company' Initiative and in the Netherlands, the Business meets Biodiversity conference organised by Utrecht University⁶. These initiatives and studies highlight that limits of market based approaches for value chains, including for forest product chains, which range from unorganized and powerless workers to difficulties in product commercialization and undeveloped demand for certified products among businesses and consumers. The process of creating certification standards can however create positive ripple effects along a chain towards more socially and environmentally responsible management of ecosystems (Pierce *et al.* 2003; Shanley *et al.*, 2008; Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, 2012).

2.7 Methodological framework

In this section the methodological framework for the innovation case studies is presented, drawing on the multi-disciplinary concepts of political ecology, innovation systems and value chains. As mentioned earlier innovation refers to 'new ways of doing things' in international value chains which - intentionally or unintentionally, directly or indirectly - integrate ecosystem services.

The central idea of this study is that the structure and processes in innovation systems are critical determinants in creating innovations in value chains, for example in making complex chains - characterised by natural resource-based international commodity value chains - more sustainable. If it is known how the innovation systems in a value chain function, the potential leverage points in a value chain can be identified for intervention. Innovation is a dynamic process, involving multiple actors, institutions and learning processes, all of which interact with framework conditions such as policies and regulations, demand and the wider political system. These framework conditions provide windows of opportunity for innovation. Therefore, a methodological framework that focuses on both

⁶ <http://www.uu.nl/faculty/geosciences/EN/bmb/Pages/default.aspx>

the structure of the innovation system and the dynamics of the innovation processes and how these interact with the value chain actors (their relationships, processes, institutions) is proposed. This allows ecosystem services (as innovations) to be analysed and the pathways or windows of opportunity for intervention to be addressed. These interactions are shown in Figure 3.

Learning is considered as a critical process for developing a conducive fit between innovations and their environment (Leeuwis and Aarts, 2011). Learning is interactive and thus a socially embedded process that cannot be understood without reference to its cultural and institutional context (i.e. the framework conditions) (Johnson and Lundvall, 1992). According to Beers *et al.* (2010) social learning is a dynamic process in which three learning outcomes are continuously produced: a shared frame, mutual trust and commitment. These outcomes simultaneously influence how the learning process evolves. A shared frame increases with the level of commitment that a stakeholder has to the process. In principle every occasion in which groups communicate offers learning opportunities, although social learning is associated with trust, social cohesion and collective action, it does not occur automatically (Leeuwis and Aarts, 2011). In this study, the focus is on learning processes between chain actors (individuals and organisations) related to innovation within a shared frame.

Framework conditions, also shown in Figure 3, concern the meso- and macroeconomic context in which value chains operate and are embedded. This includes such things as the macroeconomic environment (including the socio-economic, regulatory, institutional and political environment); market demand and consumer characteristics and trends; the business operating environment and the structure, composition and degree of evolution of the production systems. The business operating environment refers to the context in which a chain operates commercially. It can impact upon how a chain operates, for example the degree of corruption and ease of doing business. As Figure 3 illustrates context-related issues provide a range of opportunities for innovation (ecosystem services) in value chains. Integrating ecosystem services into value chains can be considered as a way or as part of the way towards sustainable development besides improvements in areas such as energy efficiency and lower waste production processes, amongst others.

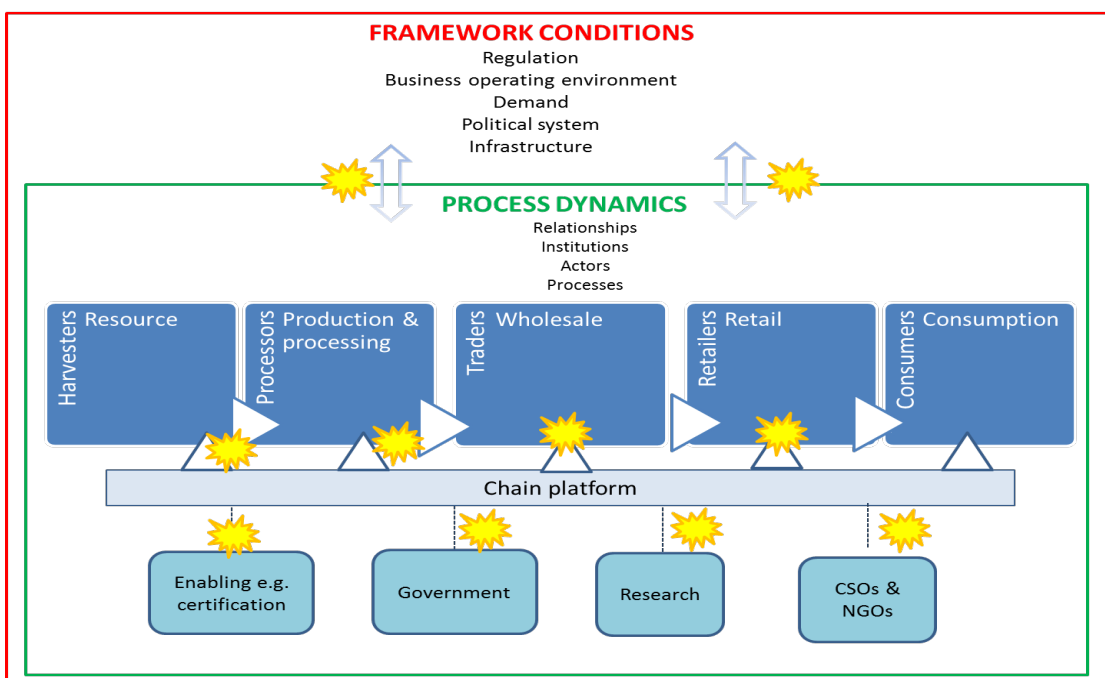


Figure 3 Conceptual framework combining innovations systems and value chains
 Note: the yellow stars indicate 'innovation windows of opportunity': places and processes in a value chain where innovation can occur

The study concerns the entire chain – represented by a number of main stages, including the natural resource base (forests, plantations and agro-forestry in the case of the timber chain) – its actors and their relationships. Actors include indirect actors such as regulators, enabling organisations such as certification bodies, research and development actors, stakeholders such as employers, employee associations, NGOs and civil society organisations. They also include platforms or networks of organisations that are concerned with and play a role in the operation of the chains and discourses concerning its operation and governance.

3 Dutch policy discourse on ecosystem services and international value chains

3.1 Introduction

This chapter presents an analysis of the Dutch policy discourse on ecosystem services and cross-sector collaboration for sustainable value chains. The aim is to identify the assumptions underlying current policies to increase the sustainability of international trade. The methodology used is provided in Annex 1. The review of Dutch policies included the role of businesses, NGOs, knowledge institutes and their collaborations. Section 3.2 addresses the way in which ecosystem services are discussed in policies covering sustainable value chains. It describes why it is an issue, and the causes and effects. Section 3.3 presents how ecosystem services are framed in policy and Section 3.4 specifies how the government frames its role, responsibilities and collaborations with other parties in society. Finally Section 3.5 summarizes the Dutch policy discourse on sustainable value chains and ecosystem services.

3.2 Ecosystem services: a policy void

A review of policy documents from 2007 onwards on the topic of sustainability of commodity chains revealed seven policies, presented in Box 2. A review of the content and keywords indicated that the Netherlands does not have specific policy on ecosystem services. The main policy document providing the most extensive information on ecosystem services is the 2008-2011 Biodiversity policy 'Biodiversity works for nature for people forever', which is also the oldest of the documents included in this analysis. Ecosystem services are introduced in the document with reference to the Millennium Ecosystem Assessment.

"On a global level the Millennium Ecosystem Assessment has proven that biodiversity and its corresponding ecosystem services are increasingly threatened.... This threat is caused by changes in land use, climate, introduction of exotic species and overexploitation and pollution, which are driven by population growth, wealth increase and globalisation".

Box 2 Dutch policy documents concerning ecosystem services

Responses to external policy and advice.

1. Letter from the Ministry of EA in response to the advice of the Taskforce Biodiversity and Natural Resources (EL&I 2012)
2. Letter of appreciation of the Ministry of EA concerning the European Biodiversity Strategy (EL&I 2011)

Policy documents addressing commodity chains and/or ecosystem services.

3. Government Commodity note (Kabinet 2011)
4. Government Sustainability agenda, a green growth strategy for the Netherlands (I&M 2011)
5. Biodiversity Policy 2008-2011 "Biodiversity works for nature for people forever" (LNV 2008)

Policy documents on governance and collaboration.

6. Background document for the budget of the Ministry of EA 2011 (Tweede Kamer 2011)
7. Government vision on governance and administrative structure (BZK 2011).

What is remarkable is that the term biodiversity is explained while the term ecosystem services is only explained by examples such as *"basic processes that make life on earth possible, such as the production of clean air and biomass, the maintenance of food and water cycles and the buffering of*

the climate system.” The relation between ecosystems and biodiversity is not further addressed. In the policy program on biodiversity for 2008-2011, the maintenance of ecosystem services is presented in the ten objectives of the EU Biodiversity strategy 2020, one of which refers to international trade: “*Substantive decrease of the impact of international trade on global biodiversity and ecosystem services.*” The way in which ecosystem services are positioned in the biodiversity program indicates that it is partly an externally driven objective of the EU (see Table 4).

Table 4 Priority objectives in policy program on biodiversity for 2008-2011

Priorities	Description	Orientation
Trade chains and biodiversity	Making the trade in timber, soy, palm oil, biomass and peat sustainable.	International
Payment for biodiversity	Creation of markets and payment mechanisms for biodiversity and ecosystem services (the user pays)	National and international
Biodiversity works	Formulate policy for ecosystem services in land use and promotion of the use of biodiversity in (agro)production processes	National and international
Ecological Networks	Creation of ecological networks within a broader eco regional development.	National and International
Marine biodiversity and sustainable fisheries	Conservation and sustainable use of seas and oceans	National and international

The focus on making value chains more sustainable is only related in these policies to impacts on biodiversity. Ecosystem services are however mentioned in the national priority to create markets and financing mechanisms: ‘the user pays’. The term ecosystem services are dominantly positioned in combination with payment and financing mechanisms. The way in which ecosystems are positioned in the 2008-2011 biodiversity policy is confusing in that sometimes objectives are only related to biodiversity and other times to ecosystem services or both. It is not clear why certain objectives (such as incorporating the impact of value chains on biodiversity) are only related to biodiversity and not to both biodiversity and ecosystem services. Considering the type of policy objectives related to biodiversity and/or ecosystem services, ecosystem services are only associated with solutions and actions concerning pricing, while objectives including biodiversity also include conservation and sustainable trade chains.

The Biodiversity Policy Program 2008-2011 further addresses the causal interpretations concerning ecosystem services in the policy discourse, stating:

“One of the underlying causes of biodiversity loss is the public character of biodiversity. In many cases everybody can access it, it is for free. This relates to the low recognition of the meaning and value of ecosystem services and the lack of sufficient financing mechanisms for this. The costs of production for biodiversity are not incorporated into the prices of products. This mostly leads to exploitation and omitted investments in the conservation of the capacities of ecosystems to produce goods and services (‘tragedy of the commons’).”

Specifically related to value chains, the policy states:

“In developing countries applies above all that the poorest are the most dependent upon natural resources, but do not have sufficient financial means to invest in sustainable management. Given biodiversity a more explicit place in economic and monetary considerations is thereby directly related to poverty alleviation.”

These two quotes indicate that the degradation of ecosystem services is framed as an economic deficit and that investments in the incorporation of biodiversity into economic considerations are related to poverty alleviation. More recent documents indicate a change in the description and causal interpretation of ecosystem services. In the government's reaction to the advice of a multi-stakeholder platform on biodiversity (The Biodiversity Taskforce) it is stated:

"In addition to its intrinsic value, biodiversity and the accompanying ecosystem services have an important economic value. The Dutch government supports this approach: biodiversity provides us with much. The worldwide deterioration of ecosystems and ecosystem services (the life support system) can form a hindrance for sustainable economic growth. That's why it is of importance to incorporate the economic value (of the conservation and sustainable use) of biodiversity into decision making and join-up with global decision making processes in this area."

In the Commodity Note, the government describes the future threat of a scarcity of biotic and a-biotic commodities. Their problem description is:

"The current market organisations insufficiently based on wealth on the long term. The environmental impacts of production and overexploitation are insufficiently incorporated into the price."

Ecosystem services according to the vision of the Ministry of Economic Affairs (EA) (the vision that was accompanied by the 2011 budget of the Ministry) are seen as:

"A competitive economy with a versatile nature is of crucial importance for a sustainable society, in the short and long term. The economy is the motor of our prosperity. Nature, biodiversity especially, is the basis for our primary necessities: (drinking) water, food and oxygen. Nature has a big economic value: it produces commodities and ecosystem services and is one of the aspects of the business climate for the settlement of international companies. A sustainable connection between economy and ecology is essential to also secure the level of wealth and welfare in the future."

These policy documents again highlight the idea that ecological degradation is caused by the lack of pricing of these environmental externalities. Different interpretations in these statements relate the ecosystem services to the achievement of economic growth, wealth and welfare, an enabling business environment and economic competitiveness. The commodity note also uses the term natural capital, rooted in economic jargon. These documents make a much stronger causal interpretation of the lack of accounting for ecosystem services due to economic interests, while the policy program on biodiversity addresses pricing and putting value on ecosystem services without mentioning economic objectives such as increasing growth or wealth.

3.3 Strong policy belief in market-driven solutions

This section assesses how ecosystem services are presented in policy documents. In the Biodiversity Policy Program 2008-2011 the priority objectives are directly related to the economical mechanisms that lead to biodiversity loss:

1. Better division of benefits and access to biodiversity and natural resources, where ownership or user rights are maintained.
2. The clear pricing and payment of products and services provided by ecosystems. Markets for biodiversity and related goods and services offer opportunities for sustainable use. This is where big opportunities lay, among others in relation to international agreements on the reduction of climate change by prevention of deforestation and the degradation of peat lands.
3. Setting demands on (maintaining) unsustainable seizure of biodiversity by, for example, compensation.

The most emphasized aspect of these solutions is that ecosystems and biodiversity are referred to by their benefits, pricing and payment. The financial markets for ecosystem services are framed as an opportunity, similar to the other policy documents. In the governments reaction to the European biodiversity strategy 2020, it is stated that the *“the Dutch cabinet shares the analysis that conservation and sustainable use of biodiversity and ecosystems is not only urgent, but also - and especially now- offers opportunities to arrange the economy in a future resistant way.”*

In the Commodity Note the government identified three main approaches to solutions:

1. To secure, enlarge and make the supply of commodities more sustainable.
2. To reduce demand and where possible make it more sustainable.
3. To make the use of commodities more efficient and sustainable.

Even though sustainable value chains are mentioned under approach 3, ecosystem services are only addressed under point 2. In response to its problem description on the lack of incorporation of environmental costs in prices, the Dutch government committed to stimulate payment of biodiversity and ecosystem services by means of the Economics of Ecosystems and Biodiversity (TEEB) study for the Netherlands. This solution is also directly incorporated into the Dutch sustainability agenda, where it specifically stated that the Dutch government wants to incorporate the costs of ecosystem services into the decisions that are taken by the government, businesses and the consumer. Also in this document the scarcity of commodities is framed as an opportunity:

“Moreover the scarcity of commodities is seen as an explicit opportunity. The Cabinet wants to stimulate innovation, re-use and substitution so that the Netherlands within Europe will play a leading role. This can have a strengthening effect for the economy and our competitive position.”

The commodity note also explicitly states the government’s vision on the impact of Dutch businesses on biodiversity:

“The cabinet wants to further reduce the impact of Dutch businesses on international biodiversity by encouraging innovation that through export can contribute to solutions elsewhere and simultaneously strengthen the competitive position and growth of the Dutch economy with special attention for the top-sectors.”

The commodity note also implies that investments in sustainable land use in developing countries through development cooperation may lead to:

“Sustainable development of the country, which forms a basis for more trade and increased transparency in a stable commodity supply with low price volatility and thereby serves a direct Dutch interest.”

These quotes indicate that the perspectives for ecosystem services are clearly market-led, related to valuing and pricing. The investments made in innovation in the sustainability of value chains is seen as a direct interest for the export of commodities to the Netherlands, while on the other hand, innovations in sustainability by Dutch companies could be exported to other areas. It is notable that the pricing solution is strongly framed as an opportunity, if investments in innovation for sustainable value chains are made. A recent announcement at the Rio+20 summits and on the Ministry of Foreign Affairs website on June 20 2012⁷ was the investment in natural capital accounting. The Netherlands aims to promote the use of economic indicators that put a price on the ‘services’ provided by nature (ecosystem services) to establish the real price of goods (externalising internal costs), by investing €2 million in the World Bank program ‘Wealth Accounting and Valuation of Ecosystem Services’ (WAVES) project to promote the use of these international indicators by

⁷ <http://www.minbuza.nl/en/news/2012/06/the-netherlands-to-invest-in-natural-capital-accounting.html>

developing countries. This complements the recent thinking of Stiglitz *et al.* (2009) on internalising economic costs through more environmentally and socially inclusive reporting on economic performance. Although the Dutch government already uses the methodology in its annual environmental accounts, drawn up by Statistics Netherlands, these new indicators aim to allow better accounting for services and the effect of deforestation, pollution and degradation of water catchment areas, and soil depletion to be incorporated into policy making. This is in response to the failure of traditional indicators such as gross national product (GNP) to provide information about the sustainability of economic development.

3.4 Focus on multi-actor value chain governance

Looking at how the government frames specific roles and responsibilities for different actors and reflects on its own role in achieving its aspirations, the documents addressed in this discourse analysis show a dominant discourse on collaboration. This focus on collaboration is justified by the character of the issues to be addressed:

“Due to the global charter of the commodity issue the possibilities for national policy solutions are limited.” (Commodity Note)

“With a broad and complex topic like biodiversity (conservation, sustainable use and fair division) there are many actors involved, of which the government is only one. That’s why collaboration between the government, businesses, societal organisations and knowledge institutes is an absolute prerequisite to achieve the formulated goals.”

“Together we are responsible for the conservation and use of biodiversity on earth, without “working together” there is no “living together.” (Biodiversity Program 2008-2011)

The Biodiversity policy program 2008-2011 states:

“In the implementation of the policy program for sustainable economic chains the transition approach is central. This approach focuses on the long term objectives and process support of the selected value chains. Chains are multi-dimensional; they connect here and there, the local and international level and cannot be seen separately. Only by putting the issue of sustainability on the agenda from different perspectives and by working in a process manner the synergy can be achieved that leads to change. Making value chains more sustainable is pre-eminently a theme in which the government has to collaborate with societal actors: businesses, societal organisations and knowledge institutes.”

In respect of the sustainability of value chains, the government states:

“The cabinet sees its main task as primarily the facilitation of the desired societal transition. A transition that only takes shape if producers and consumers of natural resources make agreements about the careful treatment of our biodiversity and the reduction of the Dutch Footprint in foreign countries.”

These quotes show that the government's vision on tackling biodiversity and ecosystem degradation is to support collaboration between different actors and develop public private partnerships. Both in the commodity note as well as the Cabinet's response to the advice of the taskforce biodiversity and the Dutch agenda for sustainable growth, the government clearly pushes the business sector forward as the leading party:

“With the taskforce the government gives a central role to the business sector, of which a growing part is already to a large extent engaged in sustainability.” (Response letter to taskforce advice.)

"With the formulation of solution directions the cabinet has taken for granted that the business sector is primarily at play and that the government can facilitate, stimulate, set a framework and coordinate."(Commodity note)

This leading role for the private sector is not only justified by the nature of the issue at stake as described above, but is also legitimised with a second argument based on the Netherlands historical and current nature as a trading nation:

"The Netherlands is a trade country.... An open attitude to the world is crucial for the Dutch economy. Entrepreneurship stands for dynamics and adaptability. The things we need severely in a fast changing world. It is the entrepreneurs and citizens that that capitalise on opportunities. They deliver the biggest contribution to growth, wealth and employment. Entrepreneurs also focus increasingly on sustainable ways of production. Stimulating entrepreneurship is above all giving space and leaving responsibilities to entrepreneurs and citizens."

In its sustainability agenda, the Dutch government promotes green growth. Sustainable agricultural production is seen as essential for sustainable wealth in the future. In the vision of the Ministry of EA , partnership through 'bundling our forces' is presented as a way to increase growth:

"Only then we can develop and utilize knowledge with businesses and knowledge institutes optimally. It is about knowledge, skills and cashing."

The budget and accompanying vision of the Ministry of EA provide the most recent and concrete description of the role, responsibilities and tasks related to ecosystem services and sustainable value chains. Central to the vision of the ministry are four objectives:

1. To strongly position the Netherlands internationally: aim at the top.
2. To offer space for entrepreneurship and innovation.
3. To promote sustainable wealth, with eye for humans and nature.
4. To work towards a future-proof agricultural production and energy provision.

These four priority approaches together with the above mentioned quotes give a clear indication of the framework in which the agenda on ecosystem services has developed. In these discourses the benefit to the Dutch economy not only has become an aim of policy interventions, but also a criterion for the policy instruments on ecosystem services and sustainable value chains to be developed in the future.

In the vision of the Ministry of EA , the policy framework for ecosystem services is still under development. However in 2013 the Ministry aims to develop an indicator that reflects the economic significance of nature/biodiversity for society in terms of the share of ecosystem services incorporated into the Dutch GDP. Besides this, the Ministry wants to invest in the creation of markets for ecosystems services such as CO₂ storage, water storage, recreation and health, which are currently provided for 'free' for society. The government aims to do a feasibility study on opportunities for market mechanisms for ecosystem services in the Netherlands and an impact assessment to develop insight into the dependence of the Dutch top-sectors on natural resources, nature and biodiversity. To achieve its international objectives and agreements, the Ministry of EA commenced a new policy program called Natural Entrepreneurship '*Natuurlijk Ondernemen*'. The aim of this program is to stimulate investments in nature and biodiversity that also contribute to the enabling business environment and the Dutch competitive position. To achieve this, they want to create a level playing field for businesses working on sustainability in value chains. The response letter to the taskforce on biodiversity included:

"Corporate social responsibility is in first instance a responsibility for businesses themselves, but the government will have an active role in putting CSR on the agenda of businesses."

Other initiatives of the Dutch government on cross sector collaboration in sustainable value chains include:

- Green Deals between businesses and knowledge institutes. The government has set out to develop green deals, in which the government invites business and knowledge institutes to develop initiatives for the support of green growth, sustainable value chains and biodiversity particularly. The green deals are supported by the government by creating experimental space, support and give exposure to inspiring icon projects, removing unnecessary (legal) hindrances, where necessary propose stimulating legal instruments, for example to make the innovations and markets for ecosystems possible and knowledge development and dissemination.
- A multi stakeholder platform coordinated by IUCN and VNO/NCW on businesses, biodiversity and ecosystem services.
- Support for the network of the Sustainable Trade Initiative (Initiatief Duurzame Handel, IDH).
- The Dutch study on *The Economics of Ecosystems and Biodiversity* (TEEB)
- Support (from EL&I) for the Business meets Biodiversity conference.

In these initiatives, but also in the sustainability agenda and vision of the Ministry of EA , the strong focus on cross sector collaboration is again apparent, with a so called 'golden triangle' (government, businesses and knowledge institutes). Equally, the role that the government ascribes itself is focussed on giving business freedom and facilitating and supporting innovation and initiatives for sustainable value chains. The governments preferred role can be seen as one of partnering, facilitating and endorsing, rather than of mandating and regulating (Van Tulder, 2008). The objectives and evaluation of the initiated collaborations and public-private partnerships are not further described. The descriptions of the governments' vision on collaboration between different sectors indicate that future policy initiatives should benefit the competitive position of Dutch businesses and the growth of the Dutch economy.

3.5 Synthesis

Ecosystem services are positioned in Dutch policy as a global and as a European issue. This is done by referring to the Millennium Ecosystem Assessment and by describing ecosystem services in global and European objectives. The concept of ecosystem services is not explained in relation to biodiversity and it is not clear why certain policy objectives relate only to biodiversity and not to both biodiversity and ecosystem services. Ecosystem services are dominantly related to markets and payment mechanisms, while biodiversity is associated with maintenance and sustainable trade chains. The dominant causal interpretation arising from the policy documents, some with more explicit language than others, suggests that the main cause of ecosystem degradation is the lack of incorporation of the costs of biodiversity and ecosystem services into market prices. This contention has led to a focus on economic measures as the solution to conserve and maintain ecosystem services.

Sustainability challenges for business is framed as an opportunity to strengthen the Netherlands competitive position, particularly in more recent policy documents emerging after the 2008-2011 biodiversity program. A clear dominant discourse emerges regarding the distribution of responsibilities and the need for cross-sector collaboration and partnerships between government, industry, research and civil society, with the government taking a supporting and facilitating role. The government has thus invested in the development of multi stakeholder platforms, collaborations and in developing a policy agenda to further integrate economy and ecology, in which businesses take a leading role to develop innovations for sustainable value chains. The evaluations of these collaborations or partnerships are not further elaborated in the texts.

Thus Dutch policy discourse on sustainable value chains and ecosystem services can be summarized as a predominantly economic frame:

“Ecosystem services degraded because they are provided for free. The environmental costs are not incorporated into the price. In order to stop further degradation of biodiversity and ecosystem services these should be valued and priced. The government aims to develop markets and financing mechanisms for ecosystem services, to achieve this, the government gives the lead to the business sector to come up with innovations in the value chain, these innovations are facilitated, stimulated and supported by the government in collaboration with knowledge institutes(the golden triangle). The support that the government supplies will increase innovations in sustainable value chains in developing countries, which will create a better trading climate for the export of commodities to the Netherlands and will create a competitive advantage for Dutch companies in other countries.”

In this framework for the governance of sustainable value chains and ecosystem services, the following criteria for guiding current policies and future initiatives can be deduced:

1. The concept of ecosystem services is used to integrate economy and ecology with a dominant economic based or user based view of the value of nature/biodiversity.
2. A strong belief and underlying assumption in the ability of market mechanisms to integrate and secure ecosystem services in business and chains.
3. The sustainability agenda is internationally driven, which is strengthened by the Dutch government as it is in their interest to improve the Dutch competitive position and economy.
4. International objectives concerning biodiversity maintenance and ecosystem services will be met by maintaining an open trade economy and creating space for business actors to develop sustainability initiatives and innovation, with the business sector in the lead and a facilitating, stimulating and supporting government.
5. Biodiversity is valuable and by creating markets and payment mechanisms to conserve it, its conservation will contribute to poverty alleviation and development, as the majority of the world's poorest people depend to a large extent on natural resources.

It equally reflects a long term transition in Dutch policy (Elzen *et al.*, 2004). – not just in evolving environmental policy (Keijzers, 2000) but from neoclassical economics towards a greener macro-economy embracing energy, land use, trade and consumption. Positioning the policy discourse internationally, it follows trends in other Western, developed countries towards multi-actor governance of sustainable value chains (Vermeulen and Kok, 2012).

4 The tropical timber value chain

4.1 Introduction

This section applies the conceptual framework for value chains depicted in Chapter 2 and summarised in Figure 3 to the tropical timber value chain. First the natural resource base and ecosystem in which the chain originates (tropical forests), is briefly introduced (Section 4.2). Then the chain is described (Section 4.3), the types of actors involved and the process dynamics (Section 4.4) and finally framework conditions (Section 4.5). These set the wider scene in which the case studies (described in Chapter 5) are embedded.

4.2 Natural resource base

The ecosystems which produce tropical timber, shown in Figure 4 include tropical moist, primary forests, some of the most species-rich, diverse terrestrial ecosystems globally. Worldwide primary forests account for 36% of forest area but have decreased by more than 40 million hectares since 2000 (FAO, 2010). Timber is derived from different regimes with just over half (57%) of forests globally being natural primary forests⁸ which are naturally regenerated, but often show clearly visible indications of human activity (FAO, 2010). Timber is also derived from regenerated forests (where natural forests, often after logging, are enriched with native species) and forests planted on a large scale (plantations), with 7% of forests established through planting or seeding.

For tropical forests, the figures are much lower with the majority of timber extracted from primary or secondary natural forests. On a national level, particularly in Asia and in the Congo Basin, this type of data is unavailable, however in the Amazon Basin in Brazil, 1% of forest was planted in 2010 (FAO, 2010). Timber may also be sourced from small scale agroforestry and individual trees outside of forests. The main supply zones for tropical timber, as shown in Figure 5, are the Amazon Basin, the Congo Basin and Southeast Asia (particularly Indonesia, Malaysia, Myanmar, Thailand and Vietnam) (FAO, 2011). In 2010, 205 countries together accounted for 99.9 % of the total forest area of which close to 1.2 billion hectares or 30% is designated primarily to timber production (FAO, 2010).

Timber is a general term applied to forests and their products. Trees transformed into logs are one of the major products in the value chain, with the most common units of measure being round wood equivalents (RWE) and sawn lumber (i.e. planks). They also provide the raw material which supplies the pulp and paper sector. Wood chips from the sawing process and other parts of trees are used as biomass to supply energy production plants.

Figure 6 shows that the majority of exported tropical timber originates from the Amazon Basin, followed by the Congo Basin and Southeast Asia. In the Netherlands, 94% of timber and timber products consumed are imported⁹ (Schanz and Ottitsch, 2004). Of the timber and timber products imported to the Netherlands, the major proportion (63%) is non-tropical and comes from the EU. Reflecting general trade patterns, of the remaining 37%, one third is comprised of tropical timber originating from Malaysia, Indonesia and Brazil, one third is from China, Russia and Canada and one third from other non-EU countries (Kamphuis *et al.*, 2010). Since 1990, total imports of tropical timber have decreased from 1.5 million to 0.8 million m³ RWE and the proportion of round wood has decreased from 0.1 million m³ RWE to 0.8 million m³ RWE due to the economic crisis, with sawn wood continuing to form the largest proportion of imports at around 75% of total imports, and plywood forming 25% in 2009 (Kamphuis *et al.*, 2010).

⁸ Primary forests are forests of native species in which there are no clearly visible signs of past or present human activity.

⁹ Royal Dutch Association for Timber Enterprises (VvNH) <http://www.vvnh.nl/houtmarkt> retrieved 14 September 2012.

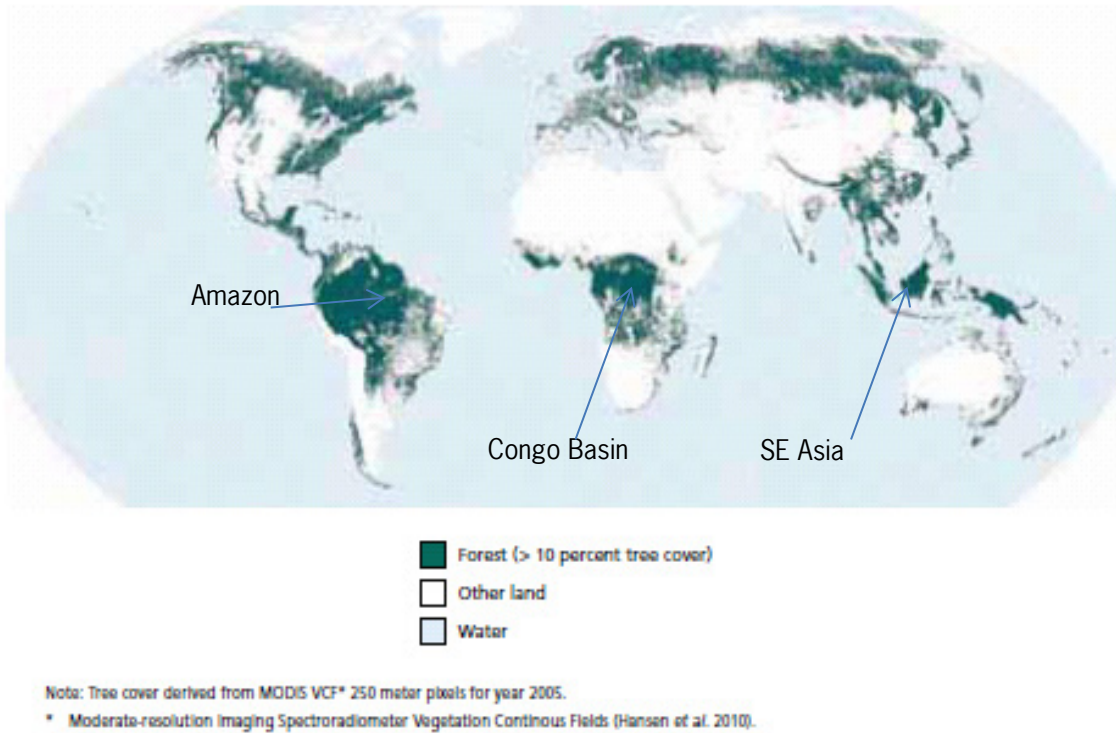


Figure 4 World forest cover showing tropical timber production regions. (Source: FAO, 2010)

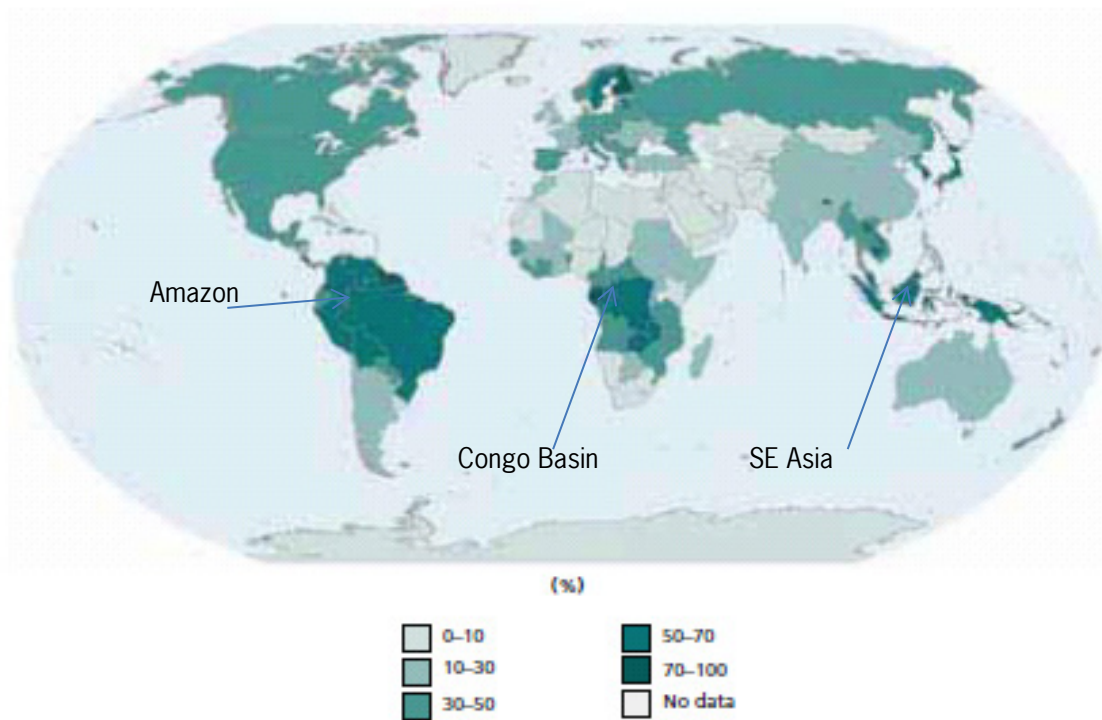


Figure 5 Forest area as percentage of total land area by country 2010. (Source: FAO, 2010)

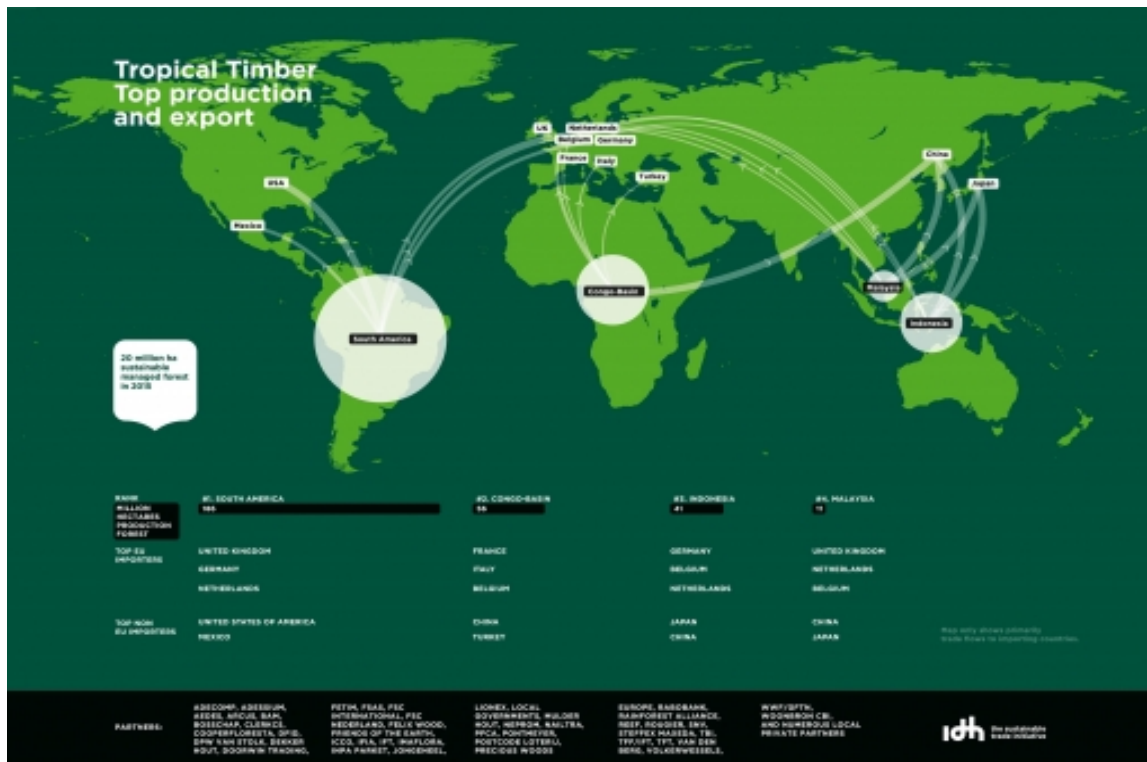


Figure 6 Tropical timber main production areas and exports (Source: IDH)

The Netherlands is an important entry point for tropical timber to the EU, its importance increasing since 2000. Between 2007 and 2009 30% of total timber exported from Malaysia to the EU came through the Netherlands while figures for Indonesian timber and Brazilian timber were 21% and 9% respectively (Kamphuis *et al.*, 2010). The Netherlands is one of the largest consumers of tropical sawn timber in the EU, consuming 262 thousand m³ in 2010. It accounts for about 20% of EU16 consumption, making it the 2nd largest EU consumer, above France (20%) and below Italy (23%). Between 2005 and 2010, consumption of tropical sawn timber decreased by an average of 7.1% per year (CBI 2011). The economic crisis, that began in mid-2008 and the plummeting construction sector that occurred as a result sharply reversed the growing value of imports. Imports from the three major importers decreased from a peak in 2005-2006 of USD 500 million to USD 292 million in 2009 (134 million USD from Indonesia, USD 100 million from Malaysia and USD 58 million from Brazil) (Kamphuis *et al.*, 2010). Sawn timber imports have been dropping since 2006 but the decrease was most significant in 2009 (32%). In 2010, consumption slowly starting growing again (4.4%). In comparison, EU consumption dropped by an average of 14% per year between 2005 and 2010 (CBI, 2011). Despite the downturn, the economic importance of the chain is highlighted by the figures provided by IDH (source unknown) which indicate that the timber sector has an annual turnover of € 438 million in the Netherlands and provides 8.000 direct FTEs.

These tropical forests are also some of the most bio diverse places on earth (Olson *et al.* 2001; FAO, 2010). Biodiversity values are substantially lower in degraded than primary forests, although this varies considerably by geographic region, taxonomic group, ecological metric and disturbance type. Most forms of forest degradation have an overwhelmingly detrimental effect on tropical biodiversity. Gibson *et al.*, (2011) indicate that when it comes to maintaining tropical biodiversity, there is no substitute for primary forests. However, despite the recognition of the importance of tropical forests as providers and havens of ecosystem services and biodiversity, increasing rates of losses have been noted (Butchart *et al.*, 2010). This is mainly due to land-use changes, which is expected to continue and have a more significant impact than climatic changes (Sala *et al.*, 2000) or PES (Guariguata, 2009).

4.3 The tropical timber value chain

The tropical timber chain has a long history and is summarized diagrammatically in Figure 7. The chain is complex, originating from many geographic areas and from different ecosystem types. These are separated into six main product channels, each with different consumers and actors. In the Netherlands, the sector's reliance on mainly imported (non-tropical and tropical) timber means that Dutch activities in the chain are concentrated on processing. The majority of timber comes from members of the Dutch Timber Trade Association (VVDH) with a small number of companies operating timber concessions in the tropics. Given that there is no tradition of artisanal or timber manufacturing in the Netherlands, the majority of timber processing tends to be bulk-production. Historically much of the production was used by the mining industry, nowadays the most important buyers come from the pulp and paper sectors (Schanz and Ottitsch, 2004). The timber trade is characterized by a multitude of relatively small companies, explained by the low economic importance for Dutch processing industries and low national timber production (Schanz and Ottitsch, 2004; Probos, 2012; Oldenburger *et al.*, 2010).

There is a low level of vertical integration – the extent to which a company is involved in or controls steps along the chain from the forest to end product to increase the company's power in the market – however this is increasing. A number of Dutch companies for example are active along several segments of the chain with Transformation Reef (Cameroon and Brazil), Koninklijke Houthandel G. Wijma en Zonen B.V. (Cameroon), Form International (Ghana) and Koninklijke Jongeneel B.V. (Malaysia) operating plantations and concessions in the tropics as well as processing, export/import and processing and wholesale facilities in the Netherlands.

In the Netherlands in 2011 en 2012 77% of the timber that VVDH members imported was sustainable, coming from sustainably managed forests carrying the FSC or PEFC label. Although a distinction is not made in VVDH figures, the amount of certified hardwood imported by VVDH members (as a proportion of total hardwood imports) rose from 31% to 36% (in m³) compared to an increase from 88% to 90% for softwood (Probos, 2012).

The volume of certified timber products on the Dutch market in 2008 was 2,180,000 m³ RHE. This is 33.8% of the total quantity of sawn timber and panels consumed in the country; 92% of the volume of certified timber on the Dutch market meets the purchasing criteria of the Dutch government. Besides the volume of certified timber there were 866,000 m³ RHE of sustainably produced sawn timber and board material without a license in the Dutch market in 2008. This corresponds to a market share of 13.4% of total timber consumption. The amount of demonstrably legal sawn tropical timber on the Dutch market in 2008 was 260,000 m³ RHE. That is 35.5% of the total amount of sawn hardwood in the Netherlands; 84% of this volume meets the purchasing criteria of the Dutch government (Oldenburger *et al.*, 2010).

Around 94%¹⁰ of timber used in the Netherlands is imported, mainly via wholesalers (largely VVDH members), with 93 VVDH members listed in 2011 as importing or buying tropical timber, which is then transformed from logs into sawing, and then into different sectors, such as timber, furniture, construction and retail where it may be further processed into an end product. The construction, housing, utility and infrastructure sectors are the major routes. The main proportion of tropical (hardwood) enters from foreign sawmills, producers and shippers to wholesalers, from where it is sold to the furniture, building construction (renovations and new), construction materials and others (e.g. ships) sectors.

¹⁰ <http://www.vvdh.nl/houtmarkt>

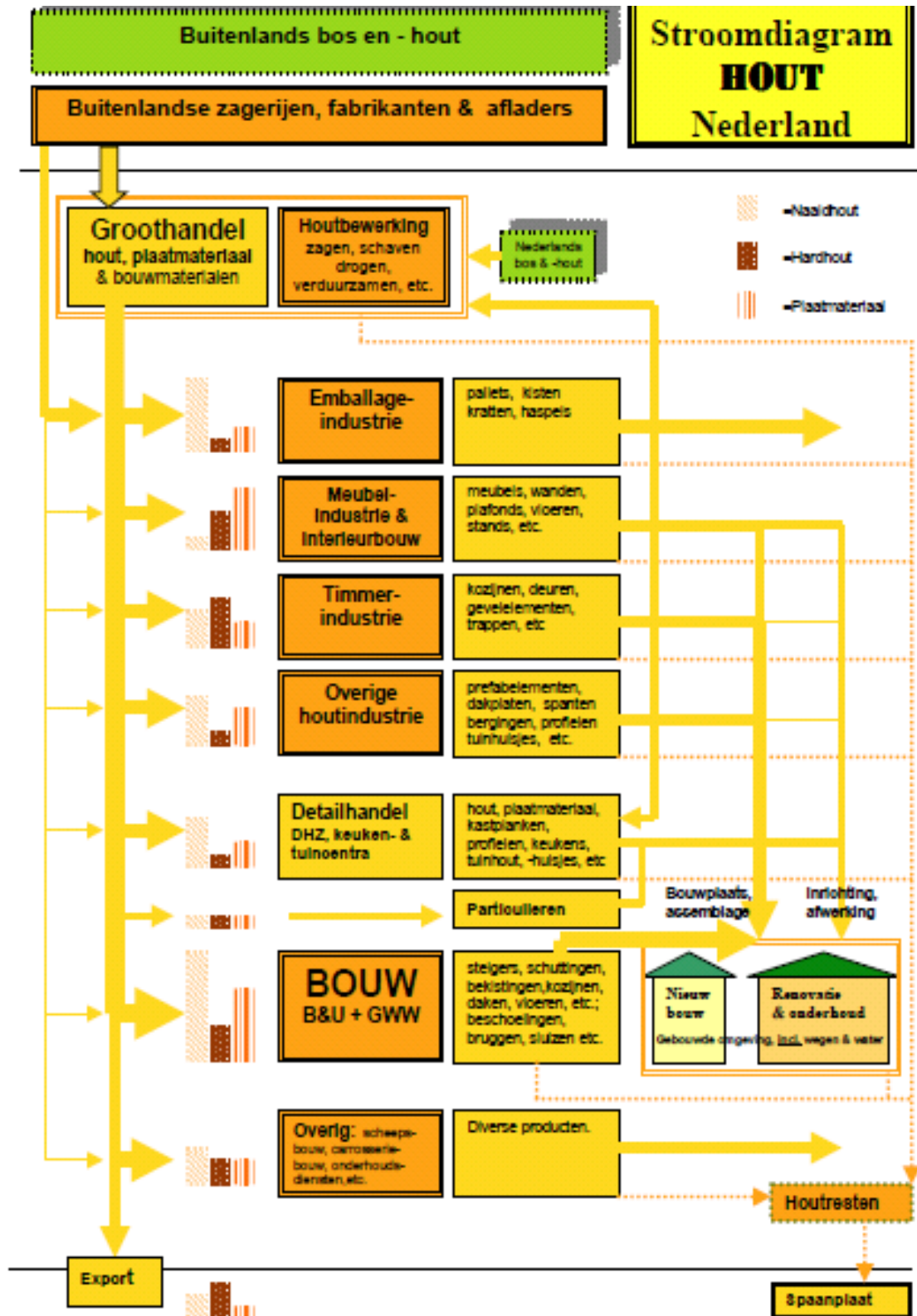


Figure 7 Timber value chain in the Netherlands (Source VVNH)

Over the last two decades a number of trends in the timber value chain have developed. Deforestation, mainly due to the conversion of forests to agricultural land, is decreasing in several countries but continues at an alarmingly high rate in others. Most of the net loss of forest continues to occur in countries in tropical regions while most of the net gain takes place in the temperate and boreal zone and in emerging economies such as India and Vietnam. There is also an increasing area of forest being designated for conservation of biological diversity. 12% of global forests are currently protected with major increases occurring between 2000 and 2005.

4.4 Process dynamics in tropical timber chains

This section analyses the dynamics of processes in the tropical timber value chain by examining the actors involved in the chain and their relationships, the institutions governing the chain and the processes used to do this.

Relationships between value chain actors and the main groups are shown in the rectangles in Figure 7. As well as these direct actors, a host of indirect actors are also involved in influencing, governing or lobbying for changes at various stages of the chain. These include national governments, bilateral organizations (DFID, GIZ, SIDA, JICA etc.), multilateral organizations (FAO, UNFCC, UNEP), conventions and their agencies (CBD, CITES), some 23 institutes and associations¹¹, national and international industry associations (ITTO, European Timber Trade Federation (ETTF), VVNH and 16 sector trade associations¹²), networks and platforms of tropical producers (i.e. community forest network in Asia RECOFA), around 40 nature protection, conservation and human rights organizations¹³ (Conservation International, Greenpeace, Friends of the Earth, Milieudefensie, Rainforest, WWF etc.), certifying organizations (such as Forest Stewardship Council (FSC), Program for the Endorsement of Forest Certification (PEFC), Malaysian Timber Certification Council (MTCC), Sustainable Forestry Initiative (STI)), independent auditors and national and international research organizations (Universities, CIFOR, Tropenbos International, WRI, ICRAF etc.) and network organisations such as the Association for Tropical Forests.

Business trends over the last two decades include timber companies moving from offering policy statements to offering compliance and verification procedures, a move away from spot markets to longer-term supply contracts, a move from country-based to supplier-based risk assessment, development of progressive coalitions along the value chain and the development of progressive coalitions with actors in other countries. Relationships between chain actors can be characterized according to the five aspects: (1) Degree of strategic alignment, (2) Trust, cooperation and commitment, (3) Power and dependence, (4) Extent of opportunism and (5) Conflict and its resolution.

¹¹ See

http://www.tropischebossen.nl/index.php?option=com_bookmarks&Itemid=44&mode=0&catid=2&navstart=0&search=*

¹² Vereniging Parketvloeren Leveranciers (VPL), Nederlands Verbond Toelevering Bouw NVTB, NVB Vereniging voor ontwikkelaars & bouwondernemers, Koninklijke HEB, Nederlandse Emballage- en Palletindustrie Vereniging (EPV), Centrale Bond van Meubelfabrikanten, Nederlandse Vereniging van Houtagenten, Vereniging van Houtconstructeurs, CNV Hout en Bouw, FNV Bouw, Algemene Vereniging Inlands Hout (AVIH), Verduurzaamd Hout Nederland (VHN), Vereniging van Houtskeletbouwers (VHSB), Nederlandse Bond van Timmerfabrikanten, Vereniging van Nederlandse Houtondernemingen, Nederlandse Vereniging van Houtagenten (NATA).

¹³ The Dutch Association for Tropical Forests (VTB) lists 44 NGOs, See:

http://www.tropischebossen.nl/index.php?option=com_bookmarks&Itemid=44&mode=0&catid=2&navstart=0&search=*

Degree of strategic alignment

In domestic, European forest chains, clustering has been used as a mean of increasing strategic alignment (Rimmler *et al.*, 2011). Such alignment has not been specifically noted for the tropical timber chains connected to the Netherlands however strategic alignment has been enhanced at the start of the chain by new designs, hi-tech production methods and process and product innovations, most notably in Indonesia (Purnomo *et al.*, 2009; Teischinger, 2009). There have however been changes in the way that actors in the chain are connected. Certification and community and small scale forestry networks are one example, having emerged in the last decade to bring innovations and new actors (local communities and small forest-based enterprise) into resource management and small-scale processing (Gellert, 2003; Colchester and Ros-Tonen, 2006).

Trust, cooperation and commitment

Forest certification and FLEGT have created new production to consumption relationships that span the chain and connect actors previously separated by the fragmented and geographically dispersed nature of the chain. While highly context specific, certification has in some cases created trust and legitimacy for actors in the (sustainable and legal) origins of timber for buyers and consumers (Meidinger, 2003) while in others it has created distrust (McDermott, 2011). Certification and Voluntary Partnership Agreements (VPAs) have added to political and trade barriers, and technical practices purportedly designed to codify timber and fibre quality by setting standards often raise costs for forest management and traceability (Stringer, 2006).

Forest certification has not only created new relationships and cooperation along chain actors, it has also, by adding value to certified timber, created competition between those certified and not and amongst different certification standards. Trust has developed as VPA negotiations take place, and together with consistent interactions have helped to break down barriers that were once commonplace between various forest sector actors (Othman *et al.*, 2012). There remains however a notable absence of trust and cooperation between groups of certain NGOs supporting certification as sustainable and those believing it undermines forest conservation (Dauvergne and Lister, 2011).

Power and dependence

With increasing demand, the power of major timber exporting nations and the timber companies has increased, enhanced by political strategies and negotiations which influence global timber chains. Gellert's (2003) study of how an oligopoly of timber-producing firms in Indonesia came to dominate the production and export of processed tropical plywood from 1985 to 1998 highlights that the small group of producers gained power by forging alliances with the state to gain control over timber producers and negotiated an external alliance with Japanese importers to penetrate that core market. Political influence of timber companies and producing states is thus an important aspect of their power (Gellert, 2003).

Experiences from Peru (Putzel, 2009) indicate that the tropical timber chain is strongly influenced by the politics of international institutions and bilateral trade arrangements with the objective to regulate timber trade and protect forests. However in Peru, the reforms these organizations promoted did not adequately govern the logging industry. This allowed Chinese timber supply chains operating in the Amazonian region to gain control, as corporations adapted to new trade norms, resulting in China signing a bilateral free trade agreement with Peru. Similar experiences have occurred in the Congo Basin (Topa *et al.*, 2009). The recent European Commission negotiations to ensure legal timber imports to the European Union have used bilateral agreements in recognition of this power and the differing institutional and economic context found in the major tropical timber exporting nations. This allows for the context in each country to be taken into account.

Extent of opportunism

Certification has been seen as one of the most significant responses to changing consumer requirements and pressure from the conservation lobby (Bass, 2001). As Tim Synnott, FSC's first Executive Director noted: "It looked as though forestry certification was an opportunity to mobilize

market forces in support of good forest practices, forces far more powerful and penetrating than any of the typical technical collaboration projects, institutional strengthening, training programs or policy reforms” (Synnott, 2005). The increasing globalization of the timber sector has also provided a window of opportunity for companies in the chain, producers operating in these forests and retailers selling their products to differentiate their products (Bass, 2001). When market exchange happens on a small scale, actors’ knowledge and mutual monitoring can limit opportunism and allow markets to function. But when trade is complex and geographically dispersed, mechanisms for supplying credible information and judging others’ integrity are more difficult unless systematized and rationalized (Bartley, 2007). Conservation organizations have also opportunistically grasped different models of conservation: one model is to prevent logging by showing its unsustainability and illegality (Greenpeace International, 2003; Greenpeace International, 2007), another is to promote certification, such as WWF (Bass, 2001), and yet another is to promote the commodification of non-timber forest products as a way to increase the value of forests beyond timber (Dove, 1994; Sarshar, 2004).

Conflict and its resolution

Within the tropical timber chain a number of conflict nexuses exist. One concerns the allocation of forests for logging amongst the timber industry, another is due to the fact that governments are seeking revenue from natural resources and another is that organisations (such as nature conservation and human rights NGOs and lobby groups) are seeking to conserve and protect forests for their biodiversity, their ecosystem services, their use by local populations and their role in poverty reduction (Veuthey and Gerber, 2009). Responses have been changed to include management techniques that promote reduced and low impact logging. Certification has also been one of the responses to resolving such conflicts, by taking into account areas of high conservation value (Domask, 2003; United Nations Development Programme, United Nations Environment Programme *et al.* 2005). Certification however has also raised several conflict areas of its own. In the mid-1990s when certification started “the whole idea was a battleground” (FSC, 2011). It continues to stir controversy, with several NGOs criticising schemes such as FSC and PEFC, and even a dedicated independent observer, FSC Watch.

Conflicts have also arisen around the rights of local, forest-based populations to access and exploit timber (Hess 2004; Larson *et al.*, 2008). Mechanisms to address this at a national level have focused on the reform of land tenure and forestry regulations and rights-based approaches which focus primarily on (NGOs, activists and donors) helping communities to identify and defend their rights to land and resources. New ownership and management regimes have emerged, such as community forests. Conflicts have also occurred between governments, forest users and timber concessions holders concerning disagreements the right of local populations to access and exploit timber and non-timber products in forests allocated for timber (Guariguata *et al.*, 2010). These have been addressed by new regimes for forest management, including certification which takes into account local livelihoods and competing claims. Companies have favoured using stakeholder management and engagement systems as part of their overall management to take into account and deal with competing claims by other forest users. Another conflict has focused on illegally felled timber and ‘blood’ timber originating from corrupt regimes (Price *et al.*, 2007; Wirkus and Schure 2008). The FLEGT process and VPAs have been one of the methods of resolving this conflict.

Following Kaplinsky and Morris (2000), the mechanisms of governance and coordination in value chains indicate who controls which aspects of the chain. These can be assessed by examining:

1. *Legislative governance*: concerns setting product standards and transaction conditions. In the tropical timber chain, technical standards for timber are well defined. These worldwide standards concern moisture content, strength, durability, stress grade, fire hazard properties, standard sizes, preservative treatment etc., and are used as quality and safety specifications to meet regulatory standards for construction and materials use. There are also national regulatory standards concerning the origin and legality of timber, such as the EU FLEGT, the Timber Trade Action Plan and the US Lacey Act. Signatories to Convention on International Trade in Endangered

Species of Wild Flora and Fauna (CITES) are obliged to implement the convention nationally to ensure the control and monitoring of the trade of listed endangered species, such as tropical timbers big leaf mahogany (*Swietenia macrophylla*) and ramin (*Gonystylus* spp.).

2. *Judicial governance*: concerns monitoring the performance of suppliers in meeting these product and transaction conditions. There are regulatory frameworks for monitoring and controlling timber, at various points in the chain, such as import and sales points. A number of European countries, including the Netherlands, have also introduced public procurement policies, requiring a percentage of their timber supply to be sustainably sourced
3. *Executive governance*: concerns the implementing support systems which assist suppliers to meet product and transaction conditions, and set incentives and sanctions to reward or punish performance. Certification schemes are good examples of executive governance, with consultants, trade associations, and auditors providing the support systems the certification scheme requirements. Incentives take the form of consumer acceptance, higher sales and prices and government support or obligations for the purchase of sustainable timber. Market-led sanctions include “name and shame” campaigns against companies and practices which either do not comply with certification or are claimed to be unsustainable, criminal or unethical¹⁴.

How these aspects of innovations in chain governance are organized, and the role played by the different chain actors varies depends on the geographical location and specific clusters of actors. However, some generalisations have been made. Klooster (2005) provides evidence that NGOs have influenced the social and environmental aspects of tropical timber production through certification. As certification schemes become mainstream however, they are often compromised by the interests of more powerful agents, such as retailers. Whilst their engagement was essential to expand the coverage of forest certification, it has limited the spread of forest certification among medium-sized, small, and community forest management operations. This raises questions of fairness as costs are imposed without providing compensation through higher prices. This has led to NGOs supporting programs to make FSC certification more accessible to these actors, but which do not resolve the cause of power imbalances between major retailers requiring certification and small-scale operators. This trade-off has been seen to limit the reach of certification and compromise their equity.

Brown and colleagues (2002) signal the trend by bilateral, international financing agencies and donors to use tropical forestry as entry points for governance programs. The very factors which make it a challenging sector for development assistance commend it as a hotbed for governance reform: its inclusive focus; its global to local chains; its high value and benefit; its local fiscal base; its tenure and collective rights issues; and its importance to rural livelihoods. Such ideologies led to the birth of new governance arrangements such as decentralisation initiatives (community, council and local forestry), certification in which small-scale forest owners, communities, civil society organizations and market actors play a greater role (Weiland and Dedeurwaerdere, 2010). These experiments and efforts have produced mixed results (Tucker, 2010).

Learning processes

Each new set of governance innovations that has swept through the forestry sector, particularly those that have ripple down effects, such as illegal logging initiatives, FLEGT and certification, have created a flurry of potential learning-related activities. The results of these academic articles, media interest, comments by spectators and stakeholders, protests, meetings, websites, social media actions, conferences and workshops has been a reflection on the impacts, opportunities and challenges to stimulate learning and improvement; sometimes directly (for example the Chatham House meetings, the illegal logging website¹⁵ and articles (Tacconi *et al.*, 2004; Overdeest and Rickenbach, 2006) and sometimes indirectly through conflicts (Meidinger, 2003; McDermott, 2011).

¹⁴ See for example

http://www.forestsmonitor.org/uploads/2e90368e95c9fb4f82d3d562fea6ed8d/fact_file_Wijma_1_.pdf and
<http://forests.org/shared/reader/welcome.aspx?linkid=9846&keybold=biodiversity%20ancient%20rainforest>.

¹⁵ http://www.illegal-logging.info/item_single.php?it_id=479&it=presentation

4.5 Framework conditions

This section briefly covers the contexts in which the tropical timber value chain operates and is embedded. Sustainability in the forest sector is affected by external and internal forces (FAO, 2011: 30) as well as by policy, regulation, and institutional factors (FAO, 2010: 149), termed framework conditions. These conditions are listed in Table 5.

Table 5 Framework conditions

1.	Demographics in low and middle-income countries
2.	Economic growth
3.	Globalization
4.	Social trends
5.	Demographics in high-income countries
6.	Competing materials
7.	Competition of resources
8.	Changes in forest ownership, control and management
9.	Regulatory
10.	Institutional framework
11.	Business operating environment
12.	Transport infrastructure

Whether these conditions have a positive or negative influence varies between countries and between sectors. Globalization for example, can be viewed as a positive force in some places but as a threat (negative influence) in others (FAO, 2011: 31). Population demographics and economic growth are the fundamental forces affecting the forest industry. These have a major impact on the demand of forest products. They may as a result influence supply side industry development. Financial and economic developments influence the market for timber and timber products. The current economic crisis for example has caused the trade in timber and timber products to decrease, with (Kamphuis *et al.*, 2011: 93) imports of tropical timber by the Netherlands also decreasing (Kamphuis *et al.*, 2011: 97). Globalization has resulted in a rapid expansion in the international flow of capital, goods and services since 1990 and this is only expected to continue in the future. It has however led to some market homogenization, with the expansion of multinational corporations a prime example. Many products and services are now delivered to consumers in a similar way across the world and consumers are now aware of trends, tastes and fashions in other parts of the world (FAO, 2011: 32). Changes in social trends, such as public opinion, attitudes and lifestyle also occur when incomes rise.

Global demand for both timber and land has led to the destruction of tropical forest resources as well as the economic decline of the timber industry (Kamphuis *et al.*, 2011: 112). An increasing world population combined with increasing incomes causes' worldwide demand for timber to increase (Kamphuis *et al.*, 2011: 91). In markets such as packaging, personal care products, construction and furniture, forest products compete with other goods and services (FAO, 2011: 33). Similarly, when populations and economies expand, competition for resources (land, labour and capital) increases. Changes in forest ownership, control and management are occurring because of increasing attention to forest ownership and management rights of forests (by local communities) and to the fiscal measures governments use to support forest management and collect revenues from the sector. These trends are related to the changing roles of government and citizens in the sector (FAO, 2010: 119). In some situations privately owned forest can benefit from sustainable forest management, by assigning management responsibility and control to individuals or communities. In other cases, it may mean that forest property rights are transferred from the state and concentrated in the hands of relatively few individuals (FAO, 2010: 169).

Regulatory

Formal policies can provide strategic guidance towards sustainable forest management (FAO, 2010: 154) and consist of national and/or subnational forest, nature protection/biodiversity and trade laws, policies, programs and binding and non-binding international conventions and agreements related to forests and their management. Examples include the Convention on Biological Diversity, UN Framework Convention on Climate Change, Convention on International Trade in Endangered Species of Wild Fauna and Flora and the International Tropical Timber Agreement. The EU Action plan (Voluntary Partnership Agreement) restricts the amount of illegal timber entering the European Union and promotes the sustainability of timber sourced from tropical regions (Kamphuis *et al.*, 2011: 91). Their success depends upon the extent to which a country has ratified and adopted the agreement, as well as on enforcement and monitoring.

Regulatory frameworks include the rules and systems put in place to encourage best practice and compliance with the official rules (Gregersen and Contreras 2010). Frameworks are often outdated, with forest regulations designed decades, or in some cases, centuries ago. Fortunately, there are examples of redesigned and successful regulatory approaches that are combined with incentives. Policies relating to forests include sustainable forest management policies that limit the amount of produced timber and export timber from Malaysia and Indonesia to the EU (Kamphuis *et al.*, 2011: 91), illegal logging policies to combat illegal logging in major importing countries (e.g. FLEGT in the EU and the Lacey Act Amendment in the US), that increase the implications for producers and traders of timber and timber products (Kamphuis *et al.*, 2011) and the implementation of Reducing Emissions from Deforestation and Forest Degradation (REDD).

Institutional framework

This refers to the institutional structure and capacity, important for achieving national goals for forest management. Capacity is dependent on education and research while the institutional structure is related to forests and forestry. Examples include such things as:

- Who is responsible for forest policy formulation?
- The level of subordination to the minister i.e. the head of the forestry agency reports directly or indirectly to the minister.
- The level of human resources within public forestry institutions (this is an indicator of the institutional capacity to promote forest objectives).
- The number of graduates in forest-related education.
- The number of professional staff (people with an university degree) in publicly funded forest research centres.

The assumption is that a certain level of staff in public forest institutions is needed to promote sustainable forest management. But the overall needed institutional capacity depends on many factors such as financial resources, knowledge, technology, infrastructure and equipment, partnerships and overall institutional context (e.g. policies, legal framework and other institutions). Also the appropriateness of staffing levels also depends on society's demands on forests which, in turn, are driven by demographic, geographic, environmental and climatic factors, as well as the level of economic development and national priorities (FAO, 2010: 154).

The managerial, technical and administrative capacity of a country for sustainable forest management is dependent on education and research (FAO, 2010: 158) because education and research provide necessary and relevant information and knowledge to manage, conserve and enhance forest resources (FAO, 2010: 162). That can be indicated by:

- The number of students completing a master's degree is one indicator of the future national ability to develop and implement policies and strategies for sustainable forest management.
- The number of bachelor's degrees can provide an indicator of the ability to manage programs and implement policies.
- The technical certificates or diplomas indicate the ability to implement operational plans.

- The total number of university students who graduate with master's and bachelor's degrees may also indicate the importance society accords to forests and their management.
- The number of professionals working in publicly funded forest research is an indication of the national interest in, and capacity to solve, forestry sector issues.
- The percentage of female students points to possible future changes in the gender balance in forestry.

Besides institutional structure and capacity also customary or informal rules about forest ownership and use are of influence on how local communities maintain (or not) ecosystem services in relation to timber concessions. Especially in tropical forested areas customary control and governance of forests is often as (if not more important) than formal regulation and policies (Cotula *et al.*, 2007; Marfo, 2010). See also Guariguata (2009).

Business operating environment

Business operating environment is the context in which a chain operates commercially and can have impact on how chain operates e.g. corruption. References to studies such as World Banks doing Business reports (World Bank, 2010) and transparency international's corruption perception reports (Transparency International, 2011) and governance indexes (World Bank, 2010) highlight that countries with weak and fragile governments, poor governance, high levels of corruption and difficult business operating environments (such as many of the major timber producing countries from which Netherlands imports i.e. Indonesia, Malaysia, Russia) make conditions in chains more difficult, add costs and time... can speculate that may also be a (negative) link with attention to ecosystem services...certainly the link between illegal logging and negative impacts on ecosystems has been made (Koyunen, 2009; Alemagi and Kozak, 2010; DFID, 2010).

Transport infrastructure

Transport infrastructure such as roads, railways, rivers facilitate access to forest resources e.g. in remote tropical forests in developing countries, often difficult terrain and low levels of infrastructure (levels are mentioned in Doing Business report) which makes accessing timber often costly and difficult. The impact of increasing access to concessions (Ebeling and Yasué, 2009) (combined with other factors mentioned, such as agricultural expansion and population and urban growth) can be to reduce biodiversity and pressure ecosystems (e.g. increase in hunting, fishing, illegal timber felling, opens up routes for expansion of population and conversion of forest to farms (DeFries *et al.*, 2010; Gibbs *et al.*, 2010).

Internal forces

Besides external forces also internal forces affect sustainability in the forest industry. Internal forces are forces that appear throughout the production chain (from the fibre supply to end product). Many of these forces are related to the way in which the industry operates (FAO, 2011: 36).

Potentially positive internal forces are:

- environmental attributes of forest products;
- adaptability and management of the raw material supply;
- potential for innovation. The capability of innovation can be seen by the advances the industry makes in harvesting and logistics, processing technologies and the progress in extracting more products from each unit of fibre input. The focus here is on product and process innovation as such, but social innovation can also be considered here.

And potentially negative internal forces are:

- existing industry structure and investment;
- labour costs and working conditions;
- social and environmental performance and perceptions;
- maturity of existing product markets;
- end use issues (durability, regulations etc.).

5 Tropical timber value chain innovation cases

5.1 Introduction

This chapter presents the results of an in-depth analysis of four cases of innovation in the tropical timber value chain (see Section 1.3 for the selection criteria). The four cases are:

1. Forest Stewardship Council (FSC) certification.
2. Initiative for Sustainable Trade (IDH) and the Sustainable Trade Action Plan (STAP).
3. Dutch public procurement policy for timber products.
4. Reducing Emissions from Deforestation and Forest Degradation (REDD+ in Indonesia).

Using a retrospective approach, based on a literature review, interviews with key stakeholders and analysis of the content of conferences and seminars, the case studies aimed to answer the following sub-questions:

1. What is the innovation relating to ecosystems services in the tropical timber value chain, where did it take place in the chain, how, why and when (changes over time)?
2. What are the triggers and drivers, the opportunities and barriers behind the innovation?
3. Who are the stakeholders having taken part in the innovation process, and what are their relationships, in terms of knowledge, power, function and network (rules of the game)?
4. How did learning occur between the stakeholders and what impact/outcomes occurred due to learning?

In each of the four case descriptions, an introduction of the case is followed by a discussion of these questions and the impacts of the innovation and a conclusion.

5.2 Forest Stewardship Council certification

5.2.1 Background

The Forest Stewardship Council (FSC) is an international not-for-profit, multi-stakeholder organisation established in 1993 dedicated to the promotion of responsible forest management worldwide. FSC Netherlands is one of the 53 national FSC offices and a member of FSC International, itself a member based organisation. FSC certification enables businesses and consumers to make informed choices to select and purchase socially and environmentally responsible forest products. It aims to create positive change by engaging the power of market dynamics. Standard setting, independent certification and labelling of forest products are the main tools used to achieve these aims (see Figure 8). Products carrying the FSC label are independently certified to assure consumers that they come from forests managed to meet the social, economic and ecological needs of present and future generations according to FSC principles and standards (see Annex 3).

FSC currently offers four main types of certificates:

1. *Forest Management certification* for forest managers or owners whose management practices meet the requirements of the FSC principles and criteria.
2. *Chain of Custody certification* for to manufacturers, processors and traders of FSC certified forest products – which verifies FSC certified material and products along the production chain.
3. *Controlled Timber certification*, which allows organizations to avoid the categories of timber considered unacceptable (FSC Controlled Wood can only be mixed with FSC certified timber in labelled FSC Mix products).
4. Special *options* for small, low intensity and community forest operations.

Certification can be a tool for tackling illegal logging, as most timber certification schemes are based on sustainability criteria, and legality is taken to be inherent within sustainability. Certified timber is an easy way for consumers to demand or identify products made from legal timber. For this reason certification plays an important role in public procurement by national governments (See Section 5.4 for Dutch public procurement policy), allowing buyers of timber in the public sector to more easily purchase timber that meets the standard required by government. As of 3 March 2013, the EU Timber Regulation will prohibit the first placing of illegally-produced timber products on the EU market. Voluntary Partnership Agreements (VPAs) aim at ensuring legal compliance of timber exports to the EU. VPAs work as follows: the legal source and production of timber is verified by the partner country, which will award a FLEGT license to each consignment that is verified as legal. By purchasing FLEGT licensed timber, EU operators will be able to meet the obligations set by the EU Timber Regulation. FSC may be approved as a way to also prove legality. The EU regulation against illegal logging forces EU buyers to move down the supply chain to increase control of (environmental friendly or legal) supply. The VPAs provide a potential policy framework for Ecosystem services certification that is country and context specific.

FSC is not unique among forest certification schemes in addressing ecosystem services, but compared to PEFC, ecosystem services are much more explicit in its principles and criteria, notably in the preamble and principle 6 (shown in Annex 3), using either the same terms or similar as used in the MEA and TEEB. In comparison PEFC is much less explicit about ecosystem services. The mission, core values, criteria and 2007 strategic plan of PEFC make only implicit and very general reference to the term ecosystem services, stating that obtaining PEFC Sustainable Forest Management certification demonstrates that management practices meet requirements for best practice in sustainable forest management, including maintaining or enhancing the biodiversity of forest ecosystems and ensuring the range of ecosystem services that forests provide is sustained¹⁶. The proliferation of certification schemes with different requirements means that, as some certification schemes work well in some countries but not in others, certification is confusing for consumers and regulators, affecting the credibility of schemes and certification in general. Several schemes have been criticized for the lack of inclusion of social principles, such as effects on indigenous peoples, and system abuses, particularly in countries with forest governance and corruption issues (Greenpeace International 2003; IIED 2007).

The FSC-led project addressing ecosystem services called “Expanding FSC certification to Ecosystem Services” (ForCES) involves an innovative multi-partner¹⁷ pilot with US\$6, 77 million invested. It looks at what changes to the FSC system are needed over a four year period from 2012 to 2015. This aims to make FSC into a global leader in the certification of ecosystem services and is seen as a path-breaking way to expand FSC’s scope and relevance. ForCES helps further develop and test the applicability and market potential of FSC certification for ecosystem services. It explicitly recognises the importance of addressing ecosystem services, because much of the (socioeconomic) value of the services exceeds that of goods (such as timber). This untapped value in various tropical forests, even given on-going debates about how to value it, varies per hectare from \$60 for fuel wood, \$50 for pollination and \$1000 for water supply to up to \$2,200 for climate regulation (TEEB 2010). This provides an opportunity to go further than the current inclusion of ecosystem services in FSC timber and non-timber product certification, expanding to other forest products and services.

The project partners are researching, analysing and field testing innovative ways of how to evaluate and reward the provision of critical ecosystem services, such as biodiversity conservation, watershed protection and carbon storage/sequestration. SNV for example, is looking to link in the project’s activities with existing work in REDD+ and the national Payments for Ecosystem Services (PES) market. Pilot tests are being carried out at ten forest sites in four countries under different socio-political and environmental conditions. They aim to put in place ecosystem services

¹⁶ <http://www.pefc.org/certification-services/forest>

¹⁷ UN GEF, CIFOR and national partners SNV (an MSF supported organisation, implementing Dutch policy) Vietnam, WWF Indonesia, FSC Chile Consejo de Manejo Forestal and ANSAB Nepal.

certification, obtaining support for ecosystem services stewardship and supply of the claimed benefits, quantifying these ecosystem services, responsible management of forest ecosystem services and mentoring for forest ecosystem services and the impact of management practices thereon. Essential to this is the development of suitable standards and generic compliance indicators for ecosystem services certification both at the national and international level. In addition, newly developed impact indicators and methodologies to assess ecosystem services supply and management impacts are used to demonstrate positive outcomes and the achievement of social and environmental objectives. The results will be disseminated and capacity built through materials and workshops. The pilot projects also aim to enable the business model and surrounding, supporting platforms of actors to be tried and tested, if they are able to reward stewardship and the supply of ecosystem services.

5.2.2 Detailed innovation history

FSC certification is a chain innovation as it offers forest managers rewards for managing their forests in a sustainable way. In 1990, a group of stakeholders in California identified a need for a credible system for identifying acceptable sources of forest products. In 1993, the Forest Stewardship Council was launched, followed by a set of Principles and Criteria for certifying forests. FSC certification is one of the most widely accepted certification schemes, historically most favoured by conservation NGOs because it promotes some of the most stringent environmental and social standards for forest management compared to other schemes (Holvoet and Muys, 2004; Clark and Kozar, 2011). FSC certification is not the only innovation of this type, with other certification schemes accepted by a number of governments as proof of legality and sustainability of timber products including the Canadian Standard Association (CSA), the Malaysian Timber Certification Council (MTCC), the PEFC and the Sustainable Forestry Initiative (SFI).

There are variations between schemes: the CSA is national in scope, compared to PEFC which is an international umbrella organisation for the assessment of national certification schemes. Within PEFC the criteria for national schemes are developed by their stakeholders, so vary according to the type of forest and local socio-political factors. The 'success' of FSC certification has been much lauded (Synnott, 2005; Van Kujik *et al.*, 2009; Oldenburger *et al.*, 2010). Since 1993, FSC certified forests now cover 12% of all tropical forests (Forest Stewardship Council, 2012), however only around 0.4% of global tropical round wood production is certified (UNECE and FAO 2011). FSC certification is much lower for tropical and subtropical biomes with 11.5% of the total forest area certified, compared to 52% of boreal and 37% of temperate biomes (Forest Stewardship Council, 2012).

FSC is globally the largest certification standard in the timber market. Another certification scheme, the Program for the Endorsement of Forest Certification Schemes (PEFC) is more successful in certifying pulp and paper products (Auld *et al.*, 2008). In 2012 FSC had 1164 certificates, covering 166,741,332 ha in 80 countries. Temperate and boreal zones continue to dominate both in terms of area and number of certificates in 2012 with 25.6% of certificates located in tropical and subtropical biomes, the majority of which are natural forests. Africa, Asia and Latin American and the Caribbean together accounting for 28% of certificates, 15% of area and 39% of the number of forest areas (Forest Stewardship Council, 2012). These sorts of differences reflect variation in the regions that the products originate from with predominance on temperate forests, and the relative engagement of different sectors with certification schemes. To place these figures in context, the FAO estimates that 104 countries and areas, together accounting for 62% of the world's forests provided estimates of the area under sustainable forest management for 2010. Due to differences in definitions, it is not possible to compare the results by country or to generate regional or global totals.

The proportion of the forest area considered to be under sustainable forest management by region is lower in tropical West and Central Africa, South and East Asia and Central America, than temperate areas. However the 82 countries providing data clearly indicated a positive trend in the total forest area considered to be under sustainable forest management (FAO 2010). Global statistics indicate

that measured by area certified, in November 2007, PEFC- and FSC-certified lands totalled nearly 300 million hectares, approximately 7.6% of the world's forest cover, 5.2% and 2.4% of the world's forest cover for the respective schemes. For forests allocated for production, the proportion certified jumps to 23%. Disaggregating by country and program reveals that Canada alone accounts for 40% of the area certified with PEFC endorsement; European and Scandinavia countries account for another 28%. Brazil contributes less than 1% to the PEFC total, which represents approximately 0.2% of the country's total forest cover. For areas FSC certified, Canada also has over 21% of the total (20.2 million ha) as of November 2007. With the Russian Federation, Sweden and the United States contributing an additional 10% each, together, these four countries account for nearly 62% of all FSC certified lands. In total, for 2006, industrial round wood production from certified sources—both the FSC and PEFC neared 370 million m³ (23% of the world's annual production); rising to 385 million in 2007 (24% of annual production).

The ForCES inception workshop at RECOFTC, Bangkok marked the start of the project in 2012. By the end of 2015, FSC aims to have in place an enhanced global system for forest managers which targets key ecosystem services with present or future market potential and we will have successfully certified demonstration sites for ecosystem services. The positive impacts and added value of FSC certification will also be demonstrated to forest operations and local communities. Key outputs of the ForCES project will be: generic and national indicators for the management / monitoring of ecosystem services; a methodology to assess social and environmental benefits of FSC certification; a viable business model for rewarding the provision of ecosystem services. The overall objective of the Ecosystem Services Program is to increase the applicability and relevance of FSC certification for forest management activities focusing on the provision of ecosystem services. Program activities include the strategic analysis and testing of existing as well as innovative approaches for FSC towards certification indicators, monitoring methodologies and reward mechanisms and bundles a number of previously unconnected projects and activities. A cornerstone of the Program is the 'Strategic Framework for an FSC Climate Change Engagement' that has been finalised in 2011 and will be implemented over the coming years. This provides directions for the Secretariat on where and how to engage in the rapidly evolving sphere of climate projects, intergovernmental negotiations and forest carbon standards.

5.2.3 Triggers and drivers, opportunities and barriers

The origin and initial driver of FSC was the need for a credible system identifying sustainable sources of forest products, largely driven from a conservation perspective. This driver is still relevant today, and has been augmented by consumer willingness and demand for such products, as well sensitivities in the chain to multiple triggers such as corporate philanthropy, corporate social responsibility, reputation and risk management, shareholder and consumer pressure (Johansson, 2012), environmental governance (Marx and Cuypers, 2010) and concerns about the links between sustainable forest management, deforestation and climate change (Seymour and Forward, 2010). A major incentive for timber producers to seek certification is the price premium: where certified goods are seen as more desirable to consumers they can be sold at a higher market price. Rewards take the form of price premiums, improved access to environmentally sensitive markets, to governments and leading businesses which specify FSC certified materials as part of their purchasing policies (see Section 5.4 for Dutch public procurement policy for timber products). In innovation relating to ecosystem services is that under the standards and principles of FSC, the majority of ecosystem services are either explicitly or implicitly incorporated into certification and the operations of prediction organisations obtaining certification. The ForCES project is additionally innovative as its aims to create a new product (certified ecosystem services) and to create a market for them.

Triggers for the inclusion of ecosystem services in the FSC principles and standards have been driven by the ethical concerns of the FSC members. Further triggers for the ForCES project include

awareness by FSC members that ecosystem services are not dealt with holistically in timber concessions or by current FSC certification possibilities. Also that the methods to value ecosystem services are still debated and that the values and impacts of certification on ecosystem services need to be more explicit than is currently the case in FSC certification. Also it was triggered by the tendency of voluntary, PES type schemes concentrating on individual ecosystem services e.g. carbon, watershed, tourism (Merger *et al.*, 2011) and on un-integrated bundles of ecosystem services. The ForCES project was mandated by a membership motion at the 2008 General Assembly, thus has broad multi-stakeholder member support.

Drivers for FSC to address ecosystem services specifically in the ForCES project are that FSC sees this as continuing to contribute to its mission and matching the strategic choice to open the scope of FSC, by providing other additional (certified) revenue streams for beneficiaries, maintain forest biodiversity and ecological processes, and contributing to and livelihoods. It fills gaps in FSC current range of services, as it does not provide specific ecosystem Services management guidelines, a methodology for quantifying ecosystem services or a market based reward system for ecosystem services. Another driver is the High Conservation Value forests (HCV)¹⁸ concept which makes more explicit and agreed the value of ecosystem services. HCV embraces environmental and social values that are considered to be of outstanding significance or critical importance (Jennings *et al.*, 2003; HCV Resource Network, 2011.).

A major barrier to further integrate ecosystems services more explicitly into the four current types of certification types listed above, is that there is little evidence to show the impact of certification on ecosystem services (Nelson and Martin, 2011; Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, 2012). The effects of certification on ecosystem services have not been measured, although studies investigating their environmental and social impacts do provide some evidence on a number of the elements of ecosystems services (Kruedener, 2000; Bass, 2001; Auld *et al.*, 2008; Klooster, 2009; Blackman and Rivera, 2010; Nelson and Martin, 2011; Adekundu *et al.*, 2012; KPMG, 2012; Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, 2012).

Bodegom *et al.* (2008) and Bauhaus *et al.* (2012) conclude that tree plantations can meet the needs of a broad range of stakeholder groups, and if appropriately planned, designed and managed (with FSC noted for meeting specific social and environment services and goods), can deliver a wide range of ecosystem goods and services on both landscape and stand scales. However, they also note that the benefits and impacts of plantations are highly context specific and need to be viewed in a landscape context. Forest plantations provide supporting and regulating services, but cannot replace all the services that would have been provided by the original natural forest. However, an integrated landscape approach makes it possible to reduce the negative environmental effects of plantations. Auld (2008), highlight that while audits of certified concessions have been shown to protect of HCVs, researchers have so far been sceptical (Auld *et al.*, 2008) that certification plays a significant role in ecosystem services at the landscape level and that the data available makes it is difficult to draw strong conclusions. The results of these studies are thus generally inconclusive and highly context specific, with tentative conclusions indicating that certification appears to benefit biodiversity and some positive social and environmental gains noted.

A study on the biodiversity impacts of certification (KPMG, 2012) highlights that although the evidence is weak and that the direct relationship between certification schemes and their impact on ecosystem services has not been explored, a focused analysis per commodity and field research on associated ecosystem services is needed. This study highlights that the long term effects remain uncertain as certification agencies, forest managers and the research community have not yet

¹⁸ High Conservation Value forest is an FSC term to delineate forests with environmental and social values of significant importance.

implemented sound approaches to monitor the impact of certification specifically to address all aspects of ecosystem services.

Partners in the ForCES project are very conscious that awareness and promotion of FSC certification for ecosystem services will be a major factor that helps create demand for the scheme and that low demand can act as major barriers to uptake of the innovation. A further barrier is that the low level of certification for imported tropical timber, which means that the impact of certification remains modest (see Section 4.3).

Further barriers to integrate ecosystem services into FSC are:

- Making the implicit ecosystem services in certification more explicit, whether as part of FSC certification or in their own right in combined bundles, such as ForCES, or through bundles of ecosystem services (e.g. Carbon and REDD and FSC timber), or through bundling as part of other PES type schemes. This will depend on the needs and objectives of buyers.
- Ecosystem services is a complex subject with a terminology that is off-putting for most laymen (and even professionals), thus a challenge is to make the concept (and its relation to value chains such as timber) easier to understand for actors in the chains¹⁹
- Specific challenges for the ForCES project are to develop capacity and skills (to measure, value and monitor ecosystem services, certify and trade them), understanding and an innovative product and market at the same time.
- The ForCES project highlights that first the nature and value of ecosystem services specific to a particular location need to be confirmed, prior to their being commoditised and traded. As valuation methods are still debated, and only a limited number of ecosystem services have 'markets' (typically watersheds, HCV with tourism value, carbon, timber and some NTFPs) these are considerable barriers to be overcome. Issues such as how owners, can trade and benefit from payments for such ecosystem services, and how to avoid exclusion of current beneficiaries who may be unable to pay (for example, water or NTFP users in adjacent communities or watersheds), raises a number of difficult issues to be solved to make such ecosystem services certification schemes feasible, and will mean that their operation varies from country to country and region to region.
- 'Seeing through the trees' of the many different certification schemes and sustainable forest management initiatives is difficult. As many commentators have indicated (Jennings *et al.*, 2003), the plethora of initiatives tropical forests international, regional and national mechanisms to inform governments and the timber industry about methods to reduce the impact of production forestry on aspects of ecosystem services has made it difficult to judge which ones are most relevant and contributed to the generally slow adoption of SFM practices in some regions such as Asia. Recommendations include making these specifically targeted to local conditions, understanding and practices - with only a few countries having incorporated the guidelines into national legislation. Despite this rich and sometimes bewildering choice for consumers and the timber sector choice, the Dutch policy has focussed on one system, FSC. This can be seen as a potential limitation of both choice and impact.
- Several interview actors and literature indicates that there is insufficient, science based evidence proving the impact of certification on ecosystem services reveal the need for studies to confirm the impact and causal pathways.
- Currently the FSC chain of custody guarantees a product and allows traceability, rather than being a guarantee of sustainability all along the chain. Thus organisations and governments using it as a chain-wide sustainability enhancing tool need to be aware of its limitations and address sustainability and issues of ecosystem services along the chain using other instruments.
- Pricing ecosystem services such that the value reflects their worth, but is also affordable and stimulates a market, is a major challenge. This is particularly for some types of local users (e.g.

¹⁹ See exchanges and suggestions on http://www.espa.ac.uk/blog/201209/37671?utm_source=Common+Cause+Newsletter&utm_campaign=52be2e8086-October10_30_2012&utm_medium=email

local communities of water or soil fertility services from timber concessions) who may not be able to may object to paying, which may then deter concession holders from actions that continue to support such services.

- A thorny issue in certification has been the use of criteria linked to processes and production methods (PPMs), which have been seen by the world Trade Organisation (WTO) as restricting competition. WTO Members agree that countries are within their rights under WTO rules to set criteria for the way products are produced, if the production method leaves a trace in the final product, for example cotton grown using pesticides leaving pesticide residue in the cotton itself. However, they disagree about discriminatory measures based on 'unincorporated PPMs' (or 'non-product related PPMs'), i.e. process and production methods which leave no trace in the final product. For example, it cannot be ascertained whether a table has been produced from sustainably managed wood by simply looking at it. There is thus an on-going debate and potential significant barrier for certification, of whether certification (and other eco-labels) is consistent with WTO agreements. Many countries argue that measures which discriminate between products based on unincorporated PPMs should be considered inconsistent with WTO agreements²⁰.

Opportunities to further integrate ecosystem services include:

- The increasing recognition of ecosystem services is reflected by a decision of the FSC membership in 2011 to include specific references to ecosystem services provision in the FSC Statutes and By-Laws. Although there is a high level of integration of ecosystem services in the current FSC standard and principles (see Annex 3). The current low coverage of FSC in tropical timber producing regions (Section 5.5.2) means that there is plenty of scope for out-scaling the coverage of FSC certification to more consumers and to increase certified production.
- The TEEB study highlighted that a higher public awareness of biodiversity and ecosystem services is leading to changing consumer preferences and purchasing decisions. As a result of this growing numbers of businesses, government and NGO initiatives have been initiated. For example IDH, the Dutch Taskforce on Biodiversity and Natural Resources from 2009 to further to the 2007 Biodiversity Policy Program, and the 2006 appeal by Leaders for Nature initiated by IUCN NL. The Taskforce looked for the best ways and methods of using biodiversity sustainably. Its findings have formed the basis of a set of recommendations, issued to the Dutch government in December 2011, and for targeted actions thereafter. The main proposal relating to timber value chains was a tax on unsustainably produced timber²¹.
- The FSC's revised P&C now refers explicitly to ecosystem services by requiring forest managers to maintain, conserve and/or restore ecosystem services.²² The results of the ForCES pilot projects will ensure even higher and specific level of attention.
- There is a considerable variation in the types of timber and presence of certification in production and supply markets worldwide. Only a fraction of timber originating from certified sources reaches the market carrying a certified logo. The Dutch market is one of the exceptions, where both the FSC and the PEFC had 10% to 20% market shares for labelled products. The VVNH reports²³ that sustainable imports of timber from 2007 to 2011 have increased from 45% of total imports in 2007 to 77% in 2011. The aim to meets product (softwood, plywood and hardwood) targets such that by 2015, 100% of the softwood, 85% of plate material and 50% of hardwood imported are demonstrably sustainable (FSC or PEFC).
- Continued multi-stakeholder promotion and support of current forms of certification, such as FSC, which promote the integration of ecosystem services. Such promotion needs both to focus on

²⁰ http://www.wto.org/english/tratop_e/envir_e/labelling_e.htm#top

²¹ Sustainable timber is defined as that meeting criteria formulated by the Netherlands Timber Procurement Assessment Committee TPAC (2010). Dutch Timber Procurement Policy Framework for Evaluating Evidence of Compliance with Timber Procurement Requirements, Timber Procurement Assessment Committee.

²² <http://www.fsc.org/ecosystem-services.124.htm>

²³ <http://www.vvnh.nl/duurzame-vvnh-import-2011>

stimulating supply (the certification of more concessions) and on creating continued demand (consumer, business to business and government).

- Support for specific ecosystem services certification as an innovative product, could be interesting for timber concession owners as it diversifies the products obtained from concessions and could create additional revenue streams, whilst having positive environmental and social benefits.
- FSC and partners indicated that initial responses from market analysis indicate that there is a demand and appetite for ecosystem services certification.
- Using pilots and test cases of demonstrate the value of ecosystem services and how they can practically be implemented, particularly so that ecosystem services are understood and valued both intrinsically and translated into common, tradable values i.e. in monetary terms.
- Raising general awareness about what certification entails (including the costs and benefits) and how it impacts ecosystems services.
- Once and if ForCES resulted in certified ecosystem services this could also be a measure that is supported and promoted as a more direct way of integrating ecosystem services, similar to REDD+ and other individual ecosystem components (e.g. carbon trading) as a voluntary mechanisms.
- Linking ecosystem services in chains with other commodity chain specific platforms, initiatives and roundtables and with other PES type activities such as REDD+ may be a possible way to extend a focus from one specific ecosystem service (e.g. carbon, REDD, timber) to bundles of products and services.
- Bilateral policy makings such as the VPAs offer a model for how ecosystem services could be integrated into the timber chain.

5.2.4 Process dynamics

As FSC is an international, voluntary membership association governed by its members. These members may be organizational – meaning that they represent their institution or organization – or individual. Members include companies (timber dealers, transporters, processors, retailers) and NGOs (WWF, Greenpeace, SMN, and ICCO), timber and forestry organizations, indigenous people's organizations, community forestry groups as well as individual forest owners and interested parties. It is notable that members originate from diverse backgrounds. Members apply to join one of three chambers – environmental, social and economic – which are further sub-divided into northern and southern sub-chambers. Each chamber holds 33.3% of the weight in votes; and within each chamber votes are weighted to ensure that north and south each hold 50% of the votes. In FSC NL companies include Royal Dekker, VolkerWessels Stevin NV, Kompan BV, Unions FNV Meubel & Hout, CNV Vakmensen, NGOs (Vereniging Milieudefensie, Stichting Greenpeace Nederland, Wereld Natuur Fonds, ICCO) and a state organizations (Staatsbosbeheer).

Whilst FSC is independent of Dutch government and policy, links can be seen. For example, DGIS, together with the World Bank and other government bilateral aid partner are supporting Forest Sector Development plans in countries such as Vietnam, to promote forest certification by setting up village funds to finance consulting services to carry out certification pre-assessment and assessment, as well as periodic surveillance audits, training for local staff in auditing of certification standards, market promotion of the certified products for export, and development and maintenance of a databank of certified forests.

ForCES is a project bringing together a wide group of actors in the chain. ForCES involves the development of science based certification models based on market assessment and business model development. They will trial the challenges of certifying different types of forest management models (concessions, industrial timber production, traditional timber production and protected areas in different forest habitats with main differing ecosystem services), this sets up pilots which are then prepared and implemented on a national level, followed up a two year process of awareness and promotion of the ecosystem services certification standard. In the ForCES project the actors are a

mix of conservation and research partners e.g. Netherlands Development Organisation (SNV), World Wildlife Fund (WWF), Centre for People and forests (RECOFTC), Centre for international forestry Research (CIFOR), Asia Network for Sustainable Agriculture and Bioresources (ANSAB), Federation of Community Forestry Users (FECOFUN), National Trust for Nature Conservation, Relief International), the ministries of forestry in the countries, FSC international and national, international organisations (United Nations environment Program (UNEP).

Whilst forestry concessions are mentioned as partners, specific companies are not named and the role of the private sector, governments. Others possible buyers (governments, NGOs, private sector etc.) of ecosystem services certification are not yet defined, but the appetite of different types of buyers for certified ecosystem services is gauged as a later part of the project, to implement the innovation. FSC indicated that this is a classic market innovation challenge and a chicken and egg” problem: to develop attractive certified ecosystem services products (either individual services or in bundles) the buyers need to know what the services are on offer, and equally, to stimulate or create consumers, products have to be offered. Thus project thus works iteratively developing both product supply and demand at the same time. Market analysis of ecosystem services in the case countries and then globally aims to help further define who the buyers of ecosystem services could be.

5.2.5 Learning processes

Learning has occurred at a chain level during at FSC annual meetings, periodic evaluations and projects and on a site level through certification audits. Similarly, the audits and evaluations conducted by Probos, VVNH and as part of the IDH also feed into learning as part of their monitoring and evaluation activities to meet the sector goals for import of sustainable timber. VVNH is a member of the Taskforce on Biodiversity and Natural Resources and also involved on in European level platforms. However, as the focus of Dutch imports is largely on sustainable timber and on biodiversity, and not on ecosystem services generally, specific learning, actions and innovations on ecosystem services appear limited.

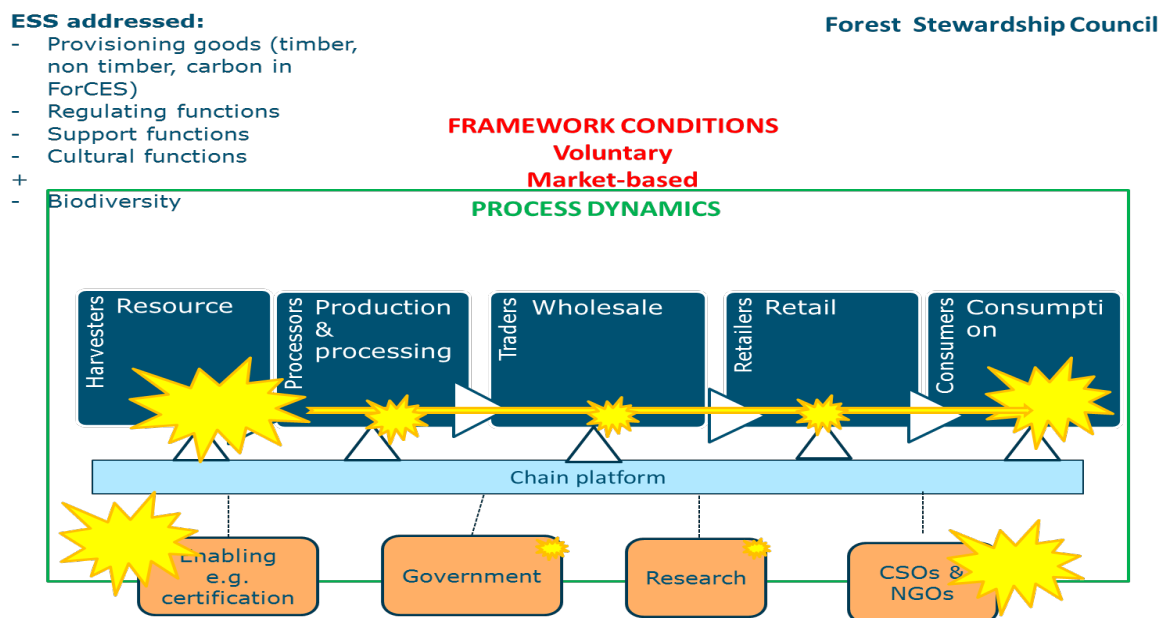


Figure 8 FSC and innovations in the international tropical timber value chain

KPMGs report on certification and biodiversity (KPMG 2012):47) draws lessons also relevant to ecosystem services in the timber, and other tropical commodity, chains. It states

"The increasing business understanding of the impact on biodiversity of certification and specific issues relating to ecosystem services (including better definitions and monitoring) may contribute to obtaining better results and could be part of the mainstream agenda. However, we have learned from our consultation process that it is important to consider certification and biodiversity in its context, looking at specific commodities, regions and producers. Without this the mainstreaming of sustainable sourcing may be blocked by raising standards too high through focusing on new and complex issues too early in the process."

The ForCES project has a strong learning element, being both iterative and building in regular meetings and annual evaluations on progress which guide the further development of valuing and certifying ecosystem services.

5.2.6 Conclusions

1. Ecosystem services are implicitly and explicitly addressed in FSC standards and principles and even more in the pilot project 'Expanding FSC Certification to Ecosystem Services'.
2. FSC is an innovation implementing chain wide responsibility and traceability for ecosystem services (mainly implicitly in FSC and very explicitly in ForCES), with a focus on forest ecosystem services at production level and on the consumer 'buyers' of these services.
3. This innovation is a good example of a multi-stakeholder innovation and learning from deliberate change process for the chain, involving companies (timber dealers, transporters, processors, retailers) and NGOs (WWF, Greenpeace, SMN, ICCO).
4. The roles of these diverse stakeholders have been to jointly develop and implement FSC standards, criteria and implement the certification. Additional stakeholders have been involved in implementing the pilot ForCES project, bringing in national government perspectives and ownership, research and development. Notable by their absence in the innovation is the consumer- whether of (certified) timber or ecosystem services. As these are market led initiatives, engaging the consumer so that they see a need and are willing to by ecosystem services (directly in the form of ecosystem services certification to pay for it indirectly through FSC type certification) is essential.
5. ForCES uses the concept of bundles of ES, distinguishing it from single ES based certification schemes e.g. timber or carbon with the aim of adding value and increasing the market attractiveness.
6. Although FSC now covers 12% of all tropical timber producing forests, the scheme covers only 0.4% of global tropical round timber production. However, at the consumer end of the chain in the Netherlands in 2012, a higher proportion of the market (36% hardwood imports) is FSC certified. The Dutch focus on mainly FSC, to the exclusion of other certification or sustainability initiatives, means the impact of public procurement and IDH are tied to the success in up scaling and extending FSC. Experiments with positive impacts of competition to scale up and cover a higher proportion of timber production have not been made.
7. Dutch government support to further promote ecosystem services in certification such as FSC is limited, as it does not have any control or involvement in the standard or organisation. However it could take the form of collaboration or partnership, supporting pilots, building capacity and tools to calculate ecosystem services values, supporting studies of values, monitoring the impact of certification on ecosystem services, developing markets for ecosystem services certification and raising consumer and public awareness about ecosystem services. Issues to be resolved with this approach are the legality and status of certification in limiting competing and giving preference to one standard above another.

5.3 Initiative for Sustainable Trade and the Sustainable Trade Action Plan

5.3.1 Background

In September 2009, 54 Dutch and international companies, NGOs, trade unions and trade bodies wrote to the Dutch government calling for a joint sustainability agenda for international trade. This multi-stakeholder group proposed to combine forces in the coming years to together work on the sustainability of commodity flows, including timber. This resulted in the Sustainable Trade Action Plan (STAP)²⁴, supported by a large group of companies and a number of leading NGOs, trade unions and industry organizations. The Action Plan is coordinated by the Initiative for Sustainable Trade or IDH (denounced from its Dutch name *Initiatief Duurzame Handel*). IDH has received 105 million € funding grant from the Dutch Ministry for Development Cooperation for the scoping, development and implementation of public private, pre-competitive market transformation programs in 16 sectors, including the tropical timber chain. The IDH investments in market transformation programs are 1:1 match funded by private companies. The role of the government is indirect but strong as IDH is charged with implementing Dutch government policy. IDH is a trade-driven tool seeking to transform markets towards sustainable production and consumption, seeking to deliver impacts towards the MDGs, and thus in support of a development agenda.

5.3.2 The innovation relating to ecosystems services

This innovation has two major facets. One is the formal and informal bringing together of the main Dutch actors in the value chains of different commodities and products, of which timber is one, to increase the sustainability of trade. The second innovation concerns the method of financing the Action Plan, which relies on an impetus from the government to support own contributions from private sector stakeholders in the selected chains. Whilst innovative for the timber chain, the approach is also to an extent tried and tested, as a similar approach is occurring in other commodity chains important for the Dutch economy (soy, cocoa, tea, coffee etc.).

Whilst ecosystems services are not at all explicit in the STAP, because of its focus on sustainability, there are many implicit references to elements of ecosystem services. The STAP explicitly uses a multi-stakeholder platform, in which IDH as the main organisation implementing the envisioned change has a role to act as a broker and to promote learning.

The innovations stimulated by the STAP and IDH have occurred all along the chain and among all actors, although they dominate at the beginning and the end of the value chain. As it is concession holders that need to initiate the process of certification, the most involved actors are timber processing companies, followed by the other actors in the so-called chain of custody up to wholesalers and retailers. Certification bodies (namely the FSC) and support actors, those advocating the supply and stimulating demand for certified timber, are also important actors. The segments and actors in the chain most implicated are shown by the larger innovation 'stars' in Figure 9.

²⁴ <http://www.idhsustainabletrade.com/hout-program>

ESS addressed:

- Provisioning goods (timber)
- Via FSC
- Goods (timber, non-timber)
- Regulating functions
- Support functions
- Cultural functions

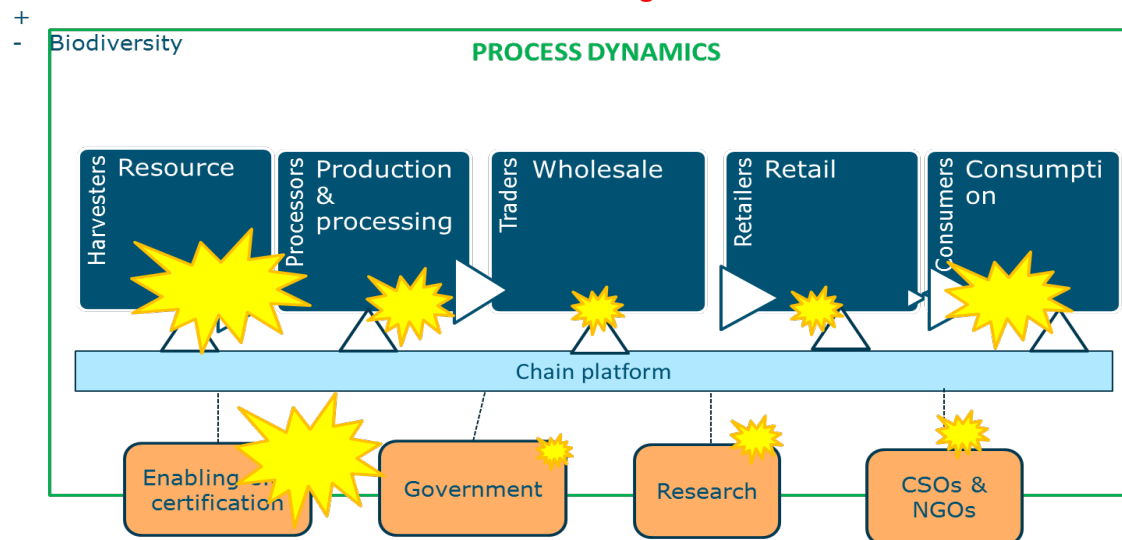


Figure 9 Sustainable Trade Action Plan (STAP) and innovations in the international tropical timber value chain

5.3.3 Detailed innovation history

The IDH Tropical Timber program focuses on sustainable forest management. Its three overall aims are to achieve 600,000 ha of sustainable certification for local small producers, to certify 13 million ha of tropical forest certified and to achieve a target of at least 50% of tropical timber on the Dutch market with a minimum of 50% sustainable (i.e. certified) by 2015.

The program consists of five elements organised into three tropical timber programs in the Amazon (The Amazon Alternative, TAA), Borneo (The Borneo Initiative, TBI) and the Congo Basin (the Congo Basin Program, CBP), through which concession holders are supported in sustainable forest management. The Amazon Alternative aims to FSC certify 2.5 million ha of tropical forest the Amazon region and to increase the volume of FSC certified Amazon timber on domestic, Dutch and European timber markets. TAA works on a number of additional supporting strategies, such as increasing efficiency and improving value chain finance. The Borneo Initiative aims to accelerate sustainable forestry management through FSC certification of an additional 13 million ha in Indonesia, engaging with all major stakeholders in the process in Indonesia and Europe to make certification a success. In this, TBI aims to link its activities to existing trends in the sector and facilitates market links between Indonesia and Europe. The Congo Basin Program (CBP) supports concession holders on their way to responsible forest management and the certification and works on additional supporting strategies, such as local processing, commercial partnerships between companies and communities, capacity building of local NGOs and further development of regional and national FSC standards. The Linking Europe program aims to increase the uptake of sustainably certified tropical timber by 10% in three European countries. It focuses on two important sectors for tropical timber: the do-it-yourself sector and the public sector. Because of their large market share and/or influence, a limited number of partners in both sectors have the potential to change the wider market.

The innovation introduced into the chain by IDH and STAP is thus specifically focused on change, recognises the role of lead-actors and the distribution of decision-making power and influence in the chain. FSC Netherlands is a key stakeholder in IDH and aims to increase the demand for sustainable tropical timber in the Netherlands. Sufficient demand is an important success factor for sustainable forest management in the production countries (see Section 5.2).

5.3.4 Triggers and drivers, opportunities and barriers,

The trigger of the STAP was the stimulus given to multi-stakeholder partnerships on a chain level by the Dutch market-focused government development and economic policies. A trigger was the agreement between companies, their associations, civil society and politicians on the essential, supporting role of the government in sustainable trade. A discussion in September 2010 between companies, NGOs and governments was a logical next step towards implementation of the Action Plan and setting up IDH. By joining forces to work together with a long term perspective on sustainability within commodity supply chains, coordinated by IDH²⁵, enterprises aimed to carry forward initiatives set in place during the term of the previous cabinet, and improvement programs started up in seven commodity sectors by IDH, including tropical timber. Stakeholders wanted to ensure continuity between the old and new Cabinet policies, achieve more coordination, garner political support and, critically, financing for work they proposed to enact in the future. By focussing on commodity flows in which The Netherlands have a strong market position, they highlighted that these actions could achieve "win-wins" of contributing positively to the Dutch economy and sustainability. The driver of the process is arguably, the massive matching funding, which eases collaboration, technical support and studies, that the government injects into this process.

A major barrier to further address ecosystem services is that the IDH definition of sustainability does not explicitly address ecosystem services. IDH and its partners equate sustainability in chains with certification. This was illustrated both by interviews and by the statement on their website: "Trade in certified sustainably produced timber and other forest products is a proven mechanism for promoting sustainable forest management". The STAP has therefore stimulated certification (specifically FSC) as the way to achieve sustainable timber imports in the Netherlands and Europe. Other timber certification schemes such as PEFC are not seen by IDH and WWF (one of its partners and one of the original 2009 letter signatories) as sufficiently robust. This means that indirectly ecosystem services are addressed through FSC certification, as FSC does explicitly address ecosystem services (see Section 5.2). The risk of this indirect strategy is that if demand for FSC declines or is not maintained for whatever reason (costs of certification, financial crisis, reputation loss etc.), the STAP targets will be difficult to meet and per se, the support implicit for ecosystem services that certification offers will then not occur. A related barrier is that ecosystem services are not addressed in the tropical timber value chain by the IDH activities as they are not explicit or an attention point. Studies to date provide only weak evidence that that (FSC) certification does have benefit ecosystem services and biodiversity (Eriksson and Hammer 2006; KPMG 2012) (see Section 5.2 for more information).

Other barriers include the decreased demand for timber linked to the global financial crisis (Cattaneo *et al.*, 2010), which places pressure a struggling sector, due to the additional financial costs commonly associated with certification (Klooster, 2005; Ebeling and Yasué, 2009). Another barrier is that whilst IDH and STAP have thrown their considerable resources fully behind addressing the chain from both ends: driving supply and demand for certification as the way to achieve sustainable chains (and thus indirect address ecosystem services), by focussing on just one certification scheme as the main way to achieve sustainability, other, perhaps more effective or direct ways of increasing sustainability and (by interference) ecosystem services are not used or are ignored. This is highlighted by an assessment of the impacts of certification on biodiversity (KPMG, 2012). The main

²⁵ See Letter to House of Representatives re Sustainable Trade Action Plan 2011-2015 Public-private partnership for sustainable commodity chains from Joost Oorhuizen, Director IDH, Utrecht dated 24 June 2010.

explanation of the singular focus on just FSC appears due to the conviction of WWF, one of the IDH founders, that FSC is the best certification and most sustainable scheme for timber.

A driver is a monopolistic support and mandate by IDH and thus implicitly the government, for only one certification scheme). There are other schemes available (Blue Angel, Eco Institute, Environmental Product Declaration, EU Eco label, FSC, Program for the Endorsement of Forest Certification schemes (PEFC) and Rainforest Alliance). All of these certification schemes and eco-labels are active in the Netherlands and consider environmental impacts, including biodiversity, to some extent (KPMG, 2012). Rainforest Alliance and FSC are the most explicit in terms of addressing ecosystem services and their conservation.

The effect of this strong mandate for FSC from multiple partners in the tropical timber value chain acts as a barrier to competition among schemes. Competition however, has long been recognised as a tool to stimulate market forces to determine best practice most efficiently (Vermeulen and Kok 2012). This creates a paradox that while the Dutch policy and STAP promotes market-led policies and aims to even the playing field by supporting companies to achieve certification, it creates an uneven playing field by restricting in practice itself to one certification scheme.

5.3.5 Process dynamics

The IDH takes a long term approach of five years and is as such, unusual for a policy instrument. It adopts a consensus and partnership seeking approach involving multi-stakeholders. It does however exclude or minimises some stakeholders (e.g. research, opponent civil society).

The five programs aim to make sustainable timber (and thus include implicit attention to ecosystem services) the norm within companies in the chain. It aims to cover the costs and risks of being front runners in an uneven playing field (one where certification is still, as shown in Chapter 4, the exception rather than the norm). As certification can be seen be competitively advantageous, but also a considerable business risk, the IDH and STAP aims to cover these costs and provide technical support to ensure the supply and demand for (FSC) certified tropical timber from the three main sources worldwide.

The actors in the innovation are expressly multiple and chain wide. IDH balance its aims with those of its diverse partners and board members, which include (as the main focus in the timber chain, direct actors such as concession holders and processing companies in the Netherlands. They are supported financially and technically (the matching funds) in achieving sustainable certification. Processors training in logs from (almost) certified concessions, traders and retailers (i.e. DIY stores) are also partners in STAP. Links are made to the Dutch construction sector through supply side programs to make sustainable timber purchase the norm, to governments (in Europe) to also stimulate sustainable public procurement (See Section 5.4 for more information), to NGOs as implementing or strategic partners to cooperate with or provide services to the program. IDH has also been active in searching for other (international and national funders) to increase the matching capacity.

Other actors include conservation focused NGOs such as WWF and development actors such as ICCO and Solidaridad are involved. These partners help legitimate and some reported being often invited to comment and provide feedback, but are largely not involved in implementation and receive little funding. They therefore have an opportunity, albeit limited, to influence the integration of ecosystem services, when specific aspects coincide with their organisational agenda's.

5.3.6 Learning processes

It is notable that learning is a key element of the strategy of IDH. IDH aims for high-impact, result-oriented learning agenda together with sector specific stakeholders. The learning program works on two levels: within sectors and between sectors. On both levels, it supports the stakeholders in the three areas of innovation, capacity building and knowledge sharing. Led by IDH and working with stakeholders, a timber specific learning agenda was set up. A strategic review of sustainability in the tropical timber sector was conducted by consultants Price Waterhouse Coopers (PWC) and IDH from October 2011 to January 2012. It did not address ecosystem services specifically, evaluated the impact of certification to date in the tropics and its prospects up to 2030, the financial impacts of certification on companies, and the business case for certification; trends in trade patterns and procurement practices and other means are there aside from certification, to help mainstream sustainable operating practices within tropical forestry; and opportunities for IDH and partners to use market forces to accelerate the transformation of the tropical timber sector.

A key finding was that after 18 years, 6% of the permanent production forest estates of nine key producer countries studied were certified. Even in an optimistic business scenario up to 2030, the majority of forests are unlikely to be certified. The impact of regulatory initiatives, such as the 2013 EU timber regulation introduced recently, may have more extensive implications for operations and the locations where timber is sourced, than certification. Illegal logging is defined as harvesting of timber in contravention of the laws and regulations of the country of harvest. Illegal logging can have significant negative economic, social and environmental impacts, associated with deforestation, climate change and a loss of biodiversity. Although this regulation focuses on ensuring legality of production and not ecological or social sustainability, it could help lift the minimum standards of the majority of forestry operators across the tropics, and help to gradually mainstream sustainable forestry practices, as illegal activities undermine the efforts of responsible operators by making available cheaper but illegal timber and timber products in the market place.

Increased control of timber imports to the EU may also have an impact on the added value of FSC label for chain actors. With these findings in mind, IDH now is focussing in Phase 2 on exploring how to create new, or realise existing, synergies between regulation and voluntary certification; Understanding the impact of regulation on the business case for certification; the potential for bolstering regulation so that it becomes a means of promoting mainstream sustainability within the supply chain: how frontrunners can anticipate and exceed regulations; and any additional steps needed to deepen the positive impacts of regulatory initiatives on the ground. It is again notable that ecosystem services do not figure explicitly in this learning agenda.

At a workshop on sustainable chains²⁶ in April 2012, an IDH learning manager indicated that as commodity chains are managed by the private sector they may not always be able to serve the broad development agenda, and that for certain issues, such as ecosystem services in this case, voluntary standards may not be sufficient. However, it was highlighted that to push forward such agendas, commitment from the business community is required. IDHs approach to provide an incentive in the form match funding, lowers the costs and barriers for sustainability initiatives that are perceived as risky by private actors, and thus promotes new and innovative behaviours.

5.3.7 Conclusions

1. Ecosystem services are not made explicit in the STAP and IDH model. This is also reflected in the absence of discourses on innovation and learning on ecosystem services. In contrast, biodiversity does feature in discourses and is reflected in the Key Performance indicators. This makes it difficult to focus more attention on them. However, as FSC is one of the main channels used in

²⁶ Sustainable production chains and socio-economic development Policy research for linking private initiatives to regional development, 29th march at Kasteel Oudaen – Utrecht, Summary and report of the workshop April 27, 2012, Mark van Oorschot, PBL

- the timber chain to increase sustainability of the chain, this provides a route to make ecosystem services more explicit.
2. IDH illustrates institutional and financial innovations which influence Dutch and international actors and activities in the chain.
 3. The STAP and IDH encourage contributions from all chain actors, although the main focus is on private sector. The government's role is indirect but steering as IDH executes and implements Dutch policy and the STAP is evaluated by DGIS, as an international cooperation activity. The IDH-STAP bring together a wide range of national and international actors in the timber chain and is creating a common agenda that can be useful to create and implement innovations, and that has leeway for (indirect) steering by government via IDH
 4. Power and control in the STAP initiatives lies mainly with business and IDH. Research organisations, civil society and non-government organisations concerned with ecosystem services have less influence. This provides a means for the government to influence the initiative to address ecosystem services more directly. Another option is to provide support to other stakeholders currently less involved, steering them to jointly develop a more proactive (instead of reactive) and explicit agenda with an emphasis on how ecosystem services and biodiversity can be addressed in the chain activities.

5.4 Dutch public procurement policy for timber products

5.4.1 Background

In 2001, Dutch members of parliament decided that the standards used for 'sustainable' timber were not clear enough, and that the Netherlands needed its own certification scheme to ensure sustainable procurement. It was decided to further elaborate the minimum requirements and an independent guideline for certification of sustainable forest management (Beoordelingsrichtlijn voor de certificatie van duurzaam bosbeheer en de handelsketen voor hout uit duurzaam beheerd bos), see Figure 10. Being aware its role model function as a consumer, to increase the share of sustainable produced timber on the Dutch market, the government developed public procurement policy. Two policy goals to achieve this are using sustainability as a significant criterion in all government procurements from 2010 onwards and strengthening the innovative capabilities of the Dutch economy (Ministry of AZ, 2007).

By demanding sustainable products, services and supplies when purchasing, the government is giving the market for sustainable products and services is a major boost. Annually spend the joint authorities spent approximately more than 50 billion euro on the procurement of products, goods and services (KPMG, 2011). In 2008, the timber companies in the Netherlands have imported and processed more sustainable produced timber than in the preceding years (Monitor Duurzaam Inkopen, 2010). This demand for sustainable products, services and supplies by the government sends a major signal to the market. Annually the authorities spent approximately over 50 billion euro procuring products, goods and services (KPMG, 2011). In 2008, timber companies in the Netherlands imported and processed more sustainable produced timber than in the preceding years (Monitor Duurzaam Inkopen, 2010). Public procurement accounts for a substantial part of the economy and is an attractive policy instrument for effecting positive changes in the broader economy and stimulates the production of innovative and sustainable products.

5.4.2 The innovation relating to ecosystems services

The innovation is the use of certification as a way to ensure the sustainability of public procurement of timber, with FSC one of the main certification schemes. Please refer back to Section 5.2.

5.4.3 Detailed innovation history

In June 2004 the Cabinet decided that all national government institutions in the Netherlands, when buying timber, were required to purchase timber from verifiably sustainable sources as much as possible. On June 30th 2005 the Dutch House of Representatives adopted the Koopmans-De Krom resolution, in which the government is obliged to use sustainability as substantial criteria in 100% of national purchases and investments by at least 2010. The central government, municipalities and other governmental organizations have set themselves the goal from 2010 to procure respectively 100%, 75% and 50% of the necessary services and products sustainable. The target was that by 2010 central government would be 100% sustainable, provinces and water boards would have 50% sustainable procurement, moving to 100% in 2015 and municipalities would be 75% sustainable, moving to 100% in 2015.

As a result of the implementation of the procurement policy, two innovations emerged around the timber chain. In June 2008 the then Minister of VROM decreed the principles and criteria for sustainable procurement (Inkoopduurzaamhout.nl, 2012²⁷), based on sustainable forest management, that includes social aspects, ecological aspects, economic aspects and management aspects and control of the chain of custody (CoC). The development, application and management of certification systems (DAM) involve standard development, certification system management, certification bodies and certification procedures and accreditation. TPAS comprises clear and transparent Timber Procurement Criteria for the Chain of Custody (CoC) and for Sustainable Forest Management (SFM), which include legality requirements and a framework of further requirements and decision rules to verify whether the timber comes from sustainably managed sources or, in case the specified timber is not available from sustainably managed sources, at least legal sources.

A Timber Procurement Assessment Committee (TPAC) was set up, funded by the Ministry of Environment. TPAC uses own criteria, including based on ITTO guidelines. The government does not check itself whether timber meet to the government criteria for sustainable produced timber. The primary objective of TPAS is to provide assurance to governmental parties, both national and local, that procured timber comes from sustainable sources or, in case evidence can be provided that sustainable timber is not available, at least from legal sources. In addition, TPAS may also provide this assurance to other timber buying parties like companies and consumers. The TPAC does this by assessing whether existing certification systems meet the criteria set by the national government, using an evidence-based assessment system (TPAS) to determine which timber certification schemes are sustainable, whether they meet the Dutch Procurement Criteria, and further requirements regarding the reliability of these certification systems. It also is charged with assisting, on request, the Government Procurement Officer in assessing evidence for sustainably produced timber and for legal timber. The government ordered the TPAC to assess whether FSC and PEFC timber certification systems meets the procurement criteria for sustainable timber. First all the criteria are judged by TPAC with a score. The score can range from fully addressed till inadequately addressed. Then, based on the scores of the criteria, TPAC awards scores to all the principles. Together these two judgments determine whether a certification system meets the Dutch procurement criteria for timber (2008).

TPAs thereby strongly influences which certification systems businesses in the timber supply chain use. The TPAC assessment method includes an internet stakeholder forum. For each certification system assessed an internet forum was established. In principle everyone can participate if their contribution is substantiated in an admittance procedure. Environmental interest groups, timber companies and other (international) stakeholders were invited to share their practical experiences with certification systems. By sharing their knowledge, TPAC is able to make a well-informed assessment with respect to the relevant certification systems. After the assessment the TPAC report in what way the comments of the stakeholder forum contributed to TPAC's final judgment. SMK

²⁷ www.inkoopduurzaamhout.nl/criteria.html (consulted in December, 2012).

facilitates the stakeholder forum discussion. This has allowed NGOs, supply chain actors, and other stakeholders to share their views on certification systems, such as FSC and PEFC, and whether they agree to recognize a certification system. By sharing this knowledge and experience, TPAC aims to make a well-informed assessment. As it also wants to reach stakeholders in timber producing countries, the language in the forum is English. After completion of the assessment TPAC reports on how they have taken into account the given comments of the stakeholder forum count in its final judgment of a certification system, with final assessment reports placed on the TPAC website.

Stakeholder forums have been held on the Malaysian certification system MTCS in 2009, and also on FSC International, PEFC International, PEFC Austria, Germany PEFC, PEFC Belgium, Sweden and PEFC Finland (FFCS). When a stakeholder disagrees, a protest can be made and sent to the Board of Appeal (*College van Beroep*) of the Association of Environmental Trademarks (*Stichting Milieukeur*, SMK). The Board of Appeal has been used by NGOs and certification systems to appeal against decisions made by TPAC. Organisations can and have investigated whether the Dutch national, regional and local governments and timber industry accomplish the procurement policy, and investigate the practical implementation of the code of conduct (included the penalty system and the independent Binding Advisory Committee (*Bindend Advies Commissie*). The TPAC gives advice to the secretary of State who finally decides whether a certification system is approved. District Courts can also overrule the decision of the Secretary of State. For example, Greenpeace brought proceedings against a decision because, according to Greenpeace, the Secretary of State ignored the opinion of the TPAC. TPAC currently accepts FSC International and PEFC International (with the exception of MTCS, which has been reviewed by TPAC as non-compliant with the criteria) as acceptable certification schemes. Greenpeace together with NCIV, ICCO, WWF had objected (to the Appeals Board) against the positive assessment of the Malaysian certification system MTCS by TPAC (ICCO, 2012²⁸). The Board of Appeal then decided that the consultation put forward new facts and that the assessment of MTCS by TPAC should be re-examined. Ultimately it is for the Minister or State Secretary of Infrastructure and the Environment to decide to take over the judgment of the Board of Appeal.

A working group with representatives from the Probos Foundation and the government (RWS, RGB, Dienst Vastgoed Defensie, DLG, VROM and SenterNovem) developed statement of work specifications for sustainably produced timber. Since September 2012, the Foundation STABU formulated in the administrative part of its standard statement of work for housing and utility, a specification relating to sustainable produced timber (Probos, 2012²⁹). This means that every author of a statement of work can use this specification in its statement of work for procurement. STABU also develops RAW standard statements of work for civil engineering. The Probos Foundation works to ensure that CROW specifications regarding sustainable produced timber are included in the RAW statements of work.

A database has been developed to help government buyers, timber suppliers and users (such as architects and construction companies) purchasing sustainably produced timber. The database contains information on timber and timber material applications in residential and commercial construction and civil engineering. Per species it indicates whether a timber is supplied with a label for sustainable forest management or legality statement, and whether they meet the Dutch procurement criteria. The database has been compiled by independent Probos Foundation, in cooperation with State Water Authority (*Rijkswaterstaat*), State Building Service (*Rijksgebouwendienst*) and independent Wood Centre (*Centrum Hout*). The database was developed with funding from the Ministry of Spatial Planning and Environment (*VROM*). Centrum Hout and Probos update the database (Centrum Hout, 2012³⁰). During the tender of government procurement, criteria are specified for timber, using adapted STABU specifications. Rijkswaterstaat makes contractors

²⁸ www2.icco.nl/nl/actueel/nieuwsberichten/2110/verduurzaming-van-nederlandse-inkoop-van-hout-in-gevaar

²⁹ <http://www.inkoopduurzaamhout.nl/pdf/120620%20Persbericht%20duurzaam%20hout%20in%20STABU.pdf> (geraadpleegd december 2012).

³⁰ www.houtdatabase.nl

responsible for not delivering any sustainable timber. Research by Milieudefensie in April 2011 and by the Probos Foundation by the end of 2011 shows that in tendering mostly sustainable produced timber is required, but many clients do not actually check whether really sustainably produced timber is delivered or used (Van Benthem and Winterink 2012). The Cabinet stated that control is a shared responsibility of the timber industry and customers (the Dutch public bodies) (IenM, 2011).

In April 2009, a 'Close the Chain' (*Timmer de keten dicht*) project by Foundation Probos, Bouwend Nederland and the former SenterNovem (now AgentschapNL) started. The aim was to increase the share of certified sustainable produced timber used in construction sector. The sector was informed about the usefulness and necessity of certification of sustainable forest management and the supply chain (chain of custody), about what certification means in practice and how it can be achieved (Houtblad, 2012³¹; Probos, 2012³²). In December 2009, VVNH, NBvT, the Union of Waterboards (UvW) and the then Minister of VROM signed a letter of intent regarding sustainable procurement of timber. The Minister and the UvW stated to buy as much sustainable produced timber. Further the UvW declared to encourage the water boards in the Netherlands to use purchasing criteria for sustainable timber, established by the Minister of Environment, as a starting point when purchasing.

The NBvT and VVNH stated that to stimulate their affiliated timber manufacturers in the Netherlands to offer only sustainable timber from certification systems which TPAC has judged that those certification systems are according to the Dutch procurement criteria for sustainable timber. The letter of intent is linked to the Timber Industry Association (VVNH) and NBvT May 2010 Action Plan called "Deliberately Wood" (*'Bewust met hout'*) for wholesalers importing timber to the Netherlands. Timber joinery manufacturers and companies in the Netherlands noted that there false claims circulating about the use of sustainable grown timber. For example, it was claimed that certified timber is difficult to obtain and expensive. The Plan aims to make it easier for entrepreneurs to choose for sustainable timber by removing practical obstacles and to start a promotion campaign.

The Action Plan should stimulate the demand for sustainable produced timber. The Action Plan aims for 50% of hard wood which members of the VVNH import by 2015 to be verifiably sustainably produced. The Action Plan is supported by eight other branch organisations: Algemene Vereniging Inlands Hout, Vereniging van Houtskeletbouwers, Verduurzaamd Hout Nederland, Nederlandse Vereniging van Houtagenten, Vereniging van Importerende Groothandelaren in Hout, Centrale Bond van Meubelfabrikanten and the FOSAG. A Task Force started to inventory opportunities and constraints in the use of sustainable responsible timber in June 2010. These included the closing of the supply chain to sustainable responsible timber. Representatives of the various branches discussed together to what extent their business has already been certified, what activities will be undertaken to encourage and support their businesses and make an inventory of bottlenecks (Bewust met hout, 2012³³). In June 2013 a so called "Green Deal"³⁴ was signed between private and public partners (twenty sector organisations in the wood, construction, furniture and retail chain, two unions, three ministries (Infrastructure and Environment, Economic Affairs and Foreign Affairs), the Sustainable Trade Initiative and Tropenbos International) joined forces to stimulate sustainable forest management through increased demand for sustainable produced timber. The signing was seen by its partners as a success in promoting sustainable forest management by increasing the proportion of wood from sustainably managed forests in the Dutch market, a market based incentive for sustainable forest management worldwide.

³¹ <http://www.houtblad.nl/nieuws/intentieverklaring-duurzaam-inkopen-van-hout-ondertekend.html> (geraadpleegd in december 2012).

³² <http://www.probos.nl/timmerdeketendicht/pdf/houtwereld2009-nr10.pdf> (geraadpleegd in december 2012).

³³ http://www.bewustmethout.nl/actueel/2010-11-27-task_force_bewust_met_hout_weer_bijeen (geraadpleegd december 2012).

³⁴ http://www.bewustmethout.nl/duurzaam_hout/2013-05-23-20_juni-ondertekening_green_deal_bevorderen_duurzaam_bosbeheer

Atsma, the Netherlands Secretary of State, set out advice for "*Sustainable procurement. Eleven recommendations for an ambitious approach to the market*" on 23 June 2011. The Dutch parliament decided in 2012, after two motions, to adopt some of the recommendations. The first motion was the request to Secretary of State Atsma to designate 10 to 12 public procurement pilot projects. Sharing the lessons learned from these projects with the market should encourage others to follow that example. The second motion calls on the government on the basis of the advice to work out a so called 'frontrunner method' and formulate a proposal as to how this can be embedded in current policy and existing regulations. MVO Nederland, De Groene Zaak, NEVI, VNO-NCW and MKB Nederland advocated for an innovative sustainable procurement policy.

5.4.4 Triggers and drivers, opportunities and barriers

Key triggers influencing the innovation of sustainable procurement have been the decision of the government to be a role model and provide leadership, boosting and mandating the timber sector to choose for more sustainable timber. The driver that is maintaining the innovation is the fact that it is a mandatory obligation. This has influenced and effected imports and production; the Ministry of VROM establishing the Procurement criteria. The Ministry of VROM setting up the TPAC. The cooperation between the national government and the Probos Foundation and STABU to formulate specifications; efforts of industry associations to promote sustainable timber such VVNH and NBvT and the Advice Committee to Test Administrative Burdens, ACTAL (*Adviescollege toetsing administratieve lasten*). ACTAL suggested in 2011 that the current government policy for sustainable procurement including timber and timber products is not effective and causes red tape for business, advising a fundamental revision of policy. This provoked many reactions, for instance, Probos Foundation and other parties stated on the contrary that the sustainable procurement policy just works well (Nieuwsbrief d.d. 12 mei 2011 van www.inkoopduurzaamhout.nl).

Biodiversity and ecosystems are included in the procurement criteria under the ecological aspects, with the principle that biodiversity shall be maintained and where possible enhanced. To that end the certification system requires that objects of high ecological value and representative areas of forest types (that occur within the forest management unit) are identified, inventoried and protected³⁵. Another principle is that the regulation function of the forest shall be maintained and where possible enhanced. Therefore the certification system requires that amongst others avoidable damage to the ecosystem is prevented. Concerning the management aspects it is stated that sustainable forest management shall be realized through a management system. To that end the certification system requires that in the forest management plan attention should be given to ecological elements such as ecosystems, species, and functions.

5.4.5 Process dynamics

The following actors take part in the implementation of the Dutch public procurement policy and the emerging innovations: national government, regional government (Provinces), local government (municipalities), regional water authorities, building contractors, timber industry, timber importers, the Association of Dutch Timber Companies (VVNH), Stichting Milieukeur (SMK), TPAC, NGOs (such as Milieudefensie, Greenpeace, ICCO, WWF), AgentschapNL, Stichting Probos, FSC Netherlands, PEFC Netherlands, PIANOo. The ministries, provinces, municipalities and regional water authorities are considered as customers that order to build and decorate governmental buildings (e.g. the Tax Service building in Groningen). The building contractors are ordered by the government to build the governmental buildings. The timber industry (members of the NBvT) supplies timber to the construction firms. And timber companies associated with the VVNH import tropical timber from foreign countries like Indonesia.

³⁵ <http://www.tpac.smk.nl/Public/TPAC%20Assessments%20results/Dutch%20Timber%20Procurement%20Criteria.pdf>

AgentschapNL developed criteria and practical instruments to implement Sustainable Procurement in July 2009 within buying organizations and to incorporate sustainability and social criteria in procurement processes and tendering procedures for 45 product groups.

NGOs such as Milieudedefensie observed critically the compliance of 'the rules' by the timber industry and the government in the Netherlands. In 2006 and early and late 2010 Milieudedefensie investigated the implementation of government's sustainable procurement policy of timber. In the last investigation, the end of 2010, 56 projects of the central government, municipalities, provinces and water boards have been studied by Milieudedefensie. The provinces and the water boards are assumed to achieve the objective of the government for sustainable procurement in 2010. In half of the examined projects 100% sustainable timber has been purchased. The central government and municipalities met respectively 30% and 35% of the projects on the sustainable public procurement policy.

According to Milieudedefensie supportive measures are needed to enhance control and monitoring of the procurement policy. Systematic control by government itself contributes to that. And the necessary knowledge can be obtained by taking the help of organizations such as FSC Netherlands or the Foundation Probos (Milieudedefensie 2011).

The reason that not all the projects of the government use proved sustainable timber, the Secretary of State of I&M blames to the lack of a certificate in the last link of the chain. According to the Minister of I&M compliance with the prescribed contract requirements and closing the supply chain should therefore receive more attention. The implementation and enforcement of the rules are according to the Secretary of State is a shared responsibility of the market (timber supply chain) and client (government). The Secretary of State argued that the market should ensure in prove of sustainability of the applied timber in the project. And the client (the government) should ensure adequate monitoring of compliance of the contractual obligations, taking into account the boundaries of effective supervision (Atsma³⁶, 2011).

According to the Code of Conduct of the Dutch Association for Timber enterprises (*Vereniging van Nederlandse Houtondernemingen*, VVNH), an umbrella organization of 259 wholesale companies representing the timber industry, their members are only allowed to bring timber on the Dutch market that complies with the applicable national and international laws and regulations. Timber companies that fail to comply with the Code of Conduct are confronted with sanctions. The sanction system has three penalties. Firstly a warning if it is a first offense, then a fine of up to € 45,000. Then a suspension and finally a cancellation. If an affiliated timber company does not comply with the code of conduct, then that is submitted to the Binding Advice Commission (*Bindend Advies Commissie*), consisting of independent lawyers and separate from the VVNH (zie www.vvnh.nl).

In 2005, Milieudedefensie filed a complaint against timber company Wijma. The company, according to Milieudedefensie has been guilty of illegal logging in Cameroon (VVNH, Annual Report 2005: 16-17). According to the Binding Advisory Committee it could not be demonstrated that the illegally logged timber was traded in the Netherlands. In addition, an importer was not held responsible for the illegal logging of a Cameroonian supplier (Milieudedefensie, 2007: 2). The Binding Advisory Commission declared the complaint of Milieudedefensie as invalid. Milieudedefensie, Greenpeace, and ICCO stated that the Code of Conduct of the VVNH is no guarantee that only legal timber will be traded because the code is based on a legality statement signed by suppliers. According to the three NGOs no independent control takes place concerning the liability of the statement. Furthermore the three NGOs stated that hardly enforcement occurs in case of violation of the Code of Conduct (Milieudedefensie³⁷, 2007).

³⁶ Brief van staatssecretaris IenM J. Atsma en minister van BiZa J.P.H. Donner d.d. 5 juli 2011 aan de Voorzitter van de Tweede Kamer betreft de beantwoording van Kamervragen van GroenLinks over inkoop duurzaam hout.

³⁷ Milieudedefensie (2007), Factsheet Effectiviteit vrijwillige maatregelen. Milieudedefensie, ICCO en Greenpeace.

In 2010, five NGOs (Greenpeace, ICCO, Milieudefensie, the Dutch Centre for Indigenous People (*Nederlands Centrum voor Inheemse Volken*, NCIV) and WWF) objected against the decision of the TPAC that PEFC International is sufficiently sustainable and could be included as one of the certified schemes under the Dutch procurement policy. The organizations stated that PEFC International shows serious shortage concerning the protection of the rights of indigenous peoples and nature, has no measures to protect endangered plants and animals, no prohibition on the conversion of forest plantations and provides insufficient guarantees to ensure proportional representation of NGOs and groups of indigenous peoples.

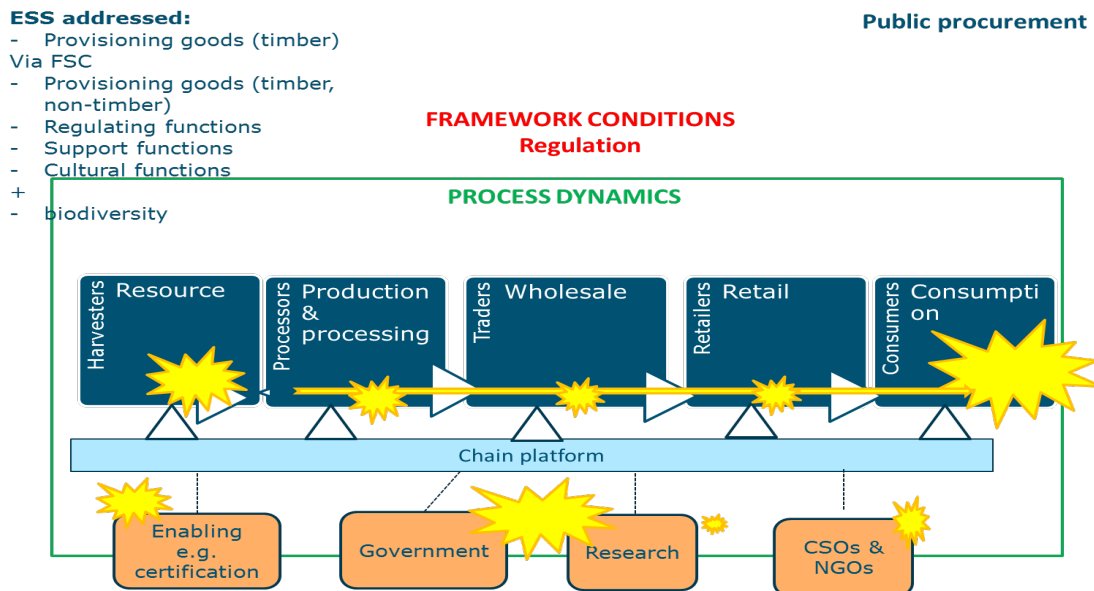


Figure 10 Dutch procurement policy FSC and innovation in the international tropical timber value chain

5.4.6 Learning processes

There have been significant lessons learnt around the process. Most has been informal and unstructured as different actors have sought to test, review and improve the process to meet their members or organizations objectives. NGOs disagreeing with the formal assessment procedures and the resulting decision of the Secretary of State to the advice of the TPAC have "forced" learning, by going using both formal channels and the courts to confront and test the decisions made by the TPAC and Secretary of State. Other options include the numerous studies and investigations, for example those conducted by NGOs (Milieudefensie). These have led to the government to acknowledge that the sustainable procurement criteria are not finalised by setting requirements but need to continue with inspection and control of actual delivery and use of sustainable produced timber. The organisations involved in setting criteria have also generated learning and shared experiences, as have the business associations which have committed themselves to increase sustainable sourcing, arguably at least partially stimulated by the government's actions. Governments of foreign countries and national politicians have also played a role in the assessment of certification systems, such as the Malaysian MTCS.

5.4.7 Conclusions

1. Most of the innovations introduced by sustainable procurement requirements in the Netherlands are institutional innovations. The setting of requirements for sustainably produced timber in the form of statements of work is a technical innovation. These innovations have occurred as a result of the willingness of actors in the timber chain in the Netherlands and the Dutch government and ministries to cooperate, with NGOs playing a watch-dog role.

2. Ecosystem services are only indirectly addressed in sustainable procurement criteria. As different certification schemes are seen as acceptable ways of meeting the procurement criteria, where FSC is used as the certification scheme, ecosystem services are more explicitly addressed. However for PEFC, ecosystem services are not specific or explicit in the general standards and also differ from country to country.
3. TPAC has determined which certification systems can be used to legitimate sustainably procured timber for sale to government authorities in the Netherlands. Currently two certification systems (FSC and PEFC) are allowed. It thus acts as both a barrier to market entry and an opportunity. This also restricts the amount of timber that can meet the procurement criteria, the influence and scale which the government exert to further integrate ecosystem services in its timber procurement.
4. As the development and implementation of the sustainable procurement policy has progressed, it has become clearer that the focus needs to shift towards changing actual behaviour and actions of Dutch timber companies and their supply chain, which are not yet included in any type of chain of custody certification.
5. The innovation focuses specifically on one group of consumers, different government bodies. This means that the large private sector business to business and consumer market is not obliged to use sustainably produced timber. This demand is also strongly affected by supply, consumer awareness, and the competition between sustainably produced and certified timber with generally lower priced non-sustainable or uncertified produced timber.
6. Whether the assessment procedure of the TPAC will result in more political interest and therefore political involvement? And what comes next when the policy objections set by the Dutch government for all public bodies have been realized?
7. Actors in the chains have indicated that monitoring and inspection of whether sustainably produced timber is actually sustainably produced is required. This would also be a way of verifying the extent to which ecosystem services are addressed in practice by the sustainable procurement requirements.

5.5 REDD+ in Indonesia

5.5.1 Background

The major proportion of tropical timber imports by the Netherlands originates from Malaysia, Indonesia and Brazil. The Netherlands is also an important entry point for tropical timber to the EU. 30% of the total timber export of Malaysia entered the EU via the Netherlands. The second importing EU country is the UK with 28%. As for Indonesia the major destinations in the EU are Germany and the Netherlands, with a share of 22% respectively 21% (Kamphuis *et al.*, 2010). Indonesia hosts the third largest tropical rain forest in the world, with forests covering 52 per cent of the country and, from 1990 to 2000 had some of the highest degradation and deforestation rates globally (-1.7%, from 2000 to 2010 -0.5%)(FAO 2011).

5.5.2 The innovation relating to ecosystems services

Deforestation accounts for approximately 20 per cent of world annual greenhouse gas emissions and is the largest source of emissions in the developing world. The basic premise of REDD+ is simple: rich nations pay tropical countries to preserve their forests by compensating for deforestation and degradation. The concept is not new. Compensating tropical forest conservation was proposed in the 1980s and 1990s but wasn't until the latter half of the 1990s that the idea gained much currency at an international level, when it was discussed at various United Nations Framework Convention on Climate Change (UNFCCC) events, including COP3 in Kyoto in 1997. Nevertheless technical concerns and opposition from environmental groups (led by WWF) resulted in forest conservation being excluded from the Kyoto Protocol by 2001. The concept of 'avoided deforestation' re-emerged on the international stage in 2005 with the formation of the Coalition for Rainforest Nations (CfRN), a

group of tropical countries lobbying for the inclusion of forest conservation as a way to mitigate to climate change. Led by Papua New Guinea and Costa Rica, the Coalition for Rainforest Nations presented a draft proposal "Reducing emissions from deforestation in developing countries: approaches to stimulate action" at COP11 in Montreal in 2005. The need to include measures to reduce emissions from forest deforestation and degradation in developing countries in any new international agreement on climate change was recognised by parties at the 13th climate change conference (United Nations Framework Convention on Climate Change Conference of the Parties (UNFCCC COP 13) in Bali in December 2007. This represented the culmination of two years of negotiations and technical advancements and resulted in the Bali Action Plan, which called for "policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests and enhancement of forest carbon stock in developing countries."

Support for REDD+ has deepened and broadened since Bali: REDD+ was one of the only areas of progress during climate talks in Copenhagen in December 2009. The reasons for the stagnation are myriad, but despite the simplicity of the idea, implementing REDD+ is extraordinarily complex. Although an agreement on REDD+ has still not been signed, projects are already underway in a number of countries and industrialized countries have committed billions of dollars to REDD+ start-up initiatives via the UN-REDD+ Program, the World Bank's Forest Carbon Partnership Facility, and other entities. Today a number of countries have REDD+ projects, some of which are even generating carbon credits in voluntary markets. By supporting credibly certified projects, companies and individuals can claim to 'offset' their emissions by keeping forests standing. Once an agreement is finalized, 2013 is the earliest REDD+ would formally commence, following the expiration of the Kyoto Protocol. Despite recent commitment to push forward with REDD+ at the 2012 COP17 summit in Durban, REDD+ pilot projects are facing difficulties getting off the ground.

The last few years have provided lessons by testing what does and doesn't work in terms of pilot projects. The links between REDD+ and the sustainable timber production could increase carbon stocks needed to reduce greenhouse gas emissions that contribute to global warming. Sustainable timber production in forest concessions has helped limit deforestation. However, the contribution of different types of sustainable forest management practices and how they can increase overall carbon stocks and contribute to reduce greenhouse gas emissions is not yet well understood. Once understood, they can be used to improve existing projects that reduce emissions from deforestation and degradation, such as REDD. For example, the main tropical forest areas in the Amazon, Asia and the Congo Basin are all under increasing threat from deforestation caused by the boom in trade for timber and non-timber forest products.

Without regulations to protect the carbon locked in its forests, those countries signed up to REDD+ could lose their share in the USD\$1.25 trillion expected from compensation payments. A secondary issue is whether the standards set by forest certification schemes could be compatible with REDD+ standards and safeguards. These could help improve the design and management of REDD+ pilot programs, ease the conflicts between all actors involved in sustainable timber production; from large investors to small scale producers, and ensure that everyone has a voice in REDD+ and that everyone benefits from the compensation for increased carbon stocks. It may be too early to integrate sustainable timber forest management practices with REDD+, especially as international standards had not been set, and REDD+ is still a national, voluntary project.

Two initiatives are particularly pertinent to support the development of national REDD+ systems: the World Bank's Forest Carbon Partnership Facility (FCPF) and the UN Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD).

The FCPF was launched in 2007 in Bali. Eighteen countries have pledged a total of 457 million dollars to the FCPF. The World Bank acts as a trustee for two funds under the FCPF (REDD+

Monitor³⁸, 2012), the Readiness Fund with 239 million US\$ pledged of a target of 300 million dollars and through which 36 countries are preparing themselves to participate in a future, large-scale system of positive incentives for REDD. The FCPF has provided 3.6 million dollar in funding to date for Indonesia and UN-REDD+ have provided 5.6 million US\$. Other bilateral funding to Indonesia includes more than 100 million dollar from Australia and the German Government's International Climate Initiative, committed part of its global 92.6 million dollar in REDD+ funding to Indonesia (The REDD+ Desk³⁹, 2012). The World Bank had produced a roadmap for countries to develop REDD+ readiness strategies. The FCPF has supported 24 of 36 country members with their readiness strategies. The Netherlands was one of the first countries to support the FCPF (Ministry of Foreign Affairs, 2010). By 2012 the Netherlands had donated 20.3 million US\$ FCPF Readiness Fund (IEG, 2012: 4).

The UN-REDD+ National Program aims to facilitate the development of a REDD+ architecture in Indonesia that will allow a fair, equitable and transparent REDD+ implementation, significantly contributing to a sustainable reduction in forest-related GHGs. In March 2009, 5.6 million dollar was approved by the UN-REDD+ Program Policy Board for the Indonesia National Program.

5.5.3 Detailed innovation history

The Indonesian government's commitment to REDD+ was elaborated in a statement by President Susilo Bambang Yudhoyono in 2010, declaring that Indonesia would reduce its greenhouse gas (GHG) emissions by 26% of 'business as usual' emission levels by 2020 through self-funding, or by 41% with international help. The Government has taken steps to implement REDD+ activities, including working with a number of partners in various fields and institutions. One of these partners is the Government of Norway, with which Indonesia has signed a Letter of Intent to develop demonstration activities, a National Action Plan on Greenhouse Gases, and a National REDD+ Strategy (Indrarto *et al.*, 2012: 14). Indonesia is one of the seven most advanced countries with REDD+ implementation (Independent Evaluation Group 2012), although it is not clear whether it can be considered as REDD+ ready and its REDD+ program has been held up by numerous factors, with corruption seen as a major challenge⁴⁰. There are more than 60 REDD+ activities active or in the preparation phase. These activities range from support of REDD+ policy development at the national level to large-scale provincial demonstration projects and local capacity building efforts (The REDD+ Desk, 2012).

The Netherlands joined the REDD+ Partnership, launched at the Oslo Climate and Forest Conference in May 2010. The REDD+ Partnership is an interim platform for its partner countries to scale up actions and finance for initiatives to reduce emissions from deforestation and forest degradation (REDD+) in developing countries. In August 2012 the REDD+ Partnership had 75 country members. In the Netherlands, REDD+ platform meetings are jointly organized by the Ministry of Economic Affairs, Agriculture and Innovation, the Ministry of Foreign Affairs, WWF the Netherlands and Tropenbos International, and Centre for Development Innovation (CDI) of Wageningen University. The objectives of these meetings are to i) share experience and exchange of information, ii) present non-governmental initiatives related to REDD+ and explore the relation with the international REDD+ discussion, and iii) explore interest from companies and local governments (municipalities and provinces) in the development of REDD+ like systems. Dutch climate change and development policy aims to ensure that links between climate change and development are well researched and clearly articulated. It enables the Netherlands to assist countries in developing the REDD+ mechanism to protect the carbon stocks in forests. The focus of Dutch policy has gradually shifted from support for

³⁸ Source: <http://www.redd-monitor.org/2012/11/22/independent-evaluation-group-review-of-the-fcpf-world-bank-needs-a-high-level-strategic-discussion-on-its-overall-approach-to-redd/>

³⁹ Source: http://www.theredddesk.org/countries/indonesia/readiness_overview#activities. The REDD Desk is a collaborative platform for REDD and REDD Readiness, initiated by the Global Canopy Program and the Forum on Readiness for REDD, represented by the Brazilian-based Amazon Environmental Research Institute (IPAM).

⁴⁰ <http://news.mongabay.com/2013/0411-dharsono-interview-katingan.html>

conservation to sustainable forest management (Ministry of Foreign Affairs, 2010). In the 2010-2012 period Dutch Overseas Development Aid budget earmarked EUR 195 million for REDD+.

5.5.4 Triggers and drivers, opportunities and barriers

The UN-REDD+ Program in Indonesia has been a driver in REDD+ nationally. It has established consultation processes that involve different stakeholders, including indigenous peoples and local communities, taking into account of gender and religious values. The Program works at national, province, district, and community levels and has developed these two consultation frameworks, multi-stakeholder (public) consultations where consensus by all stakeholders (government, NGOs, CSOs/local communities, Indigenous Peoples' representatives, private sector, universities, and experts) is sought to produce public policy related outputs and a consultation process to the community located at selected districts through the implementation of FPIC. These consultation concepts are disseminated to all stakeholders at various UN-REDD+ events to let the public fully understand how UN-REDD+ Indonesia operate (UN-REDD+ Program, 2012: 20⁴¹).

Opportunities include the use of REDD+ to paying for reducing deforestation. REDD+ is not directed at stopping the use of forests for timber and also to halt planned conversion of forests to other economic uses. REDD+ is a mechanism that uses financial incentives to reward developing countries with large forest area as well as with high deforestation rates that reduce their emission of greenhouse gases from deforestation and forest degradation. Countries that demonstrate verifiable reductions in deforestation, or maintenance of forest cover, are paid compensation through a global or regional fund or are allowed to sell carbon credits that permit additional emissions elsewhere (Melissa 2010: 19). Another opportunity is that REDD+ goes beyond avoiding deforestation and degradation and includes conservation, sustainable management of forests (SMF) and enhancement of forest carbon stocks (REDD+). The "+" sign indicates there that climate benefits are possible not only from avoiding negative changes (deforestation, degradation) but also from enhancing positive changes which referred to forest regeneration and rehabilitation, negative degradation, negative emissions, carbon uptake, carbon removal or just removals. In some versions REDD+ will also include peat lands. REDD+ became official language at the 2008 COP14 in Poznan (Melissa 2010). The scope for REDD+ was set out at the UNFCCC 15th Conference of Parties (COP15) in Copenhagen in December 2009.

REDD+ foresees four types of co-benefits. Forest conservation provides ecosystem services such as maintaining water levels and quantity, protecting soil from erosion (Stickler *et al.*, 2009; Union, 2010). Secondly, forest conservation through REDD+ actions is expected to have economic benefits such as reducing poverty, supporting livelihoods and stimulating economic development. Thirdly, political change toward better governance, less corruption and more respect for the rights of vulnerable groups is expected. And fourth, REDD+ can boost the capacity of both forests and human to adapt to climate change (Melissa, 2010: 20).

Four elements play an important role in the opportunities to enhance ecosystem services as part of the implementation a REDD+ process:

- *Reference levels*: the level against which the impacts of REDD+ policies and measures are assessed to determine whether a participating country have reduced emissions and should receive financial rewards.
- *Implementation scale*: that can be national-based or project-based. National based implementation requires the national government to develop a national carbon accounting system and a national management system to implement REDD+ projects and to distribute revenue generated to relevant stakeholders within the country. And project based implementation allows buyers to interact directly with an independent entity verifying the credit generation. Most of the proposals of REDD+ mechanism support the national based approach for the implementation of REDD+.

⁴¹ UN-REDD Program, 2012. Indonesia National Program Semi-Annual Report, 30 June 2012.

- *Financing options:* Currently REDD+ is financed through fund-based approaches which may not be sustainable. Over time these are expected to shift towards market-based system or hybrids.
- *Phasing:* there are three successive phases according to which a REDD+ mechanism is implemented to ensure an effective and result based mechanism, namely: planning, actual implementation and payment for reduction. In the planning phase a national forest carbon strategy is developed (REDD+ readiness), including national dialogue and local stakeholder consultation, strengthening institutions, technical, and human capacity, designing a measurement assessment reporting and verification (MRV) system and forest carbon accounting, developing a reference emission level (REL), and demonstration activities. These demonstration activities or projects are mostly funded through voluntary contributions by the World Bank's FCPF, UN-REDD+ program and other bilateral agreements. In the actual implementation phase, policies and measures proposed in the national strategy are implemented, using sustained funding from a global facility supported by binding financial commitments from developed countries. The use of these funds by developing countries is based on demonstrated commitment and continued performance assessed using indicators of emission reductions. In the phase of payment for reduction, paying is based on the forest emission reductions (Melissa, 2010: 23).

A further opportunity is that REDD+ is seen as being able to contribute to restrain illegal logging activities by financial incentives that encourage compliance with the law, changes in behaviour and wider governance reforms in Indonesia. But the REDD+ financing by funding requires attention to credibility, traceability, social and governance safeguards and independent verification of all activities (Indrarto *et al.*, 2012: 115).

The institutional, political and economic environment within which REDD+ is being implemented in Indonesia has presented a challenge in the period 2007-2011 (Indrarto *et al.*, 2012). Barriers include that as REDD+ introduces new values and forest products (i.e. carbon) – and hence another layer of additional claims to land by various groups of actors – it is necessary to clarify land tenure and legal frameworks to improve land use planning (Indrarto *et al.*, 2012: 12). Secondly, during the implementation of REDD+ projects the rights of forest-dependent communities and vulnerable groups need to be protected. Thirdly, recently established cross-sectoral coordinating structures and institutions should become effective and encounter less resistance from sectoral ministries. A fourth barrier is the continued transfer of the authority for natural resource management to the regions (decentralization process) and that local regulations needs to fit with higher-level policies and laws (Indrarto *et al.*, 2012: 13).

5.5.5 Process dynamics

REDD+ actors in Indonesia can be grouped into four main categories: government, communities living in and around forest areas, NGOs and the private sector. Each group plays its own role in the REDD+ activities. Although the government's position on REDD+ policy is dominated by the forestry sector, other sectors, such as agriculture, also play important roles, particularly with regard to estate crop expansion and peat land management outside forest areas. Regional and central governments have different knowledge capacity. Although the central government generally has a better understanding than regional governments, the situation should not be generalized because each region has a different level of knowledge (Indrarto *et al.*, 2012: 61).

The involvement of the communities living in and around the forests remains weak in the context of forest management because of a weak legal foundation for promoting community use rights. Communities' knowledge of REDD+ varies. For example, communities assisted by certain NGOs have a better understanding than those that have not received such assistance. Most forest communities still have no understanding of various issues relating to REDD+ (Indrarto *et al.*, 2012: 61).

The position of each NGO differs. Organizations that will benefit from REDD+ tend to take the same position as the government. These organizations tend to be confident that REDD+ will succeed, and

offer suggestions for improvement to support this success. Other organizations tend to be critical and question the capacity of REDD+ to resolve the problem of climate change. NGOs tend to have adequate knowledge, although this should not be generalized as some organizations may view REDD+ as their main focus. Some NGOs may come to advise the government on policy. Although REDD+ is a new concept, NGOs have the necessary knowledge and information to describe REDD+ relatively clearly. The government sometimes uses, as a reference, information on REDD+ supplied by NGOs. Some NGOs (e.g. FFI, TNC and WWF) have become government partners in policymaking. With the information they have, some NGOs (e.g. Walhi, AMAN and HuMa) criticize government policy on REDD+ (Indrarto *et al.*, 2012: 61).

The private sector has several roles. They act as project developers and beneficiaries of carbon credits, and as traders/brokers or proponents of REDD+ activities. The broker role in REDD+ is foreseen to be considerable, particularly when REDD+ opportunities open at the regional/local level. The proponent role will be substantial in implementing future REDD+ offset schemes. Private actors have an interest, as both brokers and proponents, in maximizing REDD+ opportunities in addressing climate change through carbon credits. Private actors have a good understanding of REDD+. Those directly involved in REDD+ projects are involved in REDD+ discussions and policy processes. As REDD+ will have a positive impact on the private sector, appropriate knowledge and information will benefit companies. The interest of the private sector is to derive profits from selling carbon credits (Indrarto *et al.*, 2012: 62).

Stakeholder consultation and communication in Indonesia to date (see REDD+ Readiness Progress, October 2012) includes:

- Consultations on developing the REDD+ National Strategy at national level with civil society and other stakeholders, led by the leadership of Bappenas and the Ministry of Forestry, under the umbrella of the UKP4 (Presidential task force for REDD+ in Indonesia) and Ministry of Forestry.
- Consultations focused on the Indonesian REDD+ Strategy, on the identification of the first REDD+ Demonstration Activities (Central Kalimantan), on the national institutional arrangements for REDD+ implementation and on REDD+ safeguards.
- The FCPF national consultations on the Strategic Environmental and Social Assessment of REDD+ Strategy options and by consulting on the Management Framework for sub-national implementation. The SESA builds on activities undertaken by the Government and CSOs.
- FCPF coordination meeting with all stakeholders, including UKP4, Bappenas and Ministry of Finance to receive comments on priority activities and to be in line with the national readiness efforts and with the REDD+ Strategy and RAN GRKDKN has produced Public Consultation Guideline to reduce the confusion between socialization versus consultation.

REDD+ is implemented at a national and sub-national province, district and management unit level, shown in Table 6 REDD+ strategy for the readiness phase (2009-2012) in Indonesia.

The development of REDD+ demonstration activities is considered as learning by doing and as a means of building commitment and synergy between stakeholders. Local and international NGOs are working closely with donors to develop a wide range of REDD+ pilot projects. WWF is one of the most important partners in the Heart of Borneo Initiative, collaboration between governmental and non-governmental stakeholders with the aim of conserving the rich forested core of the island of Borneo. FFI also support several activities in this area, including a REDD+ project to reduce emissions from conversion of forest land to oil palm plantations. In general, a high concentration of projects occurs in the peatlands of Kalimantan and Sumatra, as efforts to curb deforestation and protect Indonesia's high level of biodiversity go hand in hand (The REDD+ Desk, 2012). As of March 2010, nine REDD+ demonstration activities were on-going in Indonesia, shown in Table 7.

Table 6 REDD+ strategy for the readiness phase (2009-2012) in Indonesia. Source: Melissa, 2010, p. 72.

Level	Strategy approach
National approach	<ol style="list-style-type: none"> 1. Policy intervention to tackle drivers of deforestation and forest degradation in different landscapes of forested areas. 2. REDD+ regulations: guidelines, REDD+ commission, ministerial regulation on REDD. 3. Methodology: establishment of national reference emission level and a MRV system. Funded by FCPF, UN-REDD, bilateral (Australia). 4. Institutional arrangements: financing, including distribution of incentives and responsibilities, national registry, capacity building, stakeholders communication and coordination among REDD+ institutions, stakeholders consultation 5. Analytical works: REL, MRV, co-benefits, risks. Funded by the Government of Indonesia and FCPF
Provincial implementation	<ol style="list-style-type: none"> 1. Methodology: establishment of provincial reference emission level and a MRV system. 2. Institutional: capacity building, stakeholders' communication and coordination among REDD+ institutions, stakeholders' consultation. 3. Demonstration activities, voluntary carbon projects.
District	<ol style="list-style-type: none"> 1. Methodology: establishment of district reference emission level and a MRV system. 2. Institutional: capacity building, stakeholders' communication and coordination among REDD+ institutions, stakeholders' consultation. 3. Demonstration activities funded by Government of Indonesia, bilateral (Germany), The Nature Conservancy, World Wildlife Fund, the International Tropical Timber Organization, Korea, UN-REDD, and voluntary carbon projects.

Table 7 REDD+ demonstration activities in Indonesia. Source: Melissa, 2010, p. 74.

Project name	Location	Institutions involved
Merang REDD+ Pilot Project	Musi Banyuasin, South Sumatra	GTZ
Sumatra Forest Carbon Partnership	Jambi, South Sumatra	Australian Government
Meru Betiri National Park	East Java	International Tropical Timber Organization, Forest Research and Development Agency
KOICA REDD+ Project in Lombok	Lombok	KOICA
Kalimantan Forest and Climate Partnership (KFCP)	Central Kalimantan	Australian Government partnering with the Government of Indonesia. Implementation partners are CARE, BOS, Wetlands International
Berau Indonesia Climate Action Project; Berau Forest Carbon Program	East Kalimantan	The Nature Conservancy, ICRAF, Sekala, University of Mulawarman, Winrock International, University of Queensland.
REDD+ Projects by FORCLIME in Kapuas Hulu	Kapuas Hulu, Kalimantan	German DC Agencies, DED, CIM, Inwent. Implementation by WWF and Eco Consult.
Malinau Avoided Deforestation Project	Malinau, East Kalimantan	GER/PT. Inhutani II, Malinau Regency, KfW, FFI, District Government, GTZ, Tropenbos International, Global Eco Rescue, Borneo Tropical Rainforest Foundation.
UN-REDD+ Carbon Project	Central Sulawesi	FAO, UNDP, UNEP and the Indonesian Ministry of Forestry

In December 2010 Central Kalimantan was selected as a pilot province to carry out pilot testing an initial REDD+ as part of the agreement (Letter of Intent) with the Norwegian government. In 2011 a second province-wide pilot was selected as part of that agreement. The Central Kalimantan site is used to test strategies and approaches including processes for granting and managing forest concessions, reducing corruption in the bureaucracy, and ensuring that benefits generated from forest conservation reach local communities. Besides the above mentioned demonstration projects there are also voluntary pilot REDD+ initiatives in the early stages of design and implementation.

5.5.6 Learning processes

Adoption of REDD+ requires a long time, because to understand it well, people must also understand emissions and climate change. The expectation is that by observing the direct economic and environmental benefits of REDD+ demonstration activities, local communities will voluntarily refrain from utilizing economic practices that destroy their environment (Kristanty, 2011).

REDD+ demonstration activities are important in the REDD+ learning process to ensure the regulatory framework, socialization and procedures can be successfully implemented on the ground (Kristanty, 2011).

Communication between the central and sub-national governments on REDD+ has been undertaken mostly through formal medium (public consultation, workshops, symposiums, and seminars). The communication on REDD-plus between national and sub-national levels of governments has been insufficient, which was partly caused by unsynchronized and incomplete instructions/guidance from the national authorities (Scheyvens, 2010; Independent Evaluation Group, 2012).

Governance is one of the most decisive factors in success. Governance gaps and a lack of coordination remain with sectoral differences between government institutions leading to different understandings of REDD+, because of the different interests of each sector (e.g. public works, agriculture, energy and mineral resources) (Indrarto *et al.*, 2012).

Community involvement is important for the success of REDD+. A project will not be successful without ensuring any affected communities' proper agreement on and clear understanding of REDD+ issues (Indrarto *et al.*, 2012: 61).

5.5.7 Conclusions

1. Understanding REDD+ has been complicated by the fact that the mechanism is still evolving and that many of the 60 or so current pilot projects in Indonesia are using different methodologies and approaches.
2. Adoption of REDD+ requires a long time because to understand it well, people must also understand emissions and climate change (Kristanty, 2011).
Although REDD+ policies are now in place in Indonesia, it is still too early to determine REDD's coherence with biodiversity and with ecosystem services. Although existing REDD+ scheme and CBD regulations in Indonesia are connected, the links between these with ecosystem services are not coherent. REDD+ policies and projects regulate forest areas for a certain period as carbon storage and absorption areas. During the contract period with REDD, forests should not be exploited for timber and biodiversity should be well-maintained. However it is not clear how likely it is that this will happen consistently across Indonesia in reality. As the Indonesian REDD+ regulations include production forests and Sustainable Forest Management, REDD+ finance could be channelled to logging operations, meaning that REDD+ and the CBD could come into conflict in Indonesia (Global Forest Coalition, 2009).
3. Indonesia faces several challenges in developing its REDD+ strategy. The REDD+ regulatory framework now needs to be tested by the projects currently underway and regulation needs to be elaborated through decrees and guidelines etc. based on good science and meaningful

consultation and an inter-ministerial collaboration to address the consequences for other sectors needs to be organized.

4. The links between REDD+ and the sustainable timber production are still unclear and unproved. On one hand REDD+ could increase carbon stocks and contribute to reduce greenhouse gas emissions, and sustainable timber production can help limit deforestation. The contribution of different types of sustainable forest management practices and how they can increase overall carbon stocks and contribute to reduce greenhouse gas emissions is not yet well understood. The standards set by forest certification schemes to be compatible with REDD+ standards and safeguards could help improve the design and management of REDD+ pilot programs, ease the conflicts between all actors involved in sustainable timber production and ensure that everyone has a voice in REDD+ and benefits from compensation for increased carbon stocks, however these need to be well integrated and standards on an international and national level developed and set. An issue is how to ensure that carbon credits are linked to the product (forest) and local forest-based communities and users also obtain their (legitimate) share of benefits.
5. REDD focuses on one ecosystem service - could be a business opportunity for companies and those managing forests, providing a sustainable basis for forest management that considers ecosystem services.
6. The role of the Dutch government and actors at multiple levels, and emphasis on multi-stakeholder consensus and involvement, gives the Dutch government some leverage to address raise and address issues to enhance ecosystem services in REDD+ and in integrating REDD+ with sustainable forest management, particularly timber certification.

6 Key findings and governance options for sustainable use and maintenance of ecosystem services

6.1 Introduction

This study explores the governance options available for the Dutch government to integrate the sustainable use and maintenance of ecosystem services in the tropical timber value chain with Dutch links and give ecosystem services a more explicit place in the mechanisms used to govern the chain. The rationale behind this objective was to distinguish whether there are 'wins' to be gained for chain sustainability by acknowledging and improving the integration of ecosystem services. The choices of the trade-offs and balances between different goods and services, ecosystem functions and impacts on biodiversity across time and space can be implemented through a range of mechanisms such as planning, policies and regulations, institutions, markets and payments. It is these types of mechanisms that the tropical timber value chain innovation cases in this study sought to investigate.

The discourse analysis (presented in Chapter 3) shows that Dutch policies dealing with sustainable chains and governance do not define ecosystem services: it is used as a vague, container term. Ecosystem services are referred to as the economic use of natural resources and biodiversity, couched in terms of economic value, with a strong belief that market mechanisms are sufficient to ensure the sustainable use and maintenance of ecosystem services. Biodiversity is presented as "valuable" and frequently associated with conservation, with new market-based initiatives and financial instruments used to maintain biodiversity. The Dutch sustainability agenda emphasises Dutch competitiveness and is strongly internationally driven. Business partners are stimulated to lead initiatives, with the government adopting a facilitating, stimulating and supporting role – creating space for enterprises to take sustainability initiatives and develop innovations. It is within this current framework that the governance options used and available to the Dutch government were examined.

In this last chapter the four tropical timber value chain innovation cases⁴², presented in Chapter 5, are analysed and compared with the goal of obtaining more insight into the interactions between these processes, the framework conditions in which the tropical timber value chain is embedded and the lessons that can be learned. These lessons learned focus on the sustainable use and maintenance of ecosystem services from an innovation system approach, and the potential leverage points for government interventions. This enables recommendations to be made for the Dutch government in terms of possible governance options. These recommendations are included in Section 6.3.

6.2 The tropical timber chain innovation cases revisited

As explained in Chapter 2 on the methods and concepts, the integration of ecosystem services into approaches aimed at increasing the sustainability of international value chains, such as certification is relatively recent. This section briefly characterises the four tropical timber chain innovation cases in terms of how ecosystem services are addressed, how the stakeholders participate in the innovation processes and the role and policy instruments used by the Dutch government. The section concludes with a summary of the challenges to integrating ecosystem services in the international timber value chain.

⁴² The four tropical timber value chain innovation cases: Forest Stewardship Council certification (FSC); Initiative for Sustainable Trade and the Sustainable Trade Action Plan (IDH-STAP); Dutch public procurement policy for timber and timber products; and Reducing Emissions from Deforestation and Forest Degradation (REDD+).

Innovation bundles

The four cases illustrate the different dimensions of innovation: technical, organizational and institutional, and how such dimensions are interwoven. Innovation in response to the complex challenge of increasing the sustainability of international value chains can be characterized as 'bundles of innovation', referring to different types of innovation happening at the same time. The IDH-STAP case bundles different organizational innovations and has the potential to develop into an institutional innovation, due to changes in the Dutch international cooperation policy towards sustainable inclusive development. The IDH-STAP focuses on bringing Dutch and international chain actors together to make international value chains more sustainable through a new way of financing value chain sustainability initiatives, with 1:1 matching of private sector investment. The public procurement case demonstrates both technical and institutional innovations, with new procurement criteria for sustainable timber for example, which are a mandatory requirement for public procurement, such as in the construction of public housing and infrastructure.

Innovation in the REDD+ case concerns new financing options to support sustainable forest management by making the value of forest ecosystems and their products and services more explicit. It has both an organizational and institutional character. The FSC case is central to both the IDH and public procurement cases, as FSC is the main certification scheme promoted by the Dutch government and executing agencies such as IDH, to meet sustainability criteria and goals. The FSC certification standard addresses, explicitly and implicitly, all ecosystem services and products. It has a significant influence in driving organizational and institutional change in the tropical timber value chain, affecting the way forests are used and managed and, at the end of the chain, how consumers perceive and value tropical timber products.

Ecosystem services implicitly addressed

The cases highlight that ecosystem services have been considered mainly as one element in value chain sustainability and up to now, have not been made explicit in these innovations. The exception is a new FSC standard. FSC and public and private sector partners are working on a certification scheme for ecosystem services (ForCES) that aims to make them more explicit by developing bundles of certified ecosystem services (such as carbon, watershed services, high biodiversity values, cultural goods) and creating a market for them. Support for specific ecosystem services certification as an innovative product, appears interesting for timber concession owners as it diversifies the products obtained from concessions and could create additional revenue streams, whilst having positive environmental and social benefits at the same time. FSC and partners indicated that initial responses from market analysis shows that there is a demand and appetite for ecosystem services certification. ForCES is innovative as it is the only certification scheme looking at multiple ecosystem products and services.

Other schemes (e.g. for carbon) concern just one ecosystem service. The project has a strong learning element, being iterative and building on the results of regular meetings and progress evaluations which guide the further development of valuing and certifying ecosystem services. Specific challenges facing ForCES are the need to develop capacity and skills (to measure, value and monitor services, certify and trade them) and create understanding about an innovative product and market at the same time. Although in a pilot phase ForCES is expected to stimulate further innovations in the tropical timber value chain, by bundling, commoditizing and creating a tradable market for ecosystem services.

IDH aims to transform markets towards sustainable production and consumption, seeking to deliver impacts that contribute towards the millennium development goals, thereby supporting the international development agenda. The IDH-STAP case illustrates an innovation that brings together public, private and civil society partners with a deliberate fostering of market based development, partnership and learning. IDH focus on FSC certification as the way to achieve sustainable timber imports to the Netherlands and Europe. There is no major discourse on ecosystem services however – all ecosystem services in the IDH activities are implicit. There is a general focus on sustainability, in

which biodiversity is explicit, but not (all) aspects of ecosystem services are explicit. Although the IDH has a strong learning and evaluation element in its operations, it does not look at ecosystem services specifically so little can be learnt from the innovation in this respect. The Dutch public procurement system uses criteria developed by an assessment committee, based on international guidelines. These only indirectly mention or encourage ecosystem services. Similarly, the REDD+ case largely concerns one type of ecosystem service (carbon) and only implicitly mentions other ecosystem services.

Community and consumer organisations are missing actors in the chain

Table 8 provides an overview of the actors involved in the four cases of innovation in the international tropical timber value chain. This multi-stakeholder involvement is generally considered as critical to the success of innovation. However the presence or absence of certain groups of chain actors is notable, particularly the extents to which consumers (private, corporate or public) are actively included in developing the innovation. Consumers tend not to have driven the innovation but have rather been stimulated or been made aware of the need to address and integrate one or more ecosystem services in the chain ex-ante (FSC, ForCES, IDH).

The FSC and ForCES involve private companies and NGOs and provide a long running example of a multiple stakeholder process. Their roles have been to jointly develop and implement the FSC standards, criteria and certification. Additional stakeholders have been involved in implementing the pilot ForCES project, bringing in the perspectives of national government research institutes and development organisation. Notable by their absence however are consumers - whether of (certified) timber or ecosystem services. As FSC and ForCES are market led innovations, engaging the consumer (individuals, business and public sector) to create a need and willingness to buy ecosystem services (directly in the form of ecosystem services certification or indirectly through FSC certification), individually or in bundles, appears essential. This raises questions currently being tackled by certification and sustainability initiatives⁴³. For example to what extent, do consumers want to know about ecosystem services and whether they are 'sustainable'? And to what extent does the credibility of these initiatives (e.g. reporting and monitoring) have an effect upon the impact of market based schemes aimed at maintaining ecosystem services?

In the REDD+ process between the Netherlands and Indonesia, the consultation of stakeholders in the private sector and the capacity building of policy makers at the national level are the main mechanisms used to encourage collaboration between actors. Businesses have also been involved in REDD+ project development with the aim of selling or brokering carbon credits. The involvement of NGOs varies according to their belief in the ability of REDD+ to address the negative impacts of climate change. NGOs active in the REDD+ process have often in turn involved local forest communities and given them a voice in the process, as these communities tend to have little involvement in policy and decision-making and formal forest management because of their weak legal rights on forest resources.

⁴³ See for example ISEAL Alliance <http://www.isealalliance.org/our-work/credibility-principles>.

Table 8 Overview of actors engaged the four value chain innovation cases

Case	Dutch Government	Government (production countries)	NGOs	Research	Private sector	Other
IDH-STAP	DGIS	Indirectly through commodity programs	Involved in STAP as partners (e.g. WWF) but no funding	Indirectly through monitoring and evaluation studies	Dutch concession holders & processing companies, wholesalers and retailers	FSC Netherlands and support organisations
FSC & ForCES	Indirectly (DGIS and other bilateral aid) potential buyers	Indirectly through FLEGT/VPAs	Very active (ForCES: WWF, SNV, RECOFTC/ FSC:WWF, Greenpeace, SMN, ICCO)	CIFOR	FSC: concession holders & timber companies. ForCES: forest managers, concession holders, private sector in pilot Buyers of ES products as yet undefined	UN, GEF, FSC national and international, ANSAB
Dutch public procurement	Cabinet, Parliament, I&M, Rijks-waterstaat, Rijksgebouwen dienst	Indirectly through TPAC stakeholder internet forum	Indirectly through TPAC stakeholder internet forum Watch dog function (Milieudefensie, Greenpeace, ICCO, WWF)		Building contractors, timber industry, timber importers, association of Dutch Timber companies (VWNH)	Stichting Probos, Centrum Hout, Stichting Milieukeur (TPAC stakeholder internet forum), AgentschapNL, FSC-NL, PEFC-NL, PIANO, TPAC
REDD+	DGIS, BZ	National governments	Indirectly through advisers, consultants, conducting studies	Indirectly through advisers, conducting studies		UN, World Bank

Indirect role of the Dutch government

Table 9 summarizes the mix of often multiple policy instruments used by the Dutch government in the four innovation cases. These are categorised according to the different governance approaches presented in Table 5. The innovations in the FSC, IDH-STAP and REDD+ cases were led by private sector and civil society organisations. In the FSC and IDH-STAP cases, the Dutch government predominantly used facilitating and partnering instruments. For example, supporting FSC certification as part of its international cooperation policy and making funds available for organisations such as IDH and TPAC. The government actively promotes the self-regulating capacity of the tropical timber chain value chain actors, encouraging public-private partnerships such as the Green Deal on Sustainable Forest Management. In the public procurement case, the government has taken a mandating approach, setting national regulations, often in response to EU regulations. For example, the EU timber regulation prohibits placing illegally produced timber on the EU market and it is expected to increase and secure the demand for legal timber within the EU and the Netherlands.

Table 9 Policy instruments applied by the Dutch government

Case	Policy instrument			
	Endorsing	Partnering	Facilitating	Mandating
IDH-STAP	Supporting FSC certification	Public Private Partnership Green Deal SFM	Direct funding (IDH) International cooperation policy Public procurement policy	EU timber regulation
FSC	Supporting FSC certification	Green Deal SFM	Public procurement policy Bilateral aid Indirect funding through development and environmental NGOs	EU timber regulation
Dutch public procurement	Supporting FSC and PEFC certification	Multi-stakeholder procurement scheme development Green Deal SFM	Direct funding (TPAC) Public procurement pilot projects Awareness building	EU timber regulation National regulation
REDD+			Multi- and bilateral aid Strategic dialogue (REDD+ Partnership) Indirect funding through development and environmental NGOs	

The indirect role of the Dutch government in these four raises questions about the influence of the government on private regulations. The speed of success of FSC certification in ensuring sustainable forest management raises doubts about whether a more ‘command and control’ approach initiated by the government (such as the regulations used in public procurement or the tax on unsustainably produced timber, recommended in 2011 to the Dutch government by the Dutch Taskforce on Biodiversity and Natural Resources⁴⁴), – either in combination with voluntary private sector approaches or not – would be more effective in increasing the sustainability of the tropical timber value chain.

Challenges to integrating ecosystem services

The challenges for integrating ecosystem services in the international timber value chain, as identified in the four innovation cases are summarized as follows:

1. Ecosystem services is a complex concept with a terminology that is off-putting for most laymen (and even some professionals). The challenge is to make the concept and its relation to the international timber and other value chains easier to understand and more accessible for value chain actors: national governments and forest communities and their organisations in timber producing countries, Dutch timber companies and other businesses in the tropical timber sector, as well as consumers in the Netherlands.
2. There is little evidence to show the impact of certification on ecosystem services in the timber chain. There is a need for focused analysis which provides evidence from independent studies and actors that certification does indeed lead to improved ecosystem services as is often assumed.
3. The inclusion of ecosystem services in the FSC standard and similar forest management schemes (PEFC) is central to innovations such as IDH-STAP and public procurement. The challenge is to

⁴⁴ Sustainable timber is defined as that meeting criteria formulated by the Netherlands Timber Procurement Assessment Committee TPAC (2010). Dutch Timber Procurement Policy Framework for Evaluating Evidence of Compliance with Timber Procurement Requirements, Timber Procurement Assessment Committee.

make the ecosystem services addressed by certification more explicit. This could be as part of FSC certification, through certification in their own right (such as ForCES), through being part of bundles (such as carbon+REDD+FSC timber), or through bundling as part of other payments for ecosystem services type schemes.

4. Acknowledging ecosystem services can enhance the value of forests, and might help to overcome the financial barriers for mainstreaming sustainable tropical forest management. Creating different innovations for separate marketable ecosystem services may however give rise to partial optimisation of the sustainable use and maintenance of ecosystem services. The challenge is to combine the created benefits with other incentives for sustainable forest management, such as securing land tenure. Particular attention should be paid to vulnerable local users of ecosystem services, such as local communities who depend on water or soil fertility services from timber concessions and who may object to paying, which may then discourage concession holders from actions that support such services.
5. For ecosystem services certification, standards at national and international levels and related impact indicators and methodologies need to be developed and used to assess ecosystem services supply and management impacts. Outputs of the ForCES project can be useful here: generic and national indicators for the management and monitoring of ecosystem services; a methodology to assess social and environmental benefits of FSC certification; and a business model that rewards the sustainable use and maintenance of ecosystem services.
6. Currently the FSC chain of custody guarantees a product and allows traceability, rather than being a guarantee of sustainability all along the chain. Organisations and governments using FSC as a chain-wide sustainability enhancing instrument need to be aware of its limitations and address issues of the sustainability of ecosystem services along the chain using other instruments. The challenge for the Dutch government and societal partners is to promote the sustainable use and maintenance of ecosystem services at other stages of the value chain, as well as not only focusing on production areas where certification initiatives are located.

6.3 Lessons learned from the innovation system approach

In this study an innovation system approach was used to understand the interactions between innovation processes in international value chains and framework conditions, such as policies and regulations, market demand and the wider political system in which a value chain is embedded (see Section 2.7 for details on the methodology used). It was expected that by knowing how these interactions work, the dynamics of an innovation process could be explained, and the role of the Dutch government in initiatives for increasing the sustainability of international value chains assessed. In this section the triggers, drivers, barriers and opportunities⁴⁵ of the four tropical timber value chain innovation cases (see Table 10) are analysed.

The aim of this analysis is to be able to provide the Dutch government with information it can use to look beyond their current indirect involvement in initiatives to increase the sustainability of the tropical timber value chains and to recognize how the results of value chain innovations depend on how interactions between an innovation process and framework conditions work and how the leverage points of these interactions can be used and managed.

⁴⁵ In this project, the trigger of an innovation refers to the factors that stimulate or induce the start of an innovation process. The driver of an innovation is what it keeps going and allows innovations to become attractive enough to become gradually established practices.

Table 10 Triggers, drivers, barriers and opportunities in the four researched international tropical timber value chain innovation cases

Case	Triggers	Drivers	Barriers	Opportunities
Sustainable Trade Action Plan 2011-2015	Policy shift in Dutch development and economic policies ('from aid to trade') Strong plea from civil society organisations, private business and trade unions for a long term sustainability agenda	Promotion of public-private partnerships Direct funding (IDH) by Dutch government Engagement of private sector	Ecosystem services indirectly addressed through certification Singular focus on FSC/ no competition among certification schemes Immature market for ecosystem services Certified timber products: <ul style="list-style-type: none"> • The global financial crisis • Uncertain growth of demand for certified forest products • Costs of certification vs. competitive advantage for companies 	IDH approach to learning in and between different global commodity chains Green Deal Sustainable Forest Management
Forest Stewardship Council (FSC) and ForCES certification	Societal pressure for forest conservation Felt need by value chain actors for a credible system for identifying sustainable sources of forest products ForCES: <ul style="list-style-type: none"> • Voluntary PES type schemes around individual ecosystems • Awareness among FSC members that ecosystem services are not dealt with in timber concessions or in current FSC certification 	EU timber regulation Consumer (including corporate and public) demand for certified timber products Promotion of public-private partnerships Engagement of private sector Dutch public procurement policy for timber products Private business: <ul style="list-style-type: none"> • Access to environmentally sensitive markets, and corporate and public buyers • Price premiums for producers, processors and traders • Corporate social responsibility, reputation management, risk management ForCES: expected additional revenue streams for sustainable forest management	Low coverage of FSC in tropical timber producing regions Little evidence to show the impact of certification on ecosystem services and biodiversity Immature market for ecosystem services Certified timber products: <ul style="list-style-type: none"> • The global financial crisis • Uncertain growth of demand for certified forest products • Costs of certification vs. competitive advantage for companies 	High level of integration of ecosystem services in FSC standard/ scope for out-scaling the coverage of FSC certification Emerging market demand for ecosystem services certification/ additional revenue streams for timber companies and concession holders Green Deal Sustainable Forest Management
Dutch Public Procurement Policy	Dutch and EU policy changes	Direct funding (TPAC) by Dutch government Promotion of public-private partnerships Engagement of private sector	High costs of certified timber products Weak monitoring of compliance with the sustainability and legality criteria	Green Deal Sustainable Forest Management
Reducing Emissions from Deforestation and Forest Degradation (REDD+)	UNFCCC meetings Netherlands is a large importer of tropical timber products from Indonesia	UN-REDD+ Program in Indonesia Advocacy by (inter)national NGOs Dutch government: <ul style="list-style-type: none"> • Multi- and bilateral aid • REDD+ Partnership • Funding development and environmental NGOs 	No evidence to show the impact of REDD+ on forest management Immature market for ecosystem services Lack of independent verification Indonesia: <ul style="list-style-type: none"> • Insecure land tenure • Weak legal frameworks for land use planning • Decentralizations involving natural resources are incomplete 	Large amounts of international funding (e.g. FCPF) Engagement of Dutch government in REDD+ provide leverage to enhance ecosystem services Carbon credits represent a business opportunity for timber companies and concession holders

Changes in framework conditions have predominantly triggered the innovations in the four cases presented. In the IDH-STAP case, the trigger was the shift of the Dutch development cooperation policy 'from aid to trade' together with the joint plea from civil society organisations, private business and trade unions for a united and long term sustainability agenda for Dutch international trade, including timber. Innovations in the FSC and ForCES cases were triggered by organisations concerned about the conservation of forests, with both centred on making the values of ecosystem services and products explicit and tradable, as a way of conserving them. They are derived from the mixed success and high costs of conventional conservation approaches and are based upon an assumption that timber can be sustainably exploited if voluntary, externally certified standards are adhered to. The EU timber regulation that became effective in March 2013, reinforces the market potential of FSC certified products and follows a similar market-led approach to sustainable exploitation. Innovations in Dutch public procurement were triggered by both Dutch and EU policy changes. The REDD+ innovations originate from the 13th UN Framework Convention on Climate Change (UNFCCC) conference and succeeding Conference of Parties (COP) meetings. Although endorsed by the international research and development agendas, uptake has been very slow and difficult in practice.

To a large extent market opportunities drove the innovation process in the IDH-STAP and FSC cases. Increasing corporate and public consumer demand for certified products, enable access to environmentally sensitive markets by using price premiums to reward timber producers, processors and traders for sustainable operations. Additionally, public-private partnerships were promoted by the Dutch government and governmental funds for agencies such as IDH and TPAC, sustained the innovation process in the IDH-STAP, FSC and public procurement cases. Funding of (inter)national development and environmental NGOs fuels the REDD+ process, in particular for their advocacy and 'watch dog' roles.

The barriers to innovations in the four cases also predominantly originate in the contexts in which the chains are embedded. For example, in the IDH-STAP, FSC/ForCES and REDD cases, the difficulties in valuing ecosystem services and in particular the immature market for ecosystem products forms a significant barrier. Similarly, expanding the scale of certification of tropical timber production and reducing the costs are barriers. Issues in ecosystem certification include ascertaining who owns, who can trade and who can benefit from payments for services and whether or not one should exclude beneficiaries who may be unable to pay for the benefits (e.g. water, watersheds or non-timber forest products) located in the ecosystem providing these services⁴⁶.

The analysis of triggers, drivers, barriers and opportunities in the four cases illustrates that the dynamics of value chain innovation and their achievements depend to a large extent on framework conditions, in particular market demand for certified products (IDH/STAP and FSC/ForCES) and the institutional environment (public procurement and REDD+). The analysis also shows that the current activities of the Dutch government in addressing the complex challenge of sustainable international value chains are geared towards initiating and facilitating cooperation between value chain actors in the form of public-private partnerships, and the promotion of financial and institutional support of the certification of timber products. Although market actors and civil society organisations have been in the driving seat it remains to be seen if the private sector is willing and able to take up these issues, begging the question what the role of government should be.

⁴⁶ See the WOT publication that is part of this project: Arets and Leneman (2013) Effects of Dutch import of tropical timber on ecosystem services and social costs and benefits of more sustainable production.

6.4 Governance options for the Dutch government

The lessons learnt from the analysis of the four innovation cases, has resulted in the following five recommendations for the Dutch government on how to further integrate sustainable use and maintenance of ecosystem services in the tropical timber chain:

1. Consider developing a clear and coherent policy implementation strategy that makes clear and explicit the role of ecosystem services in policy concepts such as 'sustainable inclusive growth', 'natural capital' and 'green economic growth'.
2. Consider (more direct) governmental engagement in multi-stakeholder learning platforms such as the EU Sustainable Tropical Timber Coalition, REDD+ Business Initiative (Platform BEE) and Tropical Forest Alliance and Green Deals, to increase consumer & business-to-business awareness of biodiversity and ecosystem services to change consumer preferences and purchasing decisions.
3. Consider funding studies to show the impact of certification schemes on ecosystem services and of pilots to explore how ecosystem services could be further integrated into timber chains, including new sorts of certification (e.g. ForCES) specific to ecosystem services (alone or in bundles), through partnerships with companies, civil society and research.
4. Re-consider current policy instruments that stimulate (timber) product certification. Other instruments are needed to help the private sector to respond to the market opportunities for ecosystem services, for example by incentivizing demand for ecosystem services through fiscal incentives.
5. Re-consider governmental involvement in standard settings of certification schemes, to ensure that ecosystem services are explicit and the monitoring of the functioning of the systems and outcomes occurs.

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Consulted websites

- <http://www.redd.wur.nl/>
- <http://www.oneworld.nl/>
- <http://reddpluspartnership.org/>
- http://reddplusdatabase.org/country_institutions/52/redd
- <http://www.illegal-logging.info>

Annex 1 Discourse analysis: methodology and selected documents

The identification of frames is a deductive process. By identifying the framing and reasoning devices and how they are used in combination, the reoccurring patterns and subjects can be identified. These are the basics of the frame that determine the assumptions that underlie the policy discourse. These two devices of a frame are the main objects of research in the discourse analysis. This analysis focuses on the collaboration between different societal actors and therefore also addressed if and how solutions and responsibilities are mentioned.

As this study concerns policy discourses on ecosystem services and value chains, a two way approach to identify framing devices was taken. Ecosystem services was the main search term in the selected documents. Secondly text that addresses any of the reasoning devices with regard to sustainable value chains were analysed for re-occurring use of words and concepts. The data sources for this study were selected to provide a valid representation of the current vision of the Dutch government on increasing the sustainability of value chains and specifically the role of different actors therein. The sources were therefore selected on the basis of the following criteria:

1. The source is available in textual form.
2. The source is not older than 2007.
3. The sources include discourses from all relevant ministries to the topic sustainability of value chains (Foreign Affairs, BZ, I&M, Environment and EL&I).

The search for source documents commenced with a selection of documents sourced from websites of Ministries concerned with the subject of sustainable value chains, using the following keywords: "sustainable value chains/ value chains and/or biodiversity/ ecosystem services" in combination with the term "business / private actors / golden triangle". The search resulted in nine documents of which seven were selected. Both the Extensive government's response to the SER 'Sustainable globalization: a world to win " and the Focus letter on International Cooperation have not been included in the final analysis, as they included very limited references to ecosystem services and/or biodiversity. The seven selected documents shown in Box A.1 represent three types of policy documents:

Box A.1 Dutch policy documents concerning ecosystem services

Responses to external policy and advice:

1. Letter from the Ministry of EA in response to the advice of the Taskforce Biodiversity and Natural Resources (EL&I 2012)
2. Letter of appreciation of the Ministry of EA concerning the European Biodiversity Strategy (EL&I 2011)

Policy documents addressing value chains and/or ecosystem services:

3. Government Commodity note (Kabinet 2011)
4. Government Sustainability agenda, a green growth strategy for the Netherlands (I&M 2011)
5. Biodiversity Policy 2008-2011 "Biodiversity works for nature for people forever" (LNV 2008)

Policy documents on governance and collaboration:

6. Background document for the budget of the Ministry of EA 2011 (Tweede Kamer 2011)
7. Government vision paper on governance and administrative structure (BZK 2011).

These text documents were coded using five types of reasoning devices (problem description, causal interpretation, moral evaluation and solutions and responsibilities). Secondly quotations in the texts were analysed using framing devices, such as key words, concepts and metaphors. These were coded using Atlas-ti software.

Annex 2 Guiding questions for value chain innovation case studies

Detailed innovation history (what innovations occurred where in the chain- plot in the chain)

- What sequence of technical, technological, social, organizational or institutional innovations has emerged during the innovation process?
- How do these different innovation types relate, and do not relate to one another?
- Where did the innovations take place in the chain, how, why and when?
- What are the key phases that can be identified?
- Did the nature of the innovation process change over time, and if yes, why and with what impact?
- What was the nature of the innovation process? Was it governed or engineered and did it follow a planned course? Were there any critical events, which ones and why?

Framework conditions

- What are the frameworks conditions in which the value chain is embedded and operating?

Opportunities and barriers, triggers and drivers

- What are key opportunities and barriers, the key triggers and drivers which have influenced innovation development? At what stage(s) did they play a major role?

Description of process dynamics in case

- Identification of stakeholders having taken part in the innovation process, and identification of all potentially concerned stakeholders (i.e. missing stakeholders):
 - Who were the stakeholders, what were their roles and contributions?
 - Were any stakeholders somehow left out of the innovation process, why and with what consequences?
 - Did the stakeholders in the innovation process, or their roles and contributions change over time, and if yes, why and with what impact?
- Identification of relationships between stakeholders, in terms of knowledge, power, function and network (rules of the game):
 - How did the various stakeholders within the innovation process link up?
 - Have these linkages been sufficient and/or strong enough to facilitate innovation?
 - Have there been formal partnerships/alliances between (some) stakeholders in the innovation process? What role did these plays?
 - What specific factors and conditions have allowed stakeholders to take an active role in the innovation process, or on the contrary, have prevented them from doing so?

Learning processes between chain actors (individuals and organisations)

- Shared frame, mutual trust and commitment:
 - Heterogeneous learning network.
 - Shared vision/ perception of major opportunities and barriers/ perception of solutions/ ways forward.
 - Regular interactions between the stakeholders (how, where and when).
 - Open communication, honesty and consistence between words and action.
 - Engagement of stakeholders to providing knowledge/ skills/ time.

Lessons learnt

- What and how:
 - Power/conflicts
 - Major discourse to unravel how innovation and learning occurs and the relationships which foster learning, the actors, institutions and processes of change.

Annex 3 Ecosystem services in FSC principles and criteria

General conclusion

The FSC general principles and criteria and those specifically worked out on a national level (FSC, 2002; FSC, 2010) do address all the aspects of the ecosystem services model. All the four types of Goods and Services, human well-being, biodiversity and Ecosystem functions are mentioned with explicitly or implicitly. The majority of the four categories are implicit largely because of a difference in terminology. Many of the MEA terms are referred to using slightly different language. However commonality can be seen in terms e.g. Goods (in MEA language) = products and resources (FSC language), Biological diversity and Diversity = biodiversity, Social= cultural services, chain of custody = value chain. In some cases, specific services are mentioned (e.g. habitat, watersheds), rather than the overall category. In other principles, the category is mentioned. The specific words relating to ecosystem services are highlighted in **blue** in the following table.

Principle	Brief description	Sub principle	Ecosystem services Explicit	Ecosystem services Implicit	Remarks
1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES	Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.	1.3.3: forest manager possess a list of all locally occurring species listed by CITES 1.3.4. The forest manager shall have copies of national legislation and/or an administrative requirement relating to the implementation of CITES , obligations at the national level, and ensures that these requirements are implemented within his FMU.		Goods Biodiversity	
PRINCIPLE #2: TENURE AND USE RIGHTS AND RESPONSIBILITIES	Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.	2.2.1: The Forest manager shall have carried out a multi-resource inventory or commissioned a third party to do it, which shall be updated regularly and in compliance with applicable standards. 2.2.3: Populations' use rights shall be discussed during negotiation meetings and integrated in the simplified management plan.		Goods Cultural services	
PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS	The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognized and respected	3.3 Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized and protected by forest managers. 3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence.		Goods Cultural services Goods Regulating services Support services	

Principle	Brief description	Sub principle	Ecosystem services Explicit	Ecosystem services Implicit	Remarks
PRINCIPLE #4: COMMUNITY RELATIONS AND WORKERS' RIGHTS	Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.	4.4 Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups directly affected by management operations.		Human well-being Goods Cultural services Supporting services	
PRINCIPLE #5: BENEFITS FROM THE FOREST	Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.	5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest. 5.1.1: Yearly programming and budgeting shall include all products sourced from the forest (timber, NTFPs, environmental services) 5.2 Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products 5.3 Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources. 5.5 Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.	Goods Regulating services	Human well- being Goods Supporting services Biodiversity	
PRINCIPLE #6: ENVIRONMENTAL IMPACT	Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and	6.1 Assessment of environmental impacts shall be completed –appropriate to the scale, intensity of forest management and the uniqueness of the affected resources –and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities.	Biodiversity Regulating services Supporting services	Goods Human well- being	Adds in concept of landscapes Glossary indicates that that natural cycles and succession can be seen as terms

Principle	Brief description	Sub principle	Ecosystem services Explicit	Ecosystem services Implicit	Remarks
	fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.	<p>Environmental impacts shall be assessed prior to commencement of site-disturbing operations.</p> <p>6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas).</p> <p>Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.</p> <p>6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:</p> <p>a) Forest regeneration and succession.</p> <p>b) Genetic, species, and ecosystem diversity.</p> <p>c) Natural cycles that affect the productivity of the forest ecosystem.</p>			addressed in Regulating and Supporting services Ecosystem diversity= biodiversity
PRINCIPLE #7: MANAGEMENT PLAN	A management plan –appropriate to the scale and intensity of the operations – shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated	<p>7.1 The management plan and supporting documents shall provide:</p> <p>a) Management objectives.</p> <p>b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.</p> <p>c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.</p> <p>d) Rationale for rate of annual harvest and species selection.</p> <p>e) Provisions for monitoring of forest growth and dynamics.</p> <p>f) Environmental safeguards based on environmental assessments.</p> <p>g) Plans for the identification and protection of</p>		All Goods & Services Biodiversity Ecosystem functions Human well- being	Makes explicit the goods and services in a plan -

Principle	Brief description	Sub principle	Ecosystem services Explicit	Ecosystem services Implicit	Remarks
		rare, threatened and endangered species. h) Maps describing the forest resource base including protected areas, planned management activities and land ownership. i) Description and justification of harvesting techniques and equipment to be used			
PRINCIPLE #8: MONITORING AND ASSESSMENT	Monitoring shall be conducted – appropriate to the scale and intensity of forest management –to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts	8.1 The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations as well as the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change.		All Goods & Services Biodiversity Ecosystem functions Human well- being	Details how these goods & services are monitored and measured- but in practice is more focus on goods, cultural services and biodiversity than on regulating and supporting services
PRINCIPLE #9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS	Management activities in high conservation value forests shall maintain or enhance the attributes which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach	See Glossary for HCV	Biodiversity Well- being	All goods and services? As part of term “rare, threatened or endangered ecosystems”??	Unclear who/how assessment of “rare, threatened or endangered ecosystems” made...

Principle	Brief description	Sub principle	Ecosystem services Explicit	Ecosystem services Implicit	Remarks
Principle #10: PLANTATIONS	Plantations shall be planned and managed in accordance with Principles and Criteria 1 - 9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.	<p>10.3 Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.</p> <p>10.6 Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.</p> <p>10.7 Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.</p> <p>10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and</p>		Biodiversity Regulating services Supporting services Cultural services	

Principle	Brief description	Sub principle	Ecosystem services Explicit	Ecosystem services Implicit	Remarks
		impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.			
Glossary	Chain of custody Forest integrity			Regulating services Supporting services	Another term for value chain, the standard stresses traceability in chain

FSC glossary explains the following terms:

Biological diversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems. (See Convention on Biological Diversity, 1992)

Biological diversity values: The intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components. (See Convention on Biological Diversity, 1992)

Chain of custody: The channel through which products are distributed from their origin in the forest to their end-use.

Ecosystem: A community of all plants and animals and their physical environment, functioning together as an interdependent unit.

Forest integrity: The composition, dynamics, functions and structural attributes of a natural forest.

High Conservation Value Forests: High Conservation Value Forests are those that possess one or more of the following attributes:

a) Forest areas containing globally, regionally or nationally significant:

- concentrations of biodiversity values (e.g. endemism, endangered species, refugia); and/or
- Large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

b) Forest areas that are in or contain rare, threatened or endangered ecosystems.

c) Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

d) Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Landscape: A geographical mosaic composed of interacting ecosystems resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area.

Natural cycles: Nutrient and mineral cycling as a result of interactions between soils, water, plants, and animals in forest environments that affect the ecological productivity of a given site.

Succession: Progressive changes in species composition and forest community structure caused by natural processes (nonhuman) over time.

Annex 4 Interviews & Resource persons

Guideline for interviews

1. Introduce project (see excerpt)
2. Explain value chain and ecosystem services concepts (figures 1 and 2 in Version 6 of our draft document)
3. Ask when, why and how the organisation addressed ecosystem services the specific value chain case(s)
4. Suggestions for opportunities and challenges of how to give ecosystem services a more explicit role in value chains (main aim of research)

Resource persons

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Verschenen documenten in de reeks Werkdocumenten van de Wettelijke Onderzoekstaken Natuur & Milieu vanaf 2011

Werkdocumenten zijn verkrijgbaar bij het secretariaat van Unit Wettelijke Onderzoekstaken Natuur & Milieu, te Wageningen. T 0317 – 48 54 71; E info.wnm@wur.nl

De werkdocumenten zijn ook te downloaden via de WOT-website www.wageningenUR.nl/wotnatuurenmilieu

- 2011**
- 222** *Kamphorst, D.A. & M.M.P. van Oorschot.* Kansen en barrières voor verduurzaming van houtketens
- 223** *Salm, C. van der & O.F. Schoomans.* Langetermijneffecten van verminderde fosfaatgiften
- 224** *Bikker, P., M.M. van Krimpen & G.J. Remmelink.* Stikstofverteerbaarheid in voeders voor landbouwhuisdieren; Berekeningen voor de TAN-excretie
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- 230** *Jaarrapportage 2010.* WOT-04-001 – Koepel
- 231** *Jaarrapportage 2010.* WOT-04-002 – Onderbouwend Onderzoek
- 232** *Jaarrapportage 2010.* WOT-04-003 – Advisering Natuur & Milieu
- 233** *Jaarrapportage 2010.* WOT-04-005 – M-AVP
- 234** *Jaarrapportage 2010.* WOT-04-006 – Natuurplanbureaufunctie
- 235** *Jaarrapportage 2010.* WOT-04-007 – Milieuplanbureaufunctie
- 236** *Arnouts, R.C.M. & F.H. Kistenkas.* Nederland op slot door Natura 2000: de discussie ontrafeld; Bijlage bij WOT-paper 7 – De deur klemt
- 237** *Harms, B. & M.M.M. Overbeek.* Bedrijven aan de slag met natuur en landschap; relaties tussen bedrijven en natuurorganisaties. Achtergronddocument bij Natuurverkenning 2011
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