



Wettelijke Onderzoekstaken Natuur & Milieu

Integrating ecosystem services into tropical commodity value chains - cocoa, soy and palm oil

Dutch policy options from an innovation system approach

| WOt-technical report 6

J. van den Berg, V.J. Ingram, L.O. Judge & E.J.M.M. Arets



WAGENINGEN UR
For quality of life

**Integrating ecosystem services into tropical commodity value chains –
cocoa, soy and palm oil**

This WOt-technical report was produced in accordance with the Quality Manual of the Statutory Research Tasks Unit for Nature & the Environment.

The 'WOt-technical reports' series presents the findings of research projects implemented for the Statutory Research Tasks Unit for Nature & the Environment by various centres of expertise.

WOt-technical report 6 presents the findings of a research project commissioned by PBL Netherlands Environmental Assessment Agency 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.

Integrating ecosystem services into tropical commodity value chains – cocoa, soy and palm oil

Dutch policy options from an innovation system approach

J. Van den Berg, V.J. Ingram, L.O. Judge & E.J.M.M. Arets

Statutory Research Tasks Unit for Nature & the Environment (*WOT Natuur & Milieu*)

Wageningen, December 2014

WOT-technical report 6

ISSN 2352-2739

Abstract

Berg, J. van den, V.J. Ingram, L.O. Judge & E.J.M.M. Arets (2014). *Integrating ecosystem services into tropical commodity value chains - cocoa, soy and palm oil; Dutch policy options from an innovation system approach*. Statutory Research Tasks Unit for Nature & the Environment, Wageningen UR. WOt-technical report, 102 p. 14 Figs; 9 Tabs; 65 Refs; 1 Annex.

This technical report explores the governance options available to the Dutch government to promote the sustainable use and maintenance of ecosystem services in tropical commodity value chains with Dutch links. It examines how ecosystem services can be given a more explicit role in public and market mechanisms, using the cocoa, soy, palm oil and timber chains as case studies. The document presents a discourse analysis of the way Dutch policies and practice address ecosystem services, updating the report of a forerunner study on the timber chain (Van den Berg *et al.* 2013). The discourse analysis indicates that the term ecosystem services still lacks a clear definition in Dutch policy, with ecosystem services largely being seen as an economic issue, which can be solved by market drive, voluntary and multi-actor value chain based solutions. The report presents results of a detailed examination of specific cases of innovation in sustainability initiatives and payments for ecosystem services projects in the cocoa chain, the Round Table for Responsible Soy (RTRS) and the Round Table for Sustainable Palm Oil (RSPO). Lessons learnt from the analysis of these cases include the need to simplify what is meant by ecosystem services – for example using the term natural capital – to make it more appealing and intuitive, particularly for business. More evidence is needed on the impact of certification and how it maintains or enhances ecosystem services. Internationally agreed impact indicators are also recommended. The array of available certification schemes could be harmonised. A mix of policy instruments appears to offer more scope for the government, using market based ‘carrots’ and incentive-based ‘sticks’ (such as tax incentives and pilot projects) to stimulate new partnerships and initiatives. Challenges include giving ecosystem services an explicit role in policy-supported innovations, and engaging with all value chain stakeholders, particularly community and consumer organisations.

Recommendations for the Dutch government on how to further integrate sustainable use and maintenance of ecosystem services in the tropical commodity chains include:

1. Developing a clear and coherent strategy that makes explicit the role of ecosystem services in policy concepts such as ‘sustainable inclusive growth’, ‘natural capital’ and ‘green economic growth’.
2. Re-considering the policy instruments used and expanding them from the voluntary product certification which is the main instrument currently in use. Alternative instruments to help the private sector respond to market opportunities for ecosystem services could stimulate demand through tax incentives.
3. Ensuring a coherent approach across ministries when using indirect policy tools that facilitate and endorse innovations from behind the scenes.
4. Exploring options to exert more influence on ecosystem services impacted at other stages in the chain, especially activities taking place in Netherlands (processing and consumption), not just production.
5. Increasing the available knowledge about natural capital values and natural capital accounting (i.e. costs and benefits) in tropical commodity chains, to allow more informed decision making about the true costs and benefits of products processed and traded in the Netherlands.

© 2014 **Alterra Wageningen UR**

PO Box 47, 6700 AA Wageningen

Phone: (0317) 48 07 00; e-mail: info.alterra@wur.nl

LEI Wageningen UR

PO Box 29703, 2502 LS Den Haag

Phone: (070) 335 83 30; e-mail: informatie.lei@wur.nl

The WOt-technical reports 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

Statutory Research Tasks Unit for Nature & the Environment, P.O. Box 47, NL-6700 AA Wageningen
Phone: +31 317 48 54 71; e-mail: info.wnm@wur.nl; Internet: www.wageningenUR.nl/wotnatuurenmilieu

All rights reserved. No part of this publication may be reproduced and/or republished by printing, photocopying, microfilm or any other means without the publisher's prior permission in writing. The publisher accepts no responsibility for any damage ensuing from the use of the results of this study or from the implementation of the recommendations contained in this report.

Preface

We are appreciative of and acknowledge the collaboration with Mark van Oorschot and Marcel Kok of the Netherlands Environmental Assessment Agency (PBL), Frank Veeneklaas of WOT N&M / Alterra Wageningen UR and Pieter van Beukering of the Institute for Environmental Studies, VU University Amsterdam on this study.

We are grateful to those that contributed to the earlier work of Van den Berg *et al.* (2013) on which this study builds. We thank representatives from IDH, UTZ Certified, Continaf, Cargill, Solidaridad, ICCO, EZ, NCRC, CREM, University of Reading, RTRS, RSPO, WWF and IUCN who were contacted for this study and who shared their ideas, information and expertise on the cocoa, soy, palm oil and timber value chains.

Jolanda Van den Berg

Verina Ingram

Lucas Judge

Eric Arets

Contents

Preface	5
Summary	9
Abbreviations	12
1 Introduction and methodology	13
1.1 Introduction	13
1.2 Aim and research questions	13
1.3 Research methods	15
2 Conceptual approach and methodological framework	19
2.1 Introduction	19
2.2 Ecosystem services	19
2.3 The problems and opportunities of addressing ecosystem services	20
2.4 Political ecology	22
2.5 Innovation and innovation systems	22
2.6 Value chains	24
2.7 Methodological framework	27
3 Dutch policy discourse on ecosystem services and international value chains	29
3.1 Introduction	29
3.2 Ecosystem services: policy area in development	29
3.3 Strong policy belief in market-driven solutions	33
3.4 Focus on multi-actor value chain governance	34
3.5 Synthesis	37
4 The cocoa value chain	39
4.1 Introduction	39
4.2 The cocoa value chain	39
4.2.1 Background	39
4.2.2 Ecosystem services and the value chain	42
4.2.3 Process dynamics	42
4.2.4 Framework conditions	43
4.3 Cocoa value chain innovation cases	44
4.3.1 Innovation history	45
4.3.2 Triggers and drivers, opportunities and barriers	47
4.3.3 Learning processes	48
4.3.4 Extent to which ES are explicitly mentioned	48
4.3.5 Role of and policy instruments applied by the Dutch government	49
4.3.6 Interactions between process dynamics and framework conditions	50
4.4 Cocoa PES	50
4.4.1 Innovation history	50
4.4.2 Triggers and drivers, opportunities and barriers	51
4.4.3 Learning processes	53
4.4.4 Extent to which ES are explicitly mentioned	53
4.4.5 Role of and policy instruments applied by the Dutch government	53
4.5 Implications for Dutch policy	53

5	The soy value chain	55
5.1	Introduction	55
5.2	The soy value chain	55
5.2.1	Background	55
5.2.2	Ecosystem services and the value chain	56
5.2.3	Process dynamics in the soy chain	57
5.2.4	Framework Conditions	59
5.3	Innovation case – Round Table for Responsible Soy (RTRS)	60
5.3.1	Innovation history	60
5.3.2	Triggers and drivers, barriers and opportunities	63
5.3.3	Learning processes	64
5.3.4	Process dynamics within the RTRS	64
5.3.5	Framework conditions	64
5.3.6	Role of and policy instruments applied by the Dutch government	65
5.4	Implications for Dutch policy	65
6	The palm oil value chain	67
6.1	Introduction	67
6.2	The palm oil value chain	67
6.2.1	Background	67
6.2.2	Ecosystem services and the value chain	69
6.2.3	Framework conditions	69
6.3	Innovation case - Round Table for Sustainable Palm Oil (RSPO)	70
6.3.1	Innovation history	70
6.3.2	Process dynamics within the RSPO	74
6.3.3	Triggers and drivers, opportunities and barriers	75
6.3.4	Role of and policy instruments applied by the Dutch government	78
6.4	Implications for Dutch policy	78
7	Key findings and governance options for sustainable use and maintenance of ecosystem services	81
7.1	Introduction	81
7.2	The value chain innovation cases revisited	81
7.3	Lessons learned from the innovation system approach	86
7.4	Governance and policy options for the Dutch government	89
	References	93
	Justification	100
Annex 1	Guiding questions for value chain innovation case studies	101

Summary

The term 'ecosystem services' describes 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). Services can be grouped into four broad categories: provisioning (also known as goods), regulating, supporting and cultural. A growing awareness of the role of ecosystem services in enabling human habitation and economic activity has been accompanied by an acknowledgement of the threat posed by human activities to the long-term ecosystem health. To inform decision makers about the importance of ecosystem services and stimulate policies that improve the management of the ecosystems supporting and providing them, public, private and research initiatives are underway to make ecosystem services more visible, for example by calculating their value.

This study explores the governance options available to the Dutch government to promote the sustainable use and maintenance of ecosystem services in tropical commodity value chains with Dutch links. The study examines how ecosystem services can be given a more explicit role in public and market mechanisms that govern soy, cocoa, palm oil and timber chains, by studying cases of sustainability initiatives and projects involving payments for ecosystem services in the cocoa chain, the Round Table for Responsible Soy (RTRS) and the Round Table for Sustainable Palm Oil (RSPO). These cases were chosen after reviewing the priority products from the Sustainable Trade Action Plan (STAP) and consulting with the government's Economics of Ecosystems and Biodiversity (TEEB) steering group. This work builds on a forerunner study on integrating ecosystem services in the tropical timber chain (Van den Berg *et al.* 2013). The report shows how the feedback process (between perceptions of value and ecosystem management) can be influenced to take ecosystem services into account in chains in which the Netherlands has a significant economic interest. 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.

Questions guiding the study were:

1. What are the assumptions behind the roles of research, business and civil society 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 commodity value chains? And how has the concept evolved into practical sustainability initiatives in the cocoa, soy and palm oil value chains?
3. What can we learn from sustainability initiatives in the various tropical commodity value chains?
4. What can we learn from an innovation system approach for the sustainable use and maintenance of ES in the tropical commodity value chains?
5. What possible strategies and instruments can be recommended to the Dutch government?

Assumptions about ecosystem services

The first question, how ecosystem services are positioned in Dutch policies and practices, was examined by conducting a discourse analysis which updates the situation described in Van den Berg *et al.* (2013). Notable changes in the discourse include that ecosystem services are now seen to be positioned in Dutch policy as both a global, European and national issue. The analysis indicates that the term ecosystem services still lacks a clear definition and has largely been seen as an economic issue. Ecosystem services are predominantly related to markets and payment mechanisms, while biodiversity is associated with management and sustainable trade chains. The main suggestion in the policy documents, though more explicitly in some than in others, is that the main cause of ecosystem degradation is the fact that the costs of biodiversity and ES are not being incorporated in market prices. This has resulted in attempts to define the economic value of ecosystem services. The analysis of the four chains further highlights that ecosystem services are not explicitly mentioned in present-day value chain innovations. Certification – one of the main mechanisms used to promote sustainable

chains – in the cocoa and timber chains been an exception, indirectly driving the integration of ecosystem services in six cases.

We examined the assumptions about the roles of research, business and civil society underlying the Dutch policies to increase the sustainability of international value chains. The involvement of different stakeholders in the chains was seen in all cases as critical to the success of the innovation process. Multi-stakeholder partnerships (involving the private sector, non-government and civil society organisations and research institutes) were common ways of triggering and implementing innovations. The participation of civil society and consumers (private, corporate or public) in implementing the innovations was generally low or absent in the initiatives. The Dutch government was involved mostly in a facilitating and endorsing role, often with minimal liaison with governments in countries where the primary production takes place. The indirect role of the Dutch government in the cases raises questions about the effectiveness of such tools. The slow speed of success of certification in ensuring sustainable management of cocoa, timber, soy and palm oil and in engaging the majority of stakeholders involved in chains and commodities entering both Dutch and international markets, raises the question whether a more 'command and control' oriented approach would have been a faster approach to increasing the sustainability of the tropical chains.

Importance of ecosystem services

The second question examined the importance of ecosystem services in the tropical commodity value chains and the way the concept is applied in initiatives in the cocoa, soy and palm oil value chains. Ecosystem services were generally only implicitly addressed using case studies of innovation in the four chains. Ecosystem services were regarded as one element of a wider objective, namely to increase the sustainability of international commodity value chains. Ecosystem services were explicitly mentioned in only one of the case studies, about payments for ecosystem services in cocoa, but this failed to become a full pilot study. This appears to be changing, as the simpler and more appealing term 'natural capital' is increasingly being used in preference to ecosystem services. The link between natural capital and value chain sustainability has also been made more explicit by including ecosystem services and related terms such as conservation and sustainable use of biodiversity as criteria in the Dutch Parliament's 'Natural Capital Agenda'.

Sustainability initiatives

The third question examined what could be learnt from sustainability initiatives in the tropical commodity value chain cases. The four chains illustrate that there were technical, organisational, economic and institutional innovations, and that these dimensions were interwoven. The complex challenges of increasing the sustainability of international value chains resulted in 'bundles of innovation', with different innovations occurring in parallel. The most popular were partnerships, certification and promoting awareness of sustainability as a goal to develop new business practices. In only one case were statutory measures introduced, in the form of public procurement regulations in the timber chain. Most innovations focussed on the producer stage of the chain and on platforms and networks of chain stakeholders.

Innovation system approach

The fourth question looked at what could be learnt by using an innovation system approach to examine the sustainable use and maintenance of ecosystem services in the tropical commodity value chains. Lessons learnt from the cases include the need to simplify what is meant by ecosystem services. For example, the term natural capital is more appealing and intuitive, particularly for business. More evidence is needed on the impact of certification and the way it maintains or enhances ecosystem services, along with internationally agreed impact indicators. The array of certification schemes available could be harmonised, especially regarding the inclusion of ecosystem service safeguards. A mix of policy instruments appears to offer the government a wider scope, using market based 'carrots' and incentive-based 'sticks' (such as tax incentives and pilot projects, and public procurement) to stimulate new partnerships and initiatives. Challenges include making ecosystem services explicit in policy-supported innovations, by engaging with all value chain stakeholders, particularly community and consumer organisations. The innovation system approach illustrated that processes were important in bringing together diverse groups of chain stakeholders, some of whom had not traditionally or previously worked together, due to the segmented, fragmented nature of

chains and their international character. The innovations in the cases were predominantly triggered by changes in framework conditions, including a shift in 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 concerted, long-term sustainability agenda for Dutch international trade. Market opportunities have driven the innovation process in terms of using standards and certification. The following variables emerged as critical to enabling innovation in the chains studied:

- (i) The meso- and macro-contexts strongly influence value chain stakeholders.
- (ii) The strategies (i.e. business models) used by stakeholders are mainly platforms, partnerships, standards and procurement policies.
- (iii) Concrete incentives (i.e. drivers) encourage stakeholders in the chains to undertake innovation (e.g. public funding, management, inter-firm organisations).
- (iv) Information sharing about the way innovation evolved and emerged, its impacts over time, and critical successes have further fed successes and continuance of the innovation.

Possible strategies and instruments

The fifth question concerned the possible strategies and instruments which could be used in Dutch policies. The following recommendations are made on ways to further integrate the sustainable use and maintenance of ecosystem services in the tropical commodity chains:

- (i) Developing a clear and coherent strategy that makes explicit the role of ecosystem services in policy concepts such as 'sustainable inclusive growth', 'natural capital' and 'green economic growth'.
- (ii) Re-considering the policy instruments used, expanding from a focus on voluntary product certification to alternative instruments which support the private sector in responding to market opportunities for ecosystem services, for example stimulating demand by using tax.
- (iii) Ensuring the use of a coherent approach across ministries when using indirect policy tools that facilitate and endorse innovations from behind the scenes.
- (iv) Exploring possibilities to exert more influence on ecosystem services impacted at other stages in the chain, especially activities taking place in Netherlands (processing and consumption), rather than just production.
- (v) Increasing the available knowledge about natural capital values and natural capital accounting, and about the costs and benefits of enhancing sustainability and reducing the impact on ecosystem services in tropical commodity value chains.
- (vi) Specific recommendations concerning each commodity chain include making use of the interconnections between chains and the experiences gained in other chains, government involvement in certification, the link with letters of intent and, for example, supporting all stakeholders in their efforts to gain insights into the costs and benefits of certification based on ecosystem services.

Abbreviations

ACI	African Cocoa Initiative
CAOBISCO	Association of Chocolate, Biscuit and Confectionery Industries of Europe
CBD	Convention on Biological Diversity
CBL	Centraal Bureau Levensmiddelenhandel/Dutch Food Retail Association
CCC	Coffee and Cocoa Council (<i>Conseil du Café Cacao</i>)
CDC	Cocoa Development Centers
CIP1	Cocoa Improvement Program 1
COPAL	Alliance of Cocoa Producing Countries
CPQP	Cocoa Productivity and Quality Program
CVC	Coco Village Clinics
ECA	Européen Coco Association
EFA	Projet Ecoles Familiales Agricoles
ES	Ecosystem Services
FIRCA	Fonds Interprofessionnel pour la Recherche et le Conseil Agricole
GAP	Good Agricultural Practice
GIZ	German International Cooperation / (Agency Deutsche (Gesellschaft für Internationale Zusammenarbeit)
GlobalGAP	Private sector voluntary standards setting body for certification of production processes for agricultural products
ICCO	International Cocoa Organisation
ICI	International Cocoa Initiative
ICRAF	World Agroforestry Center
ICS	Internal Control System
IDH	Sustainable Trade Initiative
IITA	International Institute of Tropical Agriculture
ILO	International Labour Organisation
KNVKT	Koninklijke Nederlandse Vereniging van Koffie en Thee/Royal Dutch Coffee and Tea Association
IECD	Institut Européen de Coopération et Développement
LEI	Agricultural Economics Institute of Wageningen UR
MDG	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
PBL	Netherlands Environmental Assessment Agency
PBS	Promotiebureau biologische speciaalzaak/Promotion Agency Organic Specialty Store
PDDA	Master Plan for Agricultural Development
PEFAC	Plateforme des Ecoles Familiales Agricoles de Côte d'Ivoire
PRODEMIR	Programme de Développement Economique en Milieu Rural
RA	Rainforest Alliance
RSPO	Round Table on Sustainable Palm Oil
RSPO P&C	Principles and Criteria for Sustainable Palm Oil Production
RTRS	Round Table for Responsible Soy
STAP	Sustainable Trade Action Plan
STCP	Sustainable Tree Crops Program
TEEB	Economics of Ecosystems and Biodiversity
UNDP	United Nations Development Fund
UNFCC	United Nations United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
VBP/PBS	Vereniging Biologische Producenten en Handel/Organic Producers and Trade Association
VBZ	Vereniging voor de Bakkerij- en Zoetwarenindustrie/Dutch Association for the Bakery and Confectionery Industry
VNO/NCW	Confederation of Netherlands Industry and Employers
VPA	Voluntary Partnership Agreement
WCF	World Cocoa Foundation
Wot/KO	Statutory Research Task/Knowledge assignment
WTO	World Trade Organization
WWF	Worldwide Fund for Nature

1 Introduction and methodology

1.1 Introduction

This study builds upon the work by Van den Berg *et al.* (2013) in the study titled '*Integrating ecosystem services in international value chains – An innovation system framework for evaluating Dutch policy support for integrating ecosystem services in tropical timber chains*'. This work and the 2013 study both contribute to the Netherlands Environmental Assessment Agency (PBL) TEEB for Dutch supply chains project, coordinated in cooperation with the Dutch Ministries of Economic Affairs and Foreign Affairs. This study aims to generate insights into the economic effects of resource production in terms of societal costs and benefits, biodiversity and the use of ecosystem services (ES) in the value chain, extending from producing to consuming regions. This publication also 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 ES in international value chains.

Van den Berg *et al.* (2013) looked at the governance options¹ available to the Dutch government for promoting the sustainable use and maintenance of ES in tropical timber value chains with Dutch links and provided recommendations on how ES can be given a more explicit place in the public and private market mechanisms that govern the tropical timber chain. They did this in the hope that informing decision-makers about the importance of ES will stimulate policies that improve how the ecosystems that provide these ES are managed.

The analysis conducted by Van den Berg *et al.* (2013) is guided by an integrated innovation system and value chain approach comprised of two parts. The first is a discourse analysis of how Dutch policies and practice address ES and the second is an analysis of four specific cases of innovation from within the tropical timber value chain. Each of these case studies describes the history of the innovation and the extent to which ES are explicitly mentioned.

This study uses the same conceptual approach and methodological framework developed and used by Van den Berg *et al.* (2013) to the cocoa, soy and palm oil value chains. These value chains were selected after a review² of the priority products from the Sustainable Trade Action Plan (STAP). The structure of this study is as follows. The remainder of Chapter 1 contains the research questions and research methods. The conceptual approach and methodological framework are outlined in Chapter 2. Chapter 3 contains an updated version of the discourse analysis conducted by Van den Berg *et al.* (2013). The Chapters 4, 5 and 6 present the case studies from the cocoa, soy and palm oil value chains. Chapter 7 refers back to the research questions and discusses the key findings, making recommendations for how ES can be more integrated into Dutch policy and practice. A comparison of the findings of this study and those of Van den Berg *et al.* (2013) is also made, highlighting similarities and differences between the various value chains considered.

1.2 Aim and research questions

The aim and research questions for this study are the same as those that guided the work of Van den Berg *et al.* (2013). The aim is to explore the governance options available to the Dutch government for the promotion of the sustainable use and maintenance of ES in tropical commodity value chains

¹ 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.

² This review was carried out in consultation with the TEEB steering group.

with Dutch links and how ES can be given a more explicit place in the public and market mechanisms that govern these tropical commodity value chains.

Working within the framework promoted by the International TEEB cascade approach, shown in Figure 1, this study aims to provide insight into how the feed-back process (between value perception and ecosystem management) can be influenced to take ES better into account. Triggers, barriers, stimuli and other contextual factors or framework conditions for relevant decision making platforms/arrangements are identified. The governance options and policy instruments available to the government to take ES better into account are identified (see 1.12.7 for details on the methodological framework).

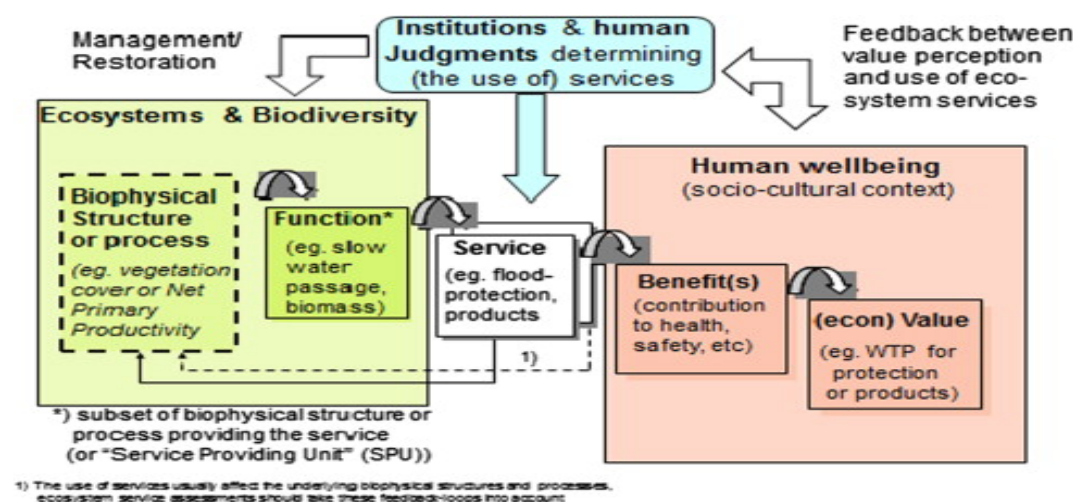


Figure 1: Ecosystem services. Source: (Braat and De Groot 2012)

The underlying goal of this study is to assess whether there are 'wins' to be gained for chain sustainability by understanding and improving the integration of ES. The concept of sustainability implies that ecosystem services are maintained or conserved despite being used and in some cases commoditised (Van den Berg *et al.* 2013). In consultation with PBL, Van den Berg *et al.* (2013) proposed the following five questions, which are also the focus of this study.

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

To answer these questions, Van den Berg *et al.* (2013) developed a conceptual framework. The framework is guided by innovation systems and a value chain analysis. Using this framework this study presents an in-depth analysis of four cases of innovation from across the cocoa, soy and palm oil value chains. The case studies aim to answer the following four sub-questions, which are again the same as for the cases considered by Van den Berg *et al.* (2013).

1. What is the innovation relating to ES in the tropical commodity value chains? 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?

Target audience and knowledge requirements

The target audience for this study are policymakers and stakeholders in value chains with a direct link to the Netherlands, also stakeholders involved in conserving, maintaining and using ES impacted upon by international value chains. The study assumes a basic knowledge about ES, tropical commodity value chains, value chain stakeholders and the conceptual frameworks. The governance aspect of ES is still relatively unexplored and thus governance options – for not only the government but for all stakeholders 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 information to improve policy and decision making. This includes information on innovation in the chain with respect to ES, the tools and mechanisms used, the results of these innovations, areas in need of further attention and recommendations.

Scope of the study

This phase of the research represents an expansion of the work conducted by Van den Berg *et al.* (2013). The conceptual framework developed and tested using the tropical timber value chain is now applied to three further value chains, namely cocoa, soy and palm oil. The concept and method has been refined based on the experiences of Van den Berg *et al.* (2013). The scope of the study remains limited to international tropical commodity value chains which have a Dutch connection (i.e. imports to the Netherlands, Dutch consumers or companies). The geographical scope of the study is international, given the nature of value chains and the impacts of value chain operations on ES. The governance possibilities are analysed from the perspective of the Dutch government and its sphere of influence.

1.3 Research methods

This study employed the same methods as those used by Van den Berg *et al.* (2013). The following descriptions of the research methods have therefore been directly taken from Van den Berg *et al.* (2013) with slight adjustments made to include information that is specifically relevant to the value chains considered by this study.

Discourse analysis

To identify the assumptions behind the current and expected roles of different societal stakeholders 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 2.4). By using this perspective, relationships between value chain stakeholders 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 value chain governance. There is a political element to this knowledge, as some lines of thinking (e.g. local knowledge or 'soft' anthropological knowledge) are often ignored. This can be the result of power relationships within environmental narratives.

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 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 realized in this study aims 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. It also shows how Dutch policy makers perceive value chains and ES.

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 commodity chains. Using cases as the main primary data collection method has its strengths and weaknesses in terms 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 commodity 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 (Table 1):

- The case makes reference - in one form or another - to ecosystem services;
- The case is representative of international 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 along a continuum from direct to indirect government involvement and governance, to private sector and civil society governance.

Table 1

Selected innovation cases within the cocoa, soy and palm oil value chains

Chain & case	Driving Actor	Innovation	Learning
Cocoa STAP & UTZ certification	(International and Dutch) Private sector	Includes general ecosystem services in sustainability certification, process orientated	Pilot, multi-stakeholder
Cocoa Payments for eco-system services (PES)	(Dutch) Private sector	Includes specific ecosystem services	Pilot
Soy Round Table for Responsible Soy (RTRS)	(International and Dutch) Private sector Civil Society Public sector	Attempts to include ecosystem services in sustainability certification, process orientated	Pilot, multi-stakeholder
Palm oil Round Table for Sustainable Palm Oil (RSPO)	(International and Dutch) Private sector	Includes ecosystem services in sustainability certification, process orientated	Pilot, multi-stakeholder

Interviews were conducted per case where possible to triangulate the literature and respond to specific gaps in data, and/or clarification. The selection of stakeholders 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, as it was with the study by Van den Berg *et al.* (2013). The interviews do not aim to provide a representative perspective from all parties involved in the chain or case and 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 included in Annex 1. Additional data was collected through a literature review. Grey literature including policy documents, websites, databases, media and press releases were used. For each of the cases, the same structure as that used by Van den Berg *et al.* (2013) was used:

- Stakeholders, 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 ES) 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.

2 Conceptual approach and methodological framework

2.1 Introduction

This chapter outlines the main concepts drawn upon by Van den Berg *et al.* (2013) in the development of the methodological approach and methodological framework used in conducting the analysis of value chain innovation cases in the tropical timber value chain. This chapter, with additions to Section 2.6 on the value chain concept, has been taken from Chapter 2 in Van den Berg *et al.* (2013). This background information has been included, as it allows this document to be read as a stand-alone document.

2.2 Ecosystem services

The cornerstone of the conceptual approach is based on an understanding of ES. 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 in its' 2005 Millennium Ecosystem Assessment (MEA) (Millennium-Ecosystem-Assessment 2005). The MEA grouped ES into four broad categories: *provisioning* (also known as goods), *regulating*, *supporting* and *cultural*, shown in shown in Figure 2.

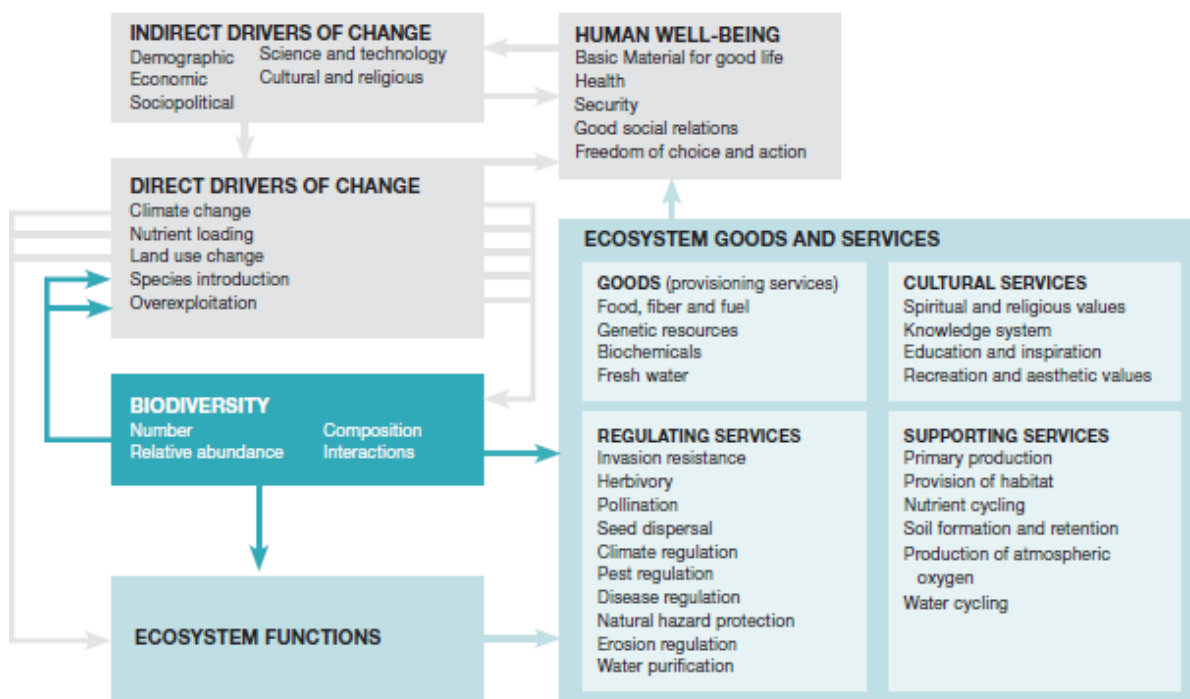


Figure 2: Ecosystem services and drivers of change

Source: Convention on Biological Diversity, CBD³

³ <http://www.cbd.int/doc/bioday/2008/ibd-2008-factsheet-01-en.pdf> retrieved 7 August 2012.

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 ES may be provided as externalities⁴, in that they are unintended consequences of primary land management activities. Many ES have the characteristic of public goods⁵, 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 ES 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%⁶, 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 (Minsitry 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 innovation cases in the cocoa, soy and palm oil value chains presented in Chapters 4 to 6, 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 ES (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 ES 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 ES 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 much debated (Cardinale, Matulich *et al.* 2011).

2.3 The problems and opportunities of addressing ecosystem services

The metaphor of nature as a stock of resources (the 'natural capital') providing a flow of services (the 'capital interest') 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

⁴ 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).

⁵ 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.

⁶ http://www.fao.org/ecosystem_services/esa/pesal/aboutPES2.html# retrieved 7 August 2012.

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 supply 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, Rodrigues *et al.* 2008) has gained enormous ground, with the broadening of TEEB's scientific, business and policy coalitions and partners as a good example. This has increased the visibility of ecosystem services in policy arenas. 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) have 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, Lipper *et al.* 2008, 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 is the extent to which the costs of maintaining ecosystem services cover their social benefits (Fisher *et al.* 2008, Bauhaus *et al.* 2012). One of the reasons for the difficulty of their valuation, use and management is the distribution of costs and benefits among 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".

To make the rights of future generations more clearly, future benefits could/should be taken into account in present day valuation exercises. This is a much debated issue, giving rise to the discussion of what the appropriate discount rate should be in social cost-benefit analyses.

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). There has been increasing (intern)national consensus, evidenced by the adoption and subsequent adherence to the MEA (2005) and TEEB (2008), 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, the incorporation of ecosystem services has been more evident in Dutch policy (VVD CDA coalition agreement 2010), a prime example being the Beleidsprogramma Biodiversiteit 2008-2011.

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). There has been an increasing (inter)national consensus, evidenced by the adoption and subsequent

adherence to the MEA (2005) and TEEB (2008), 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, the incorporation of ecosystem services has been more evident in Dutch policy (VVD CDA coalition agreement 2010), a prime example being the Beleidsprogramma Biodiversiteit 2008-2011.

Another aspect to take into account when discussing the valuation of ecosystem services is the notion of increasing costs of sustainable management. In a study on forest 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 (PWC and IDH, 2012)⁷. One way of tackling this barrier for further growth in sustainably managed forests is the introduction of legality rules (such as for sustainable public procurement and the EU Timber regulation, see van der Berg *et al.* 2013), as that will increase the minimum standard of forest management for all operators. Another way of tackling this barrier can be the valuation of ecosystem services and incorporation of those values in decision making processes.

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 stakeholders, 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 stakeholders 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.

⁷ <http://www.idhsustainabletrade.com/news/eu-sustainable-tropical-timber-coalition-eu-sttc-launched>

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 stakeholders 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). Freeman (1987) focuses 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 stakeholders 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 stakeholders, 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 stakeholders 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

	Technology change	Sustainable technology	Alternative food chains	Knowledge Studies	Farmer-driven, bottom-up	Multi-stakeholder, broker, etc.
Prominent actors/advocates	Research (Callon et al),	policy supporting research (e.g. Schot, Geels, etc.)	Research (e.g. Brunotti, Wiskerke et al.)	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

Source: Almekinders *et al.* (2012)

Innovation platforms use intermediaries or brokers to enhance systems and processes (Howells 2006) by facilitating - intentionally or unintentionally - interactions between stakeholders that would otherwise not connect or connect less effectively. Platforms, as 'spaces' where stakeholders 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, Ellis-Jones *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. The multi-stakeholder school of thought presented in Table 2 is therefore most relevant to this study. But, 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 stakeholders together, making them aware of how their interests are aligned (Te Velde *et al.* 2006, Purnomo *et al.* 2008, Devaux, Horton *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 stakeholders, 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 stakeholders (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 stakeholders (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 stakeholders 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). Multi-level governance concerns the increased complexity, proliferating jurisdictions and increased rise and participation of non-state stakeholders. These phenomena make decision-making a process of 'complex overlapping networks' rather than 'discrete territorial levels' (Bache *et al.* 2004), Transformations in the role of the state have challenged conventional ideas of democratic accountability and of the role of the state and firms in decision-making, of corporate social responsibility, producer responsibility and transparency and sustainable chain management. This has led to three main levels of chain governance (see Figure 3).

Three levels of analysis of supply chain governance

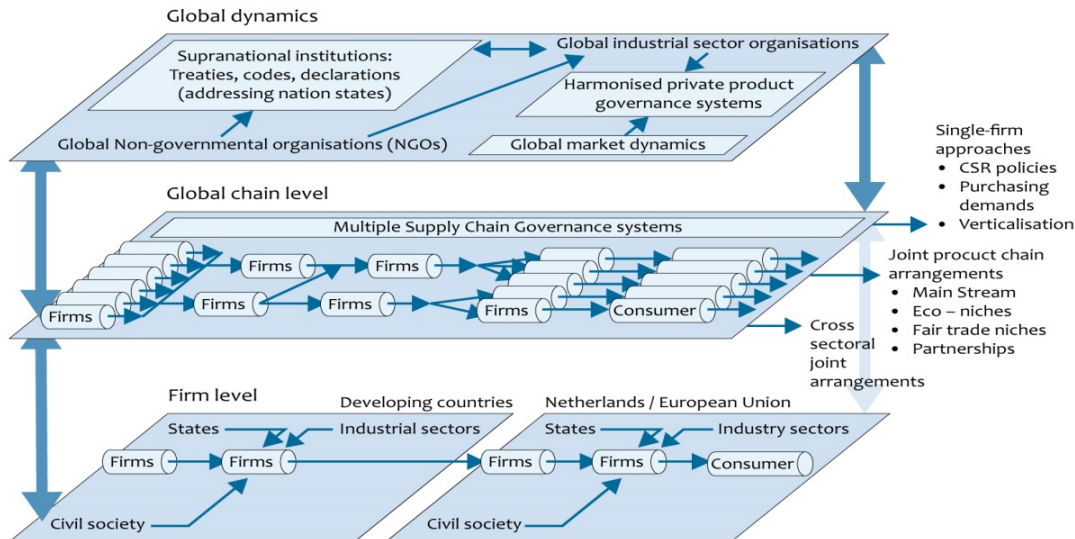


Figure 3 Multi level chain governance . Source: (Vermeulen, Uitenboogaart et al. 2010)

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, Arnouts, Kamphorst et al. 2012). These new and hybrid forms of governance can occur in alliances between public, private and civil society stakeholders. In general governments have four main different policy instruments that can be and are used to influence chain activities, shown in Table 3.

Innovation can occur at all stages of a chain and can be driven by different stakeholders and different configurations of governance arrangements and can be better understood by knowing the position and behaviour of stakeholders in a value chain (Gereffi et al. 2005, Te Velde et al. 2006). For example, lead firms or stakeholders with significant power are able to coordinate and control value chains, depending on the mode of value chain governance (Gereffi, Humphrey 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. Sustainability is used as a proxy for outcomes and impacts of innovations in regard to ecosystem services. A number of studies point to different strategies of innovation in value chains that aim to have positive impacts on sustainability:

- Policies to foster an innovation-enabling environment for enterprises (Weiss et al. 2011)
- Using sustainability as a driver of innovation (Nidumolu et al. 2009)
- Encouraging entrepreneurship (Te Velde et al. 2006)
- Recognising the 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)
- Encouraging product innovation (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, Humphrey et al. 2005)
- Introducing standards and standardisation (Gereffi et al. 2005)

Table 3

Supply-chain governance styles and policy instruments

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

Inspired by Van Tulder 2008, Vermeulen and Kok 2012)

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 under framework conditions) which influences value chain stakeholders;
- The strategies (i.e. business models) stakeholders 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.

As result of changes in political and consumer ideologies about value chain governance, public-private partnerships and interventions on a global, national and regional and level have emerged that aim to promote more sustainable value chains, pursue development and trade goals, sometimes concurrently. International multi-stakeholder examples are the Round Table on Responsible Soy (RTRS) and the Round Table on Sustainable Palm oil (RSPO), both of which aim to facilitate dialogue and have been widely embraced by many policymakers and advocates. Such multi-stakeholder platforms have also been seen as a way of democratizing the governance of such international chains, being more inclusive, consequential and authentic and giving a voice to those with traditionally less power. However there is criticism that such partnerships fall short on their deliberative democracy in terms of inclusiveness (of stakeholders and discourses) and consequentiality (Schouten *et al.* 2012). The sometimes limited role taken by governments, with preference for stimulating self-governance by industry, has led to debates on effectiveness, transparency and legitimacy of these forms of self-governance and the appropriate roles for (national) governments and effectiveness of possible government interventions (Vermeulen and Kok 2012). It is difficult to determine the impacts of such

chain partnerships in complex settings where multiple-causality is possible, particularly whether the partnerships are necessary for the innovation and change processes to occur. Vellema *et al.* (2013) partnerships are (at most) a contributory factor in a wider constellation of factors that generate change.

Addressing ecosystem services in value chains

A conceptual framework that incorporates ecosystems services 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 to track the flows (amounts, revenue, and costs) of products from their source through to the end consumer to assess the social aspects of production and trade by evaluating employment and income diagnostics.

Approaches to examine the sustainability of value chains – notably certification schemes, corporate social responsibility, public procurement, and resource supply risk management and mitigation initiatives – have (sometimes indirectly) addressed ecosystem services (Grigg *et al.* 2009, Soto *et al.* 2011, Weiss *et al.* 2011). The process of creating certification standards has been recognised to have 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).

There are also multi-actor activities addressing how biodiversity is integrated into 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, Kapila *et al.* 2008), the Business and Biodiversity Offsets Program (BBOP), the Biodiversity in Good Company Initiative, and in the Netherlands, the work on Business meets Biodiversity⁸ and Leaders for Nature by the IUCN. The focus on just biodiversity highlights that which range from unorganized and powerless workers to difficulties in product commercialization and undeveloped demand for certified products among businesses and consumers.

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. The conceptual framework shows how innovation is a dynamic process, involving multiple stakeholders, 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 the structure of the innovation system and the dynamics of the innovation processes and how these interact with the value chain stakeholders (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 4.

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

⁸ <http://www.uu.nl/faculty/geosciences/EN/bmb/Pages/default.aspx>

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 stakeholders (individuals and organisations) related to innovation within a shared frame.

Framework conditions, also shown in Figure 4, 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. Included in the process dynamics are access to power and the control of ecosystem services by stakeholders in the value chains. As Figure 4 illustrates, context-related issues provide a range of opportunities for innovation in 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.

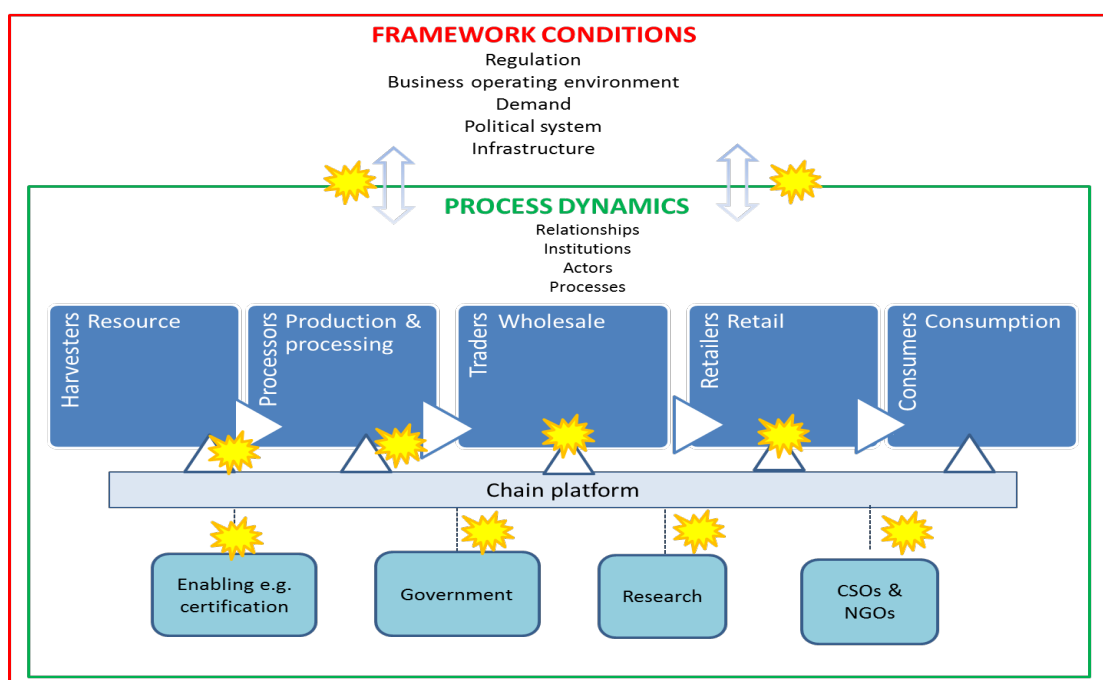


Figure 4: Conceptual framework combining innovations systems and value chains

Note: the yellow stars indicate "innovation windows of opportunity": places and processes in a value chain where innovation can or does occur.

The study concerns the entire chain – represented by a number of main stages, including the natural resource base (fields, forests, plantations and agro-forestry) – its stakeholders and their relationships. Indirect stakeholders include regulators, enabling organisations such as certification bodies, research and development stakeholders, and 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 in the discourses concerning chain operation and governance.

3 Dutch policy discourse on ecosystem services and international value chains

3.1 Introduction

This chapter presents an updated analysis of the Dutch policy discourse on ecosystem services and cross-sector collaboration for sustainable value chains. An additional four policy documents have been added to the seven documents used by Van den Berg *et al.* (2013). A list of these documents is included in Box 1.

Box 1 Dutch policy documents concerning ecosystem services

Documents reviewed by Van den Berg *et al.* (2013)

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 (Ministry of Economic Affairs, Agriculture and Innovation, 2012)
2. Letter of appreciation of the Ministry of EA concerning the European Biodiversity Strategy (Ministry of Economic Affairs, Agriculture and Innovation, 2011)

Policy documents addressing commodity chains and/or ecosystem services:

3. Government Commodity note (Dutch Cabinet, 2011)
4. Government Sustainability agenda, a green growth strategy for the Netherlands (Ministry of Infrastructure and Environment, 2011)
5. Biodiversity Policy 2008-2011 "Biodiversity works for nature for people forever" (Agriculture, Nature and Food Quality, 2008)

Policy documents on governance and collaboration:

6. Background document for the budget of the Ministry of EA 2011 (Dutch House of Representatives, 2011)
7. Government vision on governance and administrative structure (Ministry of the Interior and Kingdom Relations, 2011).

Additional policy documents reviewed in this updated analysis

Policy documents addressing commodity chains and/or ecosystem services:

8. Natural Capital Agenda: conservation and sustainable use of biodiversity (Uitvoeringsagenda Natuurlijk Kapitaal: behoud en duurzaam gebruik van biodiversiteit)" (Ministry of Economic Affairs, 2013)
9. Policy letter "Corporate social responsibility pays off" (Ministry of Foreign Affairs, 2013)
10. Policy Note "What the world deserves: A new agenda for aid, trade and investment" (Ministry of Foreign Affairs, 2013)
11. Report "Dutch international support in the field of climate change" (Ministry of Foreign Affairs, 2010)

The aim of this updated version is the same as Van den Berg *et al.* (2013): to identify the assumptions underlying Dutch policies to increase the sustainability of international trade.

3.2 Ecosystem services: policy area in development

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 is 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 ES in policies, as biodiversity underpins the four categories of ES in different ways (TEEB 2010):7). Awareness of the role of ES in enabling human habitation and economic activity has been increasing with the acknowledgement of the threat posed to the long-term health of ecosystems by human activity. Efforts are being made to make ES more relevant and visible, for example by assigning them a value, to inform decision-makers about the importance of ES and to stimulate policies that improve how the ecosystems supporting and providing them are managed. 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). The ES 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 *et al.* 2013). The ES concept, using catchphrases such as 'making nature's values 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) studies⁹.

In the review by Van den Berg *et al.* (2013) of the content and keywords in seven policy documents, it emerged that the Netherlands did not have a specific policy on ES as of 2013. Up until 2013, the policy document providing the most extensive information on ES was the 2008-2011 Biodiversity policy 'Biodiversity works for nature for people forever', where ES were introduced with reference to the MEA;

"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".

Van den Berg *et al.* (2013) note that while the term biodiversity is explained the term ecosystem services is only briefly explained with 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.*' They note that the relationship between ecosystems and biodiversity is not further addressed. In the policy program on biodiversity for 2008-2011, the maintenance of ES is presented in the ten objectives of the EU Biodiversity strategy 2020. Table 4 lists the priority objectives from the policy program on biodiversity 2008-2011.

The Agenda for Natural Capital (2013) adds to the policy program on biodiversity for 2008-2011 by suggesting that the world's natural capital is under pressure due to the "*over-exploitation of ecosystems and their services, global climate change and the unsustainable use of natural resources*". In both documents ES are positioned in such a way that ES in Dutch policies seems to be an externally driven objective of the EU:

"This agenda takes the international biodiversity commitments of the Convention on Biological Diversity, on which the EU biodiversity strategy is based, as a starting point. This agenda strives, by 2020, to identify resilient ecosystems and ecosystem services that contribute to biodiversity, water and food security, poverty reduction and welfare" (Natural Capital Agenda, 2013).

⁹ <http://www.rijksoverheid.nl/onderwerpen/biodiversiteit/nederlandse-bescherming-biodiversiteit>

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, pal 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

This policy document now makes a clear choice for the simpler term of natural capital, and makes more explicit the link between natural capital (although does not define it) and value chains:

"Sustainability also extends to the conservation and sustainable use of biodiversity. The Natural Capital Agenda complements and supports the Sustainable Trade Initiative activities in the area of sustainable chains.....The chosen themes extends to the conservation and sustainable use of biodiversity. The Natural Capital Agenda complements are: I Sustainable production and consumption: sustainable supply chains" (Natural Capital Agenda p.3)

In their review Van den Berg *et al.* (2013) indicate that the focus on making value chains more sustainable is mainly related to impacts on biodiversity. ES are mentioned in regards to national priority to create markets and are positioned in combination with payment and financing mechanisms: 'the user pays' 'the beneficiary pays'. Van den Berg *et al.* (2013) believe that the way in which ecosystems are positioned in the 2008-2011 biodiversity policy is confusing because of the inconsistent way in which objectives are formulated. Sometimes objectives are only related to biodiversity and other times they are related to ecosystem services or both. They write that it is *"therefore 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, ES are only associated with solutions and actions concerning pricing, while objectives including biodiversity also include conservation and sustainable value chains. This duality must be seen against the fundamental relation between biodiversity and provision of ES, which is not straightforward. There are always certain elements of biodiversity involved, but these may differ per service. Protecting one biodiversity aspect does not automatically lead to sustainable use or conservation of another. Specific strategies are therefore needed per ES or vice versa per biodiversity aspect, something that is not clear from the general policy descriptions.

The Biodiversity Policy Program 2008-2011 further addresses the causal interpretations concerning ES 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. Giving biodiversity a more explicit place in economic and monetary considerations is thereby directly related to poverty alleviation."

Van den Berg *et al.* (2013) suggest that these two quotes indicate that the degradation of ES 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 ES. In the government's reaction to the advice of a multi-stakeholder platform on biodiversity (The Biodiversity Taskforce) it 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 scarcity of biotic and a-biotic commodities. Their problem description is:

"The current market organisations are 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".

The full set of policy documents considered hold on to the idea that ecological degradation is caused by a lack of pricing of environmental externalities. Different interpretations within the various documents relate ES to the achievement of green economic growth, wealth and welfare, an enabling business environment and economic competitiveness. The Commodity Note and the Natural Capital Agenda use the term natural capital. Whilst neither defines exactly what natural capital is, this appears to be a signal that terminology preferences are changing as attempts are made to encourage the further uptake of the ES concept. These documents make a much stronger causal interpretation of the lack of accounting and valuing of ecosystem services due to economic interests, while the earlier/preceding policy program on biodiversity addresses pricing and putting value on ES without mentioning economic objectives such as increasing growth or wealth. These recent developments may be an indication of the phase of ES policy development the Dutch government finds itself in, one that has seen the policy focus move away from creating an awareness of value to elaborating on how this value can and should be captured. This next phase in policy development brings with it the risk of the discussion focusing solely on the monetization of natural capital and becoming too technical while losing sight of the ultimate goal of conserving biodiversity.

3.3 Strong policy belief in market-driven solutions

Van den Berg *et al.* (2013) write in their analysis that the three priority objectives in the Biodiversity Policy Program 2008-2011 are directly related to the economic 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.

Van den Berg *et al.* (2013) find that 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 ES 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 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 the third solution, ES are only addressed under the second. In response to its description of the problem of a 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 ES into the decisions that are taken by the government, the business community and the consumer. Also in this document the scarcity of commodities is framed as an opportunity:

"The scarcity of commodities is seen as an explicit opportunity. The Cabinet wants to stimulate innovation, re-use and substitution so that the Netherlands will play a leading role within Europe. 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."

In the Natural Capital Agenda (2013) the Dutch government identifies a number of themes selected on the basis of advice from the Biodiversity Taskforce. The following passage highlights the government's intentions and lists the themes that have been selected.

"The themes have the intention of promoting both the conservation and sustainable use of biodiversity. The cabinet has reinforced its commitment to strengthening the relationship between the economy and ecology. The selected themes are as follows:

- 1. Sustainable production and consumption: Sustainable chains*
- 2. Sustainable fisheries and conservation of marine biodiversity*
- 3. Sustainable agriculture and conservation of biodiversity*
- 4. Valuing natural capital".*

These themes are accompanied by 16 concrete action points, some of which address ES directly. Action point 5 talks about the need to address conservation in agro-commodity production areas from a landscape level and states that 2 pilot projects will begin in 2014. A landscape approach is suggested as beneficial as it *"provides opportunities to bundle together payments for different ecosystem services"*. Action point 11 describes the rehabilitation of degraded ecosystems. This rehabilitation allows those ecosystems *"to again deliver a wide range of ecosystem services"*. Action point 13 states that *"the Netherlands will conduct a National Ecosystem Assessment. The resulting information on the functioning of ecosystems and the services that they (potentially) deliver will be compiled in a Digital Atlas Natural Capital (DANK)"*. Action point 15 discusses natural capital accounting and the statistical framework agreed upon at the UN in March 2013. This framework is intended to expand current environmental accounting practices with indicators for ES. *"Countries have been invited by the UN to apply the framework in a series of pilots. The Netherlands will apply for participation in the pilots and an update will be provided to the House of Representatives mid-2016"*.

These quotes indicate that the perspectives for ES are clearly market-led, related to valuing, pricing and paying. The investments made in innovation in the sustainability of value chains is seen as a direct interest for securing the import 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 and payment solutions are strongly framed as an opportunity if investments in innovation for sustainable value chains are made. A recent announcement at the Rio+20 summit and on the Ministry of Foreign Affairs website on June 20 2012¹⁰ 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 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

This section looks at how the government frames specific roles and responsibilities for different stakeholders and reflects on its own role in achieving its aspirations. Van den Berg *et al.* (2013) identified a dominant discourse on collaboration and that remains the case after taking the added policy documents into account. As Van den Berg *et al.* (2013) state, this focus on collaboration is justified given the character of the issues being addressed;

"Due to the global character of the commodity issue the possibilities for national policy solutions are limited." (Commodity Note)

¹⁰ <http://www.minbuza.nl/en/news/2012/06/the-netherlands-to-invest-in-natural-capital-accounting.html>

"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 that;

"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 that:

"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 stakeholders and develop public private partnerships. Also, a separate supporting and cross-cutting priority in the biodiversity policy program is "engaging new partners from society". There is no direct role for government. This is illustrated further in the Natural Capital Agenda (2013) in which the government states that it wants to generate awareness of biodiversity in relation to the four themes it mentions by making effective and innovative use of the "networks between government, businesses, social organizations, research and education institutions and citizens". They aim to do this by connecting these networks to "new and demand-oriented knowledge and communication related questions".

In the Commodity Note, the Cabinets response to the advice of the Taskforce Biodiversity and Natural Resources, the Dutch agenda for sustainable growth and the more recent policy note "What the world deserves" the Dutch government clearly pushes the business sector forward as the leading party;

"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)

"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)."

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 position 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 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 provides the most recent and concrete description of the role, responsibilities and tasks related to ES 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 ES 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 ES and sustainable value chains to be developed in the future.

In the vision of the Ministry of EA, the policy framework for ES is still under development. As Van den Berg *et al.* (2013) noted the Ministry had the aim of developing, in 2013, an indicator that reflects the economic significance of nature/biodiversity for society in terms of the share of ES incorporated into the Dutch GDP. While not yet developed this remains the aim, as reiterated in the Natural Capital Agenda. Besides this, the Ministry would still like to invest in the creation of markets for ES such as CO₂ storage, water storage, recreation and health, which are currently provided by nature ‘free-of-charge’.

The government aims to do a feasibility study on opportunities for market mechanisms for ES 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 Deals¹¹ between businesses and knowledge institutes: where the government invites business and knowledge institutes to develop initiatives in support of green growth, sustainable value chains and biodiversity. The green deals create experimental space, support and give exposure to inspiring projects, can remove unnecessary (legal) hindrances, and may where necessary propose stimulating legal instruments, to make innovations and markets for ecosystems possible and knowledge development and dissemination. Examples are the Implementation Agenda for Natural Capital (*Uitvoeringsagenda Natuurlijk Kapitaal*) from June 2013 which aims to maintain biodiversity, the Green Deal for Concrete (Green Deal Concreet 1.0) in the cement sector¹² and about soil¹³.

¹¹ <http://www.rijksoverheid.nl/onderwerpen/duurzame-economie/green-deal>.

¹² http://www.strukton.nl/global/groep/documenten/nederlands/downloads/green_deal_beton_concreet_1.0.pdf.

¹³ [http://www.skbodem.nl/download/1435/7890skbdoorground\[nr5def.pdf](http://www.skbodem.nl/download/1435/7890skbdoorground[nr5def.pdf).

- A multi stakeholder platform coordinated by IUCN and VNO/NCW on businesses, biodiversity and ecosystem services.
- Support for the Sustainable Trade Initiative (*Initiatief Duurzame Handel*, IDH), by creating co-financed public-private partnerships
- The Dutch study on The Economics of Ecosystems and Biodiversity (TEEB)
- Support (from EZ) for the Business meets Biodiversity conference (Vollaard *et al.* 2012)

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

Based on the documents in Box 1, ES is positioned in Dutch policy as both a global, European and national issue, by referring to the MEA and ES in global and European objectives. Biodiversity is more frequently mentioned than ES. The concept of ES is not explained and it remains unclear why certain policy objectives relate only to biodiversity and not to both biodiversity and ES. ES 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 ES into market prices (common goods). This contention has led to a focus on economic measures as the solution to conserve and maintain ES.

Sustainability challenges for business are framed as an opportunity to strengthen the Netherlands' competitive position, particularly in the recent policy documents emerging after the 2008-2011 biodiversity program. A dominant discourse has emerged 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.

The Dutch policy discourse on sustainable value chains and ES can thus be summarized as having an economic basis:

"Ecosystem services are 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."

The following concepts guiding the governance of sustainable value chains and ES can be deducted and are listed below so as to make them more explicit:

-
1. The concept of ES is used to integrate economy and ecology with a dominant economic view of the value of nature/biodiversity.
 2. A strong belief and underlying assumption in the ability of (voluntary) market mechanisms to integrate and secure natural capital/ecosystem services in business and chains in cooperation with business and civil society organisations.
 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 ES will be met by maintaining an open trade economy and creating space for business stakeholders 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.

This political stance also reflects long term transitions in Dutch (Elzen *et al.* 2004) and environmental policy (Keijzers 2000) from neoclassical economics towards a greener macro-economy embracing energy, land use, trade and consumption. This Dutch policy discourse therefore closely mirrors trends in other Western, developed countries towards multi-actor governance of sustainable value chains (Vermeulen and Kok 2012).

4 The cocoa value chain

4.1 Introduction

This chapter introduces the cocoa value chain and presents two innovation cases. It uses the methods and concepts introduced in Chapters 1 and 2 to answer the four research questions. The analysis is focused on understanding how ES are dealt with within the cocoa value chain, what the signs are of uptake in chain governance and how learning processes are evolving so that they can be better used to further integrate ES into the chain.

4.2 The cocoa value chain

4.2.1 Background

Seeds of the *Theobroma cacao* tree are a perennial tropical cash crop and non-staple food, used to make cocoa powder, butter and liquor, the main constituents of chocolate. The cocoa value chain has been well documented showing the key role that the Dutch private, public and non-profit sectors play (see (Beukering *et al.* 2013). The majority of cocoa is produced on small farms between 1.5 to 5 hectare, with different reports of average farm size of 2.8 ha (Alonghi 2011) to 3.7 ha (KPMG 2012). Farms generally have low and decreasing productivity rates of 300-500 kg per ha (Ruf 2007; Oxfam International 2009; KPMG 2012). Most cocoa farmers are not organised in cooperatives, infrastructure is lacking, as is finance for inputs and the replanting and regeneration of cocoa trees.

Global demand is expected to increase with world population growth and increasing wealth. With demand forecast to outstrip supply, grinders and confectionary companies face high competition for beans. In 2011 the main consumption regions were in Europe (1,795,000 tons), North America (912,000 tons), South America (342,000 tons), Asia including India (283,000 tons), Japan (155,000 tons), and Australia (65,000 tons). Demand has been steadily increasing in developing countries and in emerging economies such as China. European average consumption is 2.3kg per capita, topped by the Germans, British and Swiss consuming on average 11kg annually¹⁴, with the Dutch consuming on average 2.52 kg in 2007/2008 (Felperlaan *et al.* 2010).

In 2012 4,312,000 tons of cocoa was produced globally (ICCO 2013), 71% originating from Africa, mainly West Africa (Ivory Coast and Ghana), 17% from South America and 13% from Asia – particularly Indonesia. The market has grown since the 1960s, when 1,002,000 tons was produced, doubling to 2,331,000 in 1990 and 3,941,000 tons in 2011 (Cocoa Barometer 2012). The Ivory Coast has consistently been the world's largest cocoa exporter since 1980s and has produced between 41% to 60% world supply in the last three years (ICCO 2013). This generates 15% of GDP and 30% of national export income. However supply shortages are apparent due to a combination of factors such as decreased productivity due to the old age of the majority of West African trees, declining farmer populations, pests and diseases, and climate change (Cocoa Barometer 2012).

The cocoa value chain is characterised by farmer sales to individual traders or cooperatives, who sell to traders or major exporters. These then sell to major confectionary and production companies such as Mars, Mondelez and Nestle or are further processed into food and cosmetic products (Abbott *et al.* 2005), shown in Figure 5. The industry is dominated by eight processors (Blommer, Ecom, ADM, Barry Callebaut, Armajaro, Cargill, Olam, Petra Foods) which had 77% of global market share in 2011 and four manufacturers (Mars, Ferrero, Mondelez and Nestle) which had 20% global market share in

¹⁴ <http://thecnnfreedomproject.blogs.cnn.com/2012/01/17/who-consumes-the-most-chocolate/>. Retrieved 1 March 2014.

2011. Farm gate prices are generally low compared to the value-adding process and profits made on semi-processed and final products. Cocoa production continued to rise despite low prices in the mid-2000s.

The Netherlands plays a key role in the chain, as all the major 'origin' countries export to the Netherlands, in 2010 over 25% of the global production (see Figure 4.3 in Beukering *et al.* (2013) was exported via Amsterdam (Laven and Pelders 2010), with most trading-storing-grinding occurring in the Zaanstreek, near Amsterdam. Around 25% of these beans are re-exported to Germany, Austria, France, UK, Belgium and other countries. The remaining 75% is processed in the Netherlands into butter, powder, cake, paste and liquor. Over 25% of the global cocoa processing industry is based in the Netherlands (Laven and Pelders 2010), home to two of the biggest grinders, ADM and Cargill (Felperlaan *et al.* 2010) and others such as Dutch Cocoa/ECOM and Jan Schoemaker B.V. The Netherlands therefore has an interest, position, and responsibility to play an innovative role in sustainably producing this key raw material.

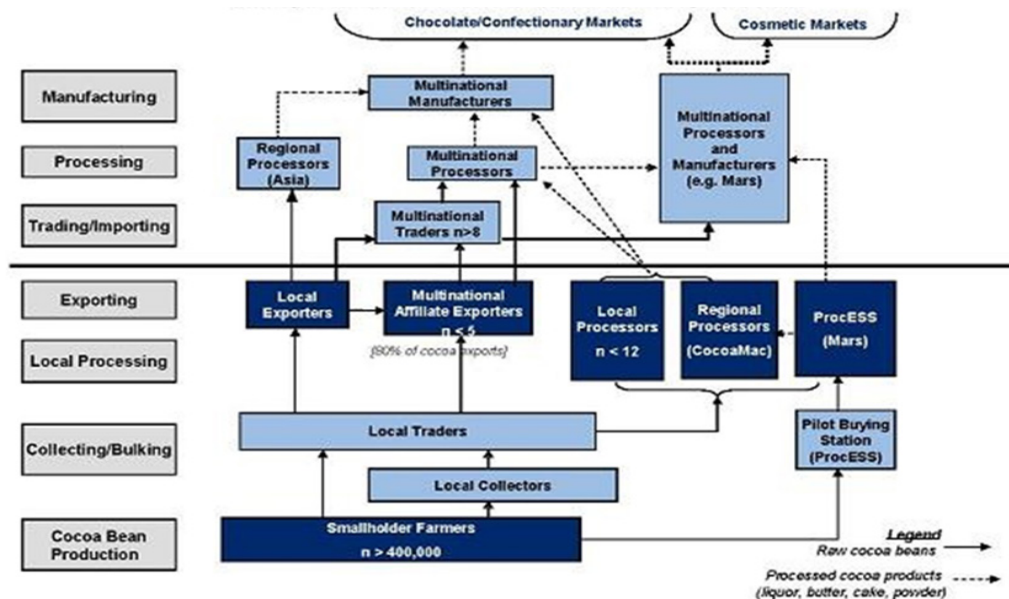
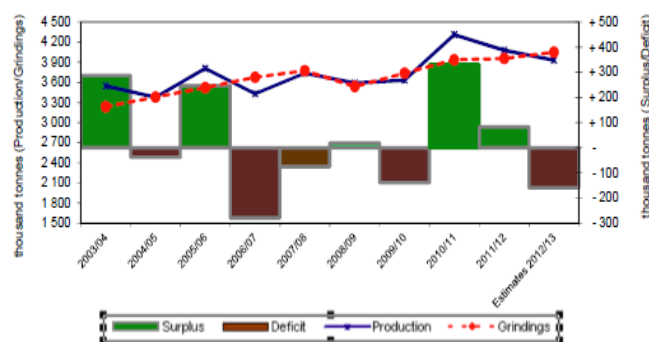


Figure 5: Outline of the cocoa value chain. Source: Adapted from (Panlibuton and Lusby 2006)

In the past the governance of production and quality aspects, input credit and supply, extension services and market infrastructure has often been state-controlled in the cocoa producing countries. Public bodies in producer countries used globally-recognised quality standards and territorial (ecological and technically based) reputations to enhance their position in the global market. However, producing country governments have gradually lost their ability to manage the international cocoa market and shape their own domestic markets. Since the late 1990's market-based corporate governance and price negotiation system has developed in many production countries with the breakdown of national institutions, failed cocoa harvests and pressure from the World Bank and IMF for economic structural adjustment. Foreign companies used the room to increase investments and increase their integration¹⁵ and position in the chain. Exporters (including major trading houses such as Cargill, Barry Callebaut, Olam and Armajaro) were then free to buy and sell based on London market price. The fully liberalised system has left farmers exposed to the international cocoa price set in London. This resulted in reforms to the sector in Ghana and Ivory Coast in 1999 and 2012 respectively, including privatising buying and setting minimum export prices. These institutional changes have created space for innovation, particularly different relationships among organisations in the chain.

¹⁵ Horizontal integration is a strategy where a company creates or acquires production units which are similar - either complementary or competitive. Vertical integration is where activities up and down a value chain is owned by that company. Often each organisations in a chain produce or engage in different product or market-specific activities in a chain.

There have been changes in virtually every dimension of international cocoa value chains (Wilcox and Abbott 2004). In major producing countries such as Ivory Coast, Ghana, Indonesia and Cameroon until 1990 exports, market power and price setting was shared between exporters and the government (Ton *et al.* 2008). Credit, pricing, export licensing and consumer behaviour are now largely determined by the private sector. Although there has been an overall 10% increase in production from 2003 to 2013 (ICCO 2013), shown in Figure 6, sufficient quality supply has increasingly become an issue due to increasing demand (FAO 2007, Eberhard Krain 2011)¹⁶. Supply variability is due to large annual fluctuations, caused by multiple factors, particularly the weather. Quality has generally been increasing, due to training, increasing use of drying equipment and market and regulatory standards. This focus on improving production and climate has had implications for how environmental impacts and ecosystem services are perceived.



Source: ICCO Quarterly Bulletin of Cocoa Statistics, Vol. XXXIX, No. 4, Cocoa year 2012/13

Figure 6: Global supply and demand: cocoa production and grindings 2003-2013
Source: ICCO, 2013

The terms 'hot chocolate' and 'bitter aftertaste' have been popularised in the media and as part of campaigns to demonstrate the imbalances between consumers enjoyment of chocolate at the expense of producer's livelihoods and the environment. The combination of fluctuating markets and prices, declining productivity, crop damage from pests and disease, persistent poverty among farming communities, health and environmental problems, reliance on small holder growers in mainly lower and middle developed level countries where prices and practices affects workers' rights and working conditions, slave and child labour (Eberhard Krain 2011; Alonghi 2011; Tulane University 2011, Ton *et al.* 2008; Kucera and Sarna 2004), conflicts (Global Witness 2007, Guesnet *et al.* 2009) and environmental impacts (deforestation and agricultural practices), have created a situation ripe for innovation which has affected the dynamics of the chain and how organisations relate to each other. As a result of consumer and NGO pressure in consumer countries, many multinational corporations have made investments with a dual aim of improving corporate social responsibility and securing supplies (Abbott *et al.* 2005). This has often occurred due to prodding and lobbying from environmental and socially minded stakeholders, leading to many partnerships of government agencies, NGOs, processors (e.g. Mars, Blommer) and traders, with joint programmes to increase productivity, quality, and social and environmental issues, many of which indirectly address ecosystem services. So much so that worries about 'adding-up problems' have been voiced (Gibbon 2004).

Sustainability initiatives have been supported at sector and industry level by trade associations such as World Cocoa Foundation (WCF) and governmental associations such as the International Cocoa Organisation (ICCO). Innovations, often linked to certification and the organisation of producer groups, have occurred in the ways in which services are delivered to smallholder farmers by especially by buyers, manufacturers, and sometimes joining forces with government extension agents and NGOs and research institutes.

¹⁶ See for example <http://www.cocoa-solidaridad.org/scarcity>, <http://www.nbcnews.com/business/warning-cocoa-shortage-rising-prices-threaten-chocolate-bars-8C11418435>, <http://www.eufic.org/article/en/food-safety-quality/farm-to-fork/artid/sustainable-future-cocoa/>. Retrieved 1 March 2014.

In specific response to aforementioned the challenges and issues in the chain, certification has grown in the last decade. UTZ Certified, Rainforest Alliance, Organic and Fairtrade are the main certification schemes vying for dominance. All are based on codes and standards such as Good Agricultural Practices (GlobalGAP) and the Sustainable Agriculture Network (SAN). The ISO CEN TC 415 standard on sustainable and traceable cocoa is a new standard in development, which could turn out be a combining force, or a competing scheme to the existing ones. These certification schemes take into account ecosystem services differently, all having slightly different focuses on environmental aspects, production quality and quantity (explained further for UTZ in Table 5). World production of certified cocoa beans has grown to 11% of total production in 2011 (Cocoa Barometer 2012). However, globally, only 55% of beans which are certified are sold as certified at retail level and 30% find other sales channels (VOICE Network 2012).

4.2.2 Ecosystem services and the value chain

There are complex relationships between cocoa production and ecosystem services, with both costs and benefits associated with carbon fixation, fertilisers, pesticides and deforestation. Different production models (large or small scale, certified or conventional) have different impacts on soil quality, pest control, weed prevention and pollination, affecting productivity and also worker health and safety. No references were made in the literature reviewed to ecosystem services concerning cocoa processing and production relating to the Netherlands. The main focus in the literature is on ecosystem services related to farmer production (Bisseleua *et al.* 2009, Norris 2010, Agidee 2011, Lambooy and Levashova 2011, BACP 2012). A life cycle analysis of cocoa by The Sustainability Consortium found that that 11 out of 12 key indicators concerned environmental and social issues at farmer level, the 12th is energy use during processing (The Sustainability Consortium 2013).

Waarts and Kuit's (2014) study of the costs and benefits of certification highlights that benefits cannot be solely attributed to certification, as when farmers were part of a contract farming scheme, they received technical assistance. Certification provides an incentive to produce high quality cocoa (through improved post-harvest practices) due to payments when a minimum quality requirement is met. The study found that transparent certification schemes increased farmer's incentive to deliver high quality cocoa compared to non-certified farmers without a contract.

Beukering *et al.* 2013 compared the financial costs and benefits of certification and conventional cocoa for large and small scale farmers, and found that from a purely financial perspective, the benefits of certification outweigh the costs for large-scale (the benefit cost ration (BCR) increases from 2.3 to 2.6) and small scale farmers (the BCR increases from 1.8 to 2.2). From a social perspective, the cost of certification is compensated by societal benefits for small farmers (the BCR increases from 0.8 to 1.2). The BCR for large scale producers remains unchanged at 1.4. As the vast majority of cocoa farmers are smallholders, the impacts from a social perspective are potentially much larger when the social costs are accounted for. These are mostly carbon benefits with global impact, not specifically benefitting locally farmers.

'Fine flavour' and 'speciality cocoa' products currently constitute about 5% of market. These niche products are based upon the specific ecosystem services (climate, soils, genetic variety etc.) which make cocoa beans in certain regions unique, such as in Ecuador, Papua New Guinea, Trinidad & Tobago and Venezuela.

4.2.3 Process dynamics

This section analyses the dynamics of processes in the cocoa chain by examining the stakeholders involved and their relationships, the institutions governing the chain and the processes used to do this.

Relationships between stakeholders are shown in the rectangles in Figure 7. As well as those directly involved, organisations are indirectly involved in lobbying for changes in the chain. These include national governments, bilateral organizations (such as Swiss Contact, the German International Cooperation Agency GIZ and the Dutch Ministry for International Cooperation (DGIS), multilateral

organizations (FAO), institutes and associations, national and international industry associations (WCF, ICCO, CAOBISCO, ECA, COPAL etc.), national government agencies (i.e. CCC in Ivory Coast, COCOBOD in Ghana), nature protection, conservation and human rights organizations, certifying organizations (UTZ, Rainforest Alliance, FairTrade, Organic), and independent auditors and national and international research organizations (Universities, IITA, ICRAF etc.).

Dynamics have changed with the growth in certification, moves away from spot markets to longer-term supply contracts, from country-based to supplier-based risk assessment, and due to coalitions amongst chain stakeholders. Relationships between stakeholders can be characterized according to the following aspects.

Degree of strategic alignment

- Vertical collaborations between producer organisations, traders, local buyers and international traders, and manufacturing companies.
- Little of vertical integration towards farmers, although some farmer tasks e.g. fermentation, are being taken over by processors to increase quality e.g. CEMOI.
- Consolidation of the chain and agglomeration in the last decade as major buyers such as Mondelēz buy out smaller processors and Ecom buying Armajaro.

Trust, cooperation and commitment

- 'Loyalty' of farmers and their cooperatives to buyers and traders in competitive national markets.
- Certification and corporate programs are used as a way of binding farmers and cooperatives to buyers, both informally and contractually, in exchange for services and inputs and via the certification premium payments.

Power and dependence

- Governments in producing countries have tried to reassert power by changing prices and export markets – especially Ghana and Ivory Coast, to ensure that volatile world market prices are also borne by exporters and processors.
- Buyers are dependent upon small holder buyers and vice versa: none of the big manufactures or processors have their own farms. National governments (See Fig 4.2 in Beukering *et al.* 2013) are also dependent upon exports as a major source of state revenues.

Extent of opportunism

- The four main certification schemes named above compete for market share and companies joining their scheme. Producers and their groups have been opportunist in becoming multiply certified, allowing them to sell certified cocoa to different schemes and access premiums.

Conflict and its resolution

- Conflict continues to exist between NGOs and consumer organisations, and major processors and brands about the environmental and social credentials of cocoa, even once certified¹⁷.
- Some farmers do not understand or appreciate the affect campaigns (such to reduce child and slave labour) aim to have on their daily cocoa farming practices. In response campaigns have been initiated about labour rights by national governments and NGOS, and the topic has been being included in farmer training as part of corporate responsibility initiatives and certification.

4.2.4 Framework conditions

Cocoa farms globally, but particularly in West Africa, generally have low and decreasing productivity rates compared to other cocoa producing countries of 300-500 kg per ha (Ruf 2007; Oxfam International 2009; KPMG 2012). Around 6% of the national territory under cocoa production, the majority grown in very suitable growing areas – but not all (Läderach 2011). Expansion into unsuitable areas without fertilisers or goods, adapted agricultural practices commonly results in low yields (Ruf and Agkpo 2008). Annual weather patterns and climatic changes have a significant influence on yields (Zuidema *et al.* 2005).

¹⁷ See for example Oxfam's Behind the Brands campaign <http://www.behindthebrands.org/en/campaign-news/women-cocoa-roadmap>. Retrieved 2 March 2014.

Within the cocoa sector concerns have arisen in the last decade about child labour (Eberhard Krain 2011), slave and migrant labour (Alongi 2011, Ton *et al.* 2008, Tulane University 2011). As the media, NGOs and consumer organisations have brought these issues to the attention of consumers, companies in the chain and producer country governments; this has triggered innovations in terms of partnerships and activities to resolve these complex issues.

The role that Dutch-based organisations play in the cocoa chain, the high consumer interest and concerns about the economic, social and environmental sustainability of commodities, led to the Sustainable trade Action Plan (STAP). Ambitions to enhance sustainability of the sector were concretised in Dutch policy by the signing of a Letter of Intent for Sustainable Cocoa on 4 March 2010. By the end of 2013, 43 private sector, NGOs, and two government ministries had committed to meet a 100% 'guaranteed sustainable cocoa'¹⁸ consumption goal in the Netherlands by 2025. The Letter of Intent is not a regulation and as a voluntary policy agreement, is not binding. Monitoring of the progress is conducted by the ChocoWerkGroup through data collected by industry associations¹⁹ supported with analysis from consultants and institutions such as LEI. There are no references made to ESS in the STAP.

The Dutch regulatory framework regarding cocoa focuses primarily on consumers (i.e. quality, ingredients and labelling of chocolate and cocoa products), and is based on EU based standards²⁰. Other regulations relevant to ecosystem services, such as air and water are not cocoa specific and relate to environmental impacts on these services during processing and transport i.e. EU regulations on waste water emissions and waste emissions from ships.

Whilst the sector is highly competitive, making exchange of commercially confident information difficult, there is a high level of exchange, collaboration and coordination concerning (voluntary) sustainability and CSR goals (which concern ecosystem services implicitly) through the industry associations named above. Most Dutch players are also active in international bodies such as the World Cocoa Foundation (WCF) and International Cocoa Organisation (ICCO), which steers the International Cocoa Agreement, working towards a sustainable (social, economic and environmental) cocoa economy. This has increasingly created an institutional environment where partnerships are possible.

The combination of history, the high specialisation and presence of many organisations is one of the main reasons that the Netherlands forms a geographic hub in the cocoa value chain (Laven and Pelders 2010). The specialised transport infrastructure, progressively upgraded since colonial times, focuses on Amsterdam port, chain management and road network to processors and manufactures.

4.3 Cocoa value chain innovation cases

This section presents the in-depth analysis of two cases of innovation: the IDH program and UTZ certification of cocoa and a payments for environmental services (PES) project (see Section 1.3 for the selection criteria), using the structure and four research questions indicated in Chapter 2.

¹⁸ Guaranteed sustainable cocoa is based on RSCE 2 / 7: Draft Principles for a Sustainable Cocoa Economy. "Guaranteed" emphasizes that these principles have been actioned in an internationally proven and externally verifiable way, which includes the Rainforest Alliance, UTZ Certified, Organic and Fairtrade certification. The Letter of Intent focuses on the Dutch chocolate confectionery market, expressed in cocoa bean equivalents for 5 categories of products defined by 'Studiecentrum Snacks en Zoetwaren Benelux'.

¹⁹ Royal Dutch Coffee and Tea Association (KNVKT), Dutch Food Retail Association (CBL), Organic Producers and Trade Association, Promotion Agency Organic Specialty Store (VBP/PBS), Dutch Association for the Bakery and Confectionery Industry (VBZ).

²⁰ European Cacao and Chocolate guideline 73/241/EEC implemented in the Nederlandse Warenwetbesluit Cacao en Chocolade which implemented revisions in the EU Guideline 2000/36/EG, and the Dutch standard NEN 1229 (Cacaoboter, handelskwaliteiten en eisen).

Each case is introduced, followed by a discussion of these questions, the opportunities for expansion and the extent to which ES are explicitly mentioned, the framework conditions and the dynamics in the chain. Also examined is the role of and policy instruments applied by the Dutch government and ways in which the sustainable use and management of ecosystem services can be further integrated into the value chain, and a conclusion on ways forward.

4.3.1 Innovation history

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. They proposed to combine forces to work on the sustainability of commodities. This resulted in Sustainable Trade Action Plan (STAP). The STAP is coordinated by IDH. IDH 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 commodities, including cocoa. The programs are 1:1 match funded by private companies. The role of the government is indirect but strong as IDH implements Dutch government policy. This innovation has two major facets. One is bringing together the main Dutch stakeholders in the cocoa chains to increase the sustainability of trade. The second concerns the method of financing.

Whilst ES are not explicit in the STAP, because of the use of certification as one of the market transformation approaches, there are many implicit references to ES (shown in Table 5). The most significant innovations have occurred at the beginning and at the end of the chain. As farmers need to initiate the process of certification, the most involved stakeholders are their producer groups, followed by the others in the chain of custody. Enabling organisations (certification standard bodies, auditors, and NGOs supporting certification processes such as Solidaridad) have been very active in increasing the supply and stimulating demand for certified cocoa. Consumers, by purchasing certified cocoa, are important drivers of certified cocoa, in turn depending upon certified cocoa products being made available. The segments and stakeholders in the chain most implicated in the innovations described in this section are shown by the larger innovation 'stars' in Figure 7.

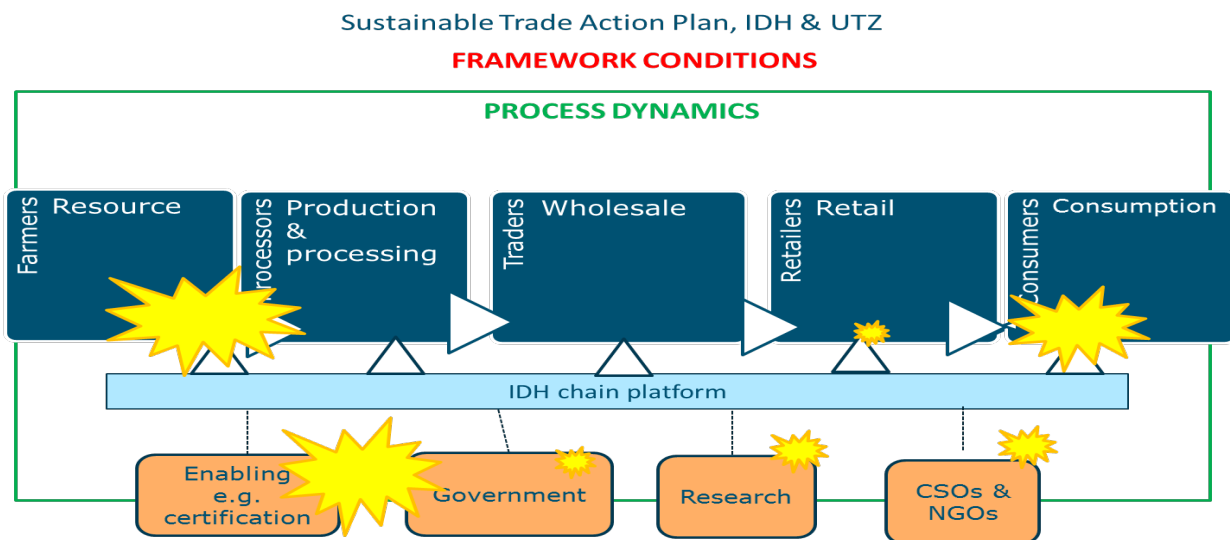


Figure 7: Innovations in the cocoa chain by STAP, IDH and UTZ

**The yellow stars show places and processes in the chain where innovations have occurred.*

IDH's Cocoa Improvement Program (CIP1) was a public private partnership 50% funded by IDH, running from 2008 to 2012. It convened and aligned parties accounting for approximately 30% of the chocolate market and focused on the largest producer countries: Cote d'Ivoire, Ghana, Indonesia, Nigeria, Cameroon and Ecuador. The CIP1 aimed to upscale UTZ Certification, increase market demand for certified chocolate, institutionalize sustainability in the sector, and uses different processes to disseminate innovative sustainability practices (see Section 4.3.3 on learning processes). A second tranche of funding set up the four year Cocoa Productivity and Quality Program (CPQP) starting in

April 2011, which aims to mainstream the results of the CIP1 and stimulate innovations on effective farmer support and improved production. The CPQP provides 7 million euro of co-funding for projects which advance cocoa quality, productivity, professionalization of farmers and their organizations, total quality standard systems, and align private and public sector stakeholders in sustainable cocoa production. The CPQP seeks to train more than 50,000 farmers and certify over 30,000, to produce over 64.000 tonnes of certified cocoa and make certified cocoa available in the international market (IDH 2012). The CPQP brings together more partners to cover over 40% of the worldwide cocoa processing industry and 30% of worldwide chocolate manufacturing businesses, local governments and other stakeholders. Alongside UTZ Certified and Solidaridad, participants include Ahold, ADM, Armajaro, Barry-Callebaut, BT Cocoa, Cargill, Continaf, Ecom, Ferrero, Friesland Campina, Mars, Heinz, ICCO, Nestlé, Swiss Contact, Oxfam Novib, Petra Foods (Delfi), UNDP, WCF and WWF.

UTZ is a program and label for sustainable farming worldwide. UTZ's mission is to create a world where sustainable farming is the norm, and where farmers implement good agricultural practices and manage their farms profitably with respect for people and planet, where industry invests in and rewards sustainable production and consumers can enjoy and trust the products they buy. In 2007, UTZ Certified launched its cocoa program with founding members Cargill, Ecom, Heinz, Mars, Nestle and Ahold and not-for-profit organisations Solidaridad, Oxfam Novib and WWF. The first pilots in Cote d'Ivoire started in 2008 and then Ghana. After extensive stakeholder consultation the UTZ Certified Good Inside Code of Conduct for Cocoa was launched in June 2009 (UTZ Certified 2009, UTZ Certified 2009). The Code provides a set of criteria for economic, social and environmental responsible production sets standards (criteria and control points) and provides guidance and facilitation. It is based on ILO Conventions and principles of good agricultural practices (GAP). It covers production practices, cocoa farm establishment and rehabilitation, farm maintenance, soil management and fertilisation, integrated pest management and crop protection and harvest and post-harvest product handling; cocoa community's health and safety production practices and workers' rights; natural resources and biodiversity protection and maintenance. Responsibilities for implementing the Code of Conduct, controlling product and social responsibilities are outlined, as is the structure and contents of the internal control system (ICS). Whilst ecosystem services are not specifically mentioned in the code, many are implied, shown in Table 5.

The UTZ Certified Code of Conduct for Cocoa applies to organized groups of smallholder producers producing and selling cocoa as UTZ Certified. Certification is required to be carried out by a certification body, which is approved by UTZ Certified. A 'certificate holder' refers to the entity responsible for implementing and monitoring the requirements of the Code of Conduct. The certificate holder applies for group certification and is responsible for the management of an ICS. UTZ Certification requires that progress in meeting these criteria is demonstrated as part of a management cycle, internal control system and auditing. The standard is tolerant for a low level of entry by producer groups, as the number of minimum compliance requirements increases over a four year period. Internal and external auditing of compliance with the criteria occurs at multiple levels, with a web based traceability system.

The Code of Conduct for Cocoa speaks of 'producers', referring to persons who represent their farms towards the certificate holder and have responsibility for the products sold by the farm. With an UTZ Certified certificate cocoa producers can demonstrate good agricultural practices, efficient farm management and responsible production of their cocoa. For cocoa traders and processors the UTZ Certified certificate provides an assurance of responsible cocoa production which can be used in their sourcing decisions and by retailers in marketing and informing buyers of products containing UTZ Certified cocoa. UTZ Certification is implemented mainly through partnerships with traders and processors, whom themselves have partnerships with producer groups from which they purchase beans, aiding them to obtain and maintain certification, for example by grouping farmers and aiding registration, providing training, auditing on GAP (often combined with training on quality and productivity and social aspects such as healthcare and schooling), logistical and technical support and often associated inputs (credit, fertilisers, crop protection chemicals etc.).

The volume of cocoa UTZ Certified has grown by over 100%, since the first two cooperatives were certified in the Ivory Coast in August 2009, to partnerships with cooperatives and traders in fourteen

countries and 66 retailers in fifteen countries in Australasia, Europe and Northern America, selling UTZ certified products in 108 countries (UTZ Certified 2014). Many of these partners have facilitated training producers and producer groups on good agricultural, social and environmental practices (GAP) in line with UTZ Code of Conduct. Implementation of better and more sustainable practices is expected to lead to higher and long term productivity, improved quality (better market access and prices), increased efficiency (lower costs per unit of produce), increased income (improved profitability) and improved social and environmental conditions.

Power and control in the IDH STAP lies mainly with business and IDH. Research organisations, civil society and non-government organisations concerned with ecosystem services have less influence.

4.3.2 Triggers and drivers, opportunities and barriers

Consumer concerns about (supported by campaigns and published by the media) have been a trigger for action on cocoa. Consumer willingness to buy certified cocoa products is a manifestation of how consumers have used their purchasing power to influence trade practices (Smith and Barrientos 2005). A 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 and by the government 50% funding of the IDH cocoa programmes. 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 working together with a long term perspective on sustainability, coordinated by IDH²¹, enterprises aimed to continue initiatives set in place during the previous cabinet, ensuring continuity between the old and new policies, and garner political support and finance. By focusing on commodity flows in which the Netherlands has a strong market position, these actions aimed to achieve “win-wins” of contributing positively to the Dutch economy and sustainability. A major driver has been the funding from the government which eases collaboration, technical support and studies.

A major barrier to addressing ecosystem services in the cocoa chain is that the IDH definition of sustainability does not explicitly address ecosystem services. IDH and its partners equate sustainability in chains with certification, mainly at producer level. This is illustrated by interviews and by the statement on their website: “The main aim of the program has been to improve farmers’ production practices through the training on Good Agricultural Practices and linking them to the sustainable cocoa market by means of certification so as to improve their livelihoods”²². The STAP has stimulated certification (specifically UTZ) as the way to achieve sustainable cocoa in the Netherlands. Only indirectly are ecosystem services addressed by UTZ certification, shown in Table 5. The risk of this indirect approach is that if demand for UTZ declines or is not maintained for whatever reason (costs of certification, financial crisis, reputation loss etc.), STAP targets will be difficult to meet and per se, the implicit support for ecosystem services will not occur. Despite a growing number of studies on the impacts of certification (Bass 2001, Blackman and Rivera 2010, Waarts and Kuit 2010, Rainforest Alliance 2011, Anne Tallontire 2012, COSA 2012, KPMG 2012, N’Dao 2012, Romijn 2012, COSA and ISSER 2013, Ingram *et al.* 2013, KPMG Sustainability 2013), There is weak evidence that that cocoa certification benefits ES and biodiversity. A related barrier is the cost of implementing certification (KPMG 2012).

IDH focuses on just one certification scheme (UTZ) as the main way to achieve sustainability, despite there being other schemes (KPMG 2012). Rainforest Alliance (RA) explicitly addresses ecosystem services in its operating philosophy is active in the Netherlands and many CIP and CPQP partners have adopted UTZ and RA. Fairtrade also addresses ecosystems services, but not with a Dutch interest as far as can be ascertained. The ISO CEN TC 415 standard on sustainable and traceable cocoa is being developed together with input from many Dutch organisations (i.e. Maverick Consultants, KIT) and also looks likely to address ecosystem services.

²¹ See Letter to House of Representatives re Sustainable Trade Action Plan 2011-2015 from Joost Oorthuizen, Director IDH, Utrecht dated 24 June 2010.

²² <http://www.idhsustainabletrade.com/cacao-program>. Retrieved 1 March 2014.

Unlike in the IDH Timber case with FSC (see Van den Berg *et al.* 2013), the effect of a strong mandate for UTZ has not hindered competition among schemes. Competition 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 itself to one certification scheme.

4.3.3 Learning processes

There is a strong focus on learning in both IDH and UTZ. Learning has occurred at a chain level during IDH's annual supply chain conference, periodic programme and impact evaluations (IDH 2012, IDH 2013) and through the UTZ certification process (annual audits, evaluations and impact assessments, such as (UTZ Certified 2014)) and as part of UTZ ongoing monitoring and evaluation process (see their webpage²³). However, as the focus is largely on sustainability generally, and not on ecosystem services specifically, specific learning and innovations related to ecosystem services are limited.

4.3.4 Extent to which ES are explicitly mentioned

The term 'ecosystem services' does not appear in either IDH, the CIP1 or CPQP or in UTZ Certification literature. However, nearly two thirds of the different ES mentioned in the MEA are addressed by the UTZ Certification Code of Conduct standards, shown in Table 5. These are all at producer level.

Table 5
Ecosystem services addressed in UTZ cocoa certification

Ecosystem goods & services addressed in the Code	Clarification of how ES are addressed by UTZ Certification Code of Conduct	Article in Code of Conduct
Goods		
Food, fibre fuel	Cocoa is seen as a food source – largely for consumers in developed countries, not in country of origin	-
Fresh water	-	-
Biochemical	-	-
Genetic resources	CIP and CPQP activities have supported access to 'improved cocoa varieties'. This is not an objective or activity in UTZ certification. UTZ requires that the certificate holder should have a program to distribute shade tree seeds or seedlings – which contributes indirectly to maintaining or enhancing genetic resources. GAP include practices to preserve forests and protected areas	3C
Regulating services		
Invasion resistance	GAP include integrated pest management at producer level	1D, 4C
Pollination	GAP include practices to preserve forests and biodiversity at producer level – which can be positive to pollination, although pollination is not explicitly mentioned.	3C
Seed dispersal	-	-
Climate regulation	GAP include practices to preserve forests and protected areas at producer level as protection against weather risks e.g. minimum level of shade trees	3C
Pest regulation	GAP include integrated pest management.	1D, 4C
Herbivory	GAP include practices to preserve forests and biodiversity at producer level e.g. minimum level of shade trees.	3A, 3C
Disease regulation	GAP include integrated pest management at producer level.	1D, 4C
Natural hazard	-	-

²³ <https://www.utzcertified.org/aboututzcertified/monitoring-evaluation>. Retrieved 15 July 2014.

Ecosystem goods & services addressed in the Code	Clarification of how ES are addressed by UTZ Certification Code of Conduct	Article in Code of Conduct
protection		
Erosion regulation	GAP include techniques to prevent soil erosion at producer level.	1C, 3A
Water purification	GAP include practices that lessen negative impacts on water quality (ie pesticide and fertilizer use near water courses) at producer level.	3B
Cultural services		
Education	Certificate holder to stimulate the education of producers and their families at producer level.	6b
Spiritual and religious values	-	-
Knowledge system	Through Internal control system & training, membership of producer group at producer level.	-
Recreation & aesthetic values	-	-
Supporting		
Primary production	GAP aims to increase productivity at producer level.	1A, 1B, 1C, 1D, 1E
Habitat	GAP include practices to preserve forests and biodiversity at producer level e.g. minimum level of shade trees.	3A, 3C
Provision of habitat	GAP include practices to preserve original habitats at producer level, prior to cocoa forests i.e. surrounding forests and to maintain biodiversity, also to increase by the use of diverse shade trees, it 'rewards' or allows (depending on one's perspective) older reforestation by permitting allowing cocoa farms only on land previously used for agriculture in the last 20 years and clearing of primary forest since 2008 years to be certified.	3C
Nutrient recycling	Not explicitly, but GAP include practices for soil management and fertilisation e.g. composting.	1C
Soil formation and retention	GAP include practices for soil management and fertilisation at producer level.	1C
Oxygen production	-	-
Water cycling	GAP include practices to guard against water contamination and use water prudently at producer level.	1C
24 aspects		16 aspects 66%

4.3.5 Role of and policy instruments applied by the Dutch government

Two main types of policy instruments have been used by the Dutch government in this case (see Table 3 of Van den Berg *et al.* 2013). The IDH cocoa programs used 'endorsing' instruments of corporate self-regulation and to promote the uptake of UTZ to meet the goals of the STAP and Letter of Intent. The public-private interactions and platforms of the CPQ1, CPQP and ChocoWerkGroup, provided subsidies (called matching funds) which encouraged uptake and upscaling of certification, providing are examples of 'facilitating' instruments. None have however explicitly mentioned ecosystem services.

Whilst UTZ invited its members, users and stakeholders to develop the Code of Conduct for cocoa, holding an open consultation, the Dutch government was not involved in this process. In contrast, representatives from the Dutch government have been involved in processes convened by the ISEAL

Alliance²⁴ to develop codes of good practice, on impact evaluation, credibility principles and assurance of certification and accreditation.

4.3.6 Interactions between process dynamics and framework conditions

1. The impacts that IDH have achieved with partners (IDH 2013) illustrate that institutional and financial innovations can influence Dutch and international stakeholders and activities in the chain, particularly at producer level in producing countries (similar to the timber case).
2. Dynamics of the cocoa chain and challenges (the framework conditions) combined such that the STAP and IDH encourage contributions from all chain stakeholders, although the main focus is on private sector. Partnerships and platforms have been promoted to encourage the private sector collaboration with other chain stakeholders.

4.4 Cocoa PES

Payments for Ecosystem Services (PES) is a concept to compensate or provide incentives for taking conservation measures, offered to farmers or landowners in exchange for managing their land to provide some sort of ecosystem service. PES can be defined as (a) a voluntary transaction where (b) a well-defined environmental service or a land-use likely to secure that service, (c) is being 'bought' by a (minimum one) service buyer, (d) from a (minimum one) service provider. (e) if and only if the service provider secures service provision (conditionality). PES can be "a transparent system for the additional provision of environmental services through conditional payments to voluntary providers" (Tacconi 2012). Providers of ES generally accept payments greater than the cost of providing the services. Initial calculations indicate that PES such as carbon could be valuable for cocoa farmers (Norris 2010; Flores 2012).

4.4.1 Innovation history

In collaboration with CREM Advisors in Sustainability, Agro Eco-Louis Bolk Institute has been investigating the possibilities to apply PES to cocoa farming since 2010. The project was funded by the Dutch Ministry of Economic Affairs. The idea is that PES can support cocoa farmers to conserve biodiversity, to improve the delivery of ecosystem services such as clean drinking water and to stop deforestation. The assumption is that this can be achieved when cocoa farmers have a decent income and use sustainable farming methods so that the need to clear new forest every few decades is eliminated.

In the first phase of the project the ES relevant to cocoa production and methods to measure and value services such as carbon, biodiversity and water, were identified. CREM and Louis Bolk identified the suitable financial mechanisms to pay for them and three areas in Ghana, Ivory Coast, Indonesia and Brazil for conducting pilot projects. CREM investigated the willingness to pay for ES among 26 Dutch organisations, mainly cocoa companies. The main reason for these companies to engage in PES projects would be to stop deforestation, to maintain future productivity, to improve farmers' income and to increase biodiversity. Nine companies were seriously interested in paying for ES. In 2013, concrete PES projects were to be developed with cocoa farmers and potential ES 'buyers', but this has so far been delayed. Reasons given were that the ten year estimated timescale was (too) long for companies and the government. By the end of the pilot phase, the willingness of companies to participate became clearer. The response rate was low, especially without a grant, subsidy or support to incentivise participation and cover costs. Mainly larger companies such as Amtrada, Unilever and

²⁴ The ISEAL Alliance is the global (NGO) membership association for sustainability standards whose mission is to strengthen such systems for the benefit of people and the environment. Through membership, standards systems show a commitment to a unified movement of sustainability standards. ISEAL also has a non-member, subscriber category to engage with governments, researchers, consultants, private sector, non-profit organizations and other stakeholders with a commitment to the ISEAL objectives.

Tony Chocolonely were interested, and some were interested as they were already investigating PES with coffee and in a WCF project.

Power and control in the PES lies mainly with business and with the government, as financier and civil society and non-government organisations as implementers and promoters of the idea. Farmers, producer country governments and research organisations concerned with ecosystem services have less influence over developing the PES approach in the case, although particularly farmers and national governments are strongly implicated into putting this into practice and have financial incentive to do this, as farmers need to change practices and governments need to create and permit the institutional framework for PES.

The segments and stakeholders in the chain most implicated in the innovations described in this section are shown by the larger innovation "stars" in they are shown as most implicated in by the larger innovation 'stars' in Figure 8.

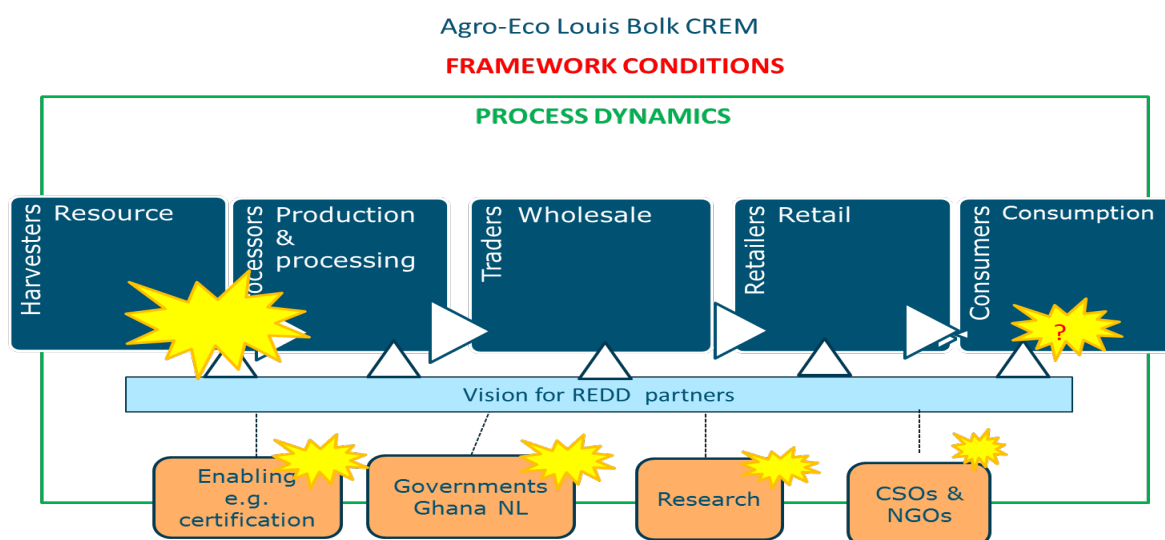


Figure 8: Innovations in the cocoa chain in PES by Agro-Eco Louis Bolk and CREM

*The yellow stars show places and processes in the chain where innovations have occurred.

4.4.2 Triggers and drivers, opportunities and barriers

A trigger to start the PES project was the then strong political focus on carbon, as one type of ES. However, by 2011 the failure and collapse of the carbon credit market established under the Clean Development Mechanism of the 2005 Kyoto protocol meant that other related tools were more attractive. A second trigger for PES was the international development of REDD+ mechanisms, where carbon is considered an environmental service because trees and soils have the capacity to absorb carbon dioxide.

The main drivers for PES are similar to the TEEB: making internal costs external and valuing ecosystem services as externalities. Certification (both tree based – such as FSC, and specifically cocoa based – such as UTZ, Rainforest Alliance and Fairtrade), has been a way to make externalities explicit and to allow payments for protecting such services by farmers, in the form of a premium payment or higher price, or and/or higher prices paid for consumers (as occurs in organic and FairTrade cocoa). The success of this approach is demonstrated by the increasing uptake of certified cocoa in the Netherlands and globally, as a sign that consumers are willing to pay for these 'costs and benefits' on a voluntary basis (Cocoa Barometer 2012). The prices of many certified mainstream cocoa and chocolate products has not increased for consumers (Barrientos 2011, KPMG 2012), indicating that price is not a barrier for products which also (implicitly) address ecosystem services, but that branding, image and quality are important (Barrientos 2011, KPMG 2012).

The main and easiest route was believed to include ES as part of certification, especially carbon (as part of REDD projects) by costing ES flows. A second promising avenue for PES identified is to

enhance agroforestry on cocoa farms. Agroforestry has been shown to allow additional income sources (Ramirez, Somarriba *et al.* 2001, Montagnini and Nair 2004) and can make farmers eligible for PES REDD payments. Louis Bolk now promotes mixing cocoa agroforestry combined with support for inputs for cocoa farmers (credit, fertilisers, crop protection chemicals etc.). A third possible route for cocoa PES, which is seen by some stakeholders as feasible, is landscape level certification of cocoa and certification of cocoa trees under forestry (i.e. FSC) certification schemes²⁵. The PES in cocoa pilot can be seen as an innovation that has made ES more explicit in the chain. Innovations have mainly occurred at the beginning of the chain.

The lack of Dutch Economic Affairs policy on PES (the reason why they are absent in Figure 8 provides an opportunity to formulate one specifically for cocoa. The interest of DGIS in landscape approaches and supply chains offers another point of entry²⁶. Making the ES concept simpler would also help uptake not just for its incorporate in certification standards, but to persuade companies to participate and to explain the concept to consumers. The experiences related by CREM and Louis Bolk, IDH and partners in using certification indicates that productivity increases (improving yields, minimising risks) are a more attractive way to integrate ES than PES as a standalone project. The multi-stakeholder REDD-based initiatives may also be a way to increase attention to ES. The Ghana government's 20 year commitment and vision for REDD (which includes cocoa) offers opportunities to make a difference, although the format (through landscape level certification, REDD payments, forestry and/or cocoa certification) need to be worked out and partnerships are slowly being consolidated. PES experiences and lessons learnt in Ghana could be applied to other cocoa production countries. The policy preference for results based PES over regulated markets (i.e. carbon), means it may be easier to harness initiatives by the private sector. Monitoring ES systems will need independent need oversight and some kind of regulator. This could be a role for auditors and for associations of sustainability standards such as the ISEAL Alliance.

Barriers to putting PES into practice include implementing PES at regional or landscape level. Currently cocoa certification occurs at farmer and trader level and is inappropriate for PES. During the pilots so far the full costs and benefits of PES have not always clear, although the implementation costs appear a major burden borne by farmers, with the time scale of benefit flows often uncertain and longer term.

Landscape level certification, such as that being investigated by organisations such as IUCN and the Rainforest Alliance²⁷ is an attractive concept (Schroth and McNeely 2011), but the sheer scale of covering setting up such as system to embrace and reward multiple (small scale) stakeholders is challenging. Most cocoa farmers are not members of groups, although actual membership is unknown, making reaching small holders who are not in groups is difficult and costly. Although partnerships such as the UNDP, NCRC, Katoomba Group and University of Reading have tried to broaden their partnerships to make this happen, a major barrier to date has been getting the government on board. Another important stakeholder is the Ghana Cocoa Board, which regulates policies related to production, research, extension, internal and external marketing, and quality control. The partners attempted to engage the Cocoa Board with little success to date, a factor which is seen as determining the success or failure of the programme and illustrates the importance of having framework conditions that match the process dynamics. Making the National Vision for REDD strategy into a long term, multi-partner initiative that includes cocoa is therefore an on-going, but not easy option.

Another barrier is that the initial interest by NGOs, civil society, business and governments in carbon credits has now waned and this option to advance payments for just one ES no longer looks like being the large scale or silver bullet as foreseen five years ago. There is also no clear ownership, champion

²⁵ See UNDP-Cocobod Environmental Sustainability and Policy for Cocoa Production in Ghana project http://www.undp.org/content/dam/ghana/docs/Doc/Partner/UNDP_GH_SUSDEV_Environmental%20sustainability%20and%20cocoa%20project.pdf

²⁶ See <http://beaglesolutions.nl/uploads/2012/02/report-suslandscapesend1.pdf>

²⁷ See for example <http://blog.ecoagriculture.org/2014/02/05/sustainability-certification-a-tool-for-taking-climate-smart-from-farm-to-landscape/> Retrieved 5 March 2014.
http://www.undp.org/content/dam/ghana/docs/Doc/Partner/UNDP_GH_SUSDEV_Environmental%20sustainability%20and%20cocoa%20project.pdf. Retrieved 5 March 2014.

for PES on cocoa in the different Dutch Ministries at the moment, another reason why the Dutch government is absent in Figure 8.

Land tenure and property rights, which are a central concept of PES, form another challenge. Most small holder cocoa farmers do not have official, registered title to the land they farm; this presents problems to actualising PES and to making contracts for PES. Support to help register farmers (as is happening in the UNDP-COCOBOD project in Ghana) could help. This is often a very politically sensitive subject, and in some of the major cocoa producing countries such as Ivory Coast and Ghana, is sensitive. Countries, with which the Netherlands has International Cooperation partnerships, such as in Ghana and Indonesia, may offer a more favourable route for Dutch interventions on land tenure.

4.4.3 Learning processes

There has not been a particular focus on learning in this PES case. The published reports and scientific articles enable information sharing and the platforms pave the ground for discussions and reflection, but not with a specific learning goal.

4.4.4 Extent to which ES are explicitly mentioned

The concept of PES makes ES explicit. However, there is tendency in projects to focus on a few services such as biodiversity, carbon, primary production ('productivity') and water. Whilst ES have been made explicit for companies in the chain, this does not appear to be so for farmers. This is in contrast to experiences in coffee sector agroforestry, where farmers have been shown to have the highest level of understanding of the amount and quality of ES from agroforestry coffee (Cerdan 2012). As PES policies aim to compensate individuals and/or communities undertaking actions that increase the provision of ES, they rely on incentives to induce behavioural change.

4.4.5 Role of and policy instruments applied by the Dutch government

The Dutch government played a 'facilitating' and 'partnering' role in commissioning the project. However, the government appears to have lost interest in PES pilot projects in cocoa and other chains. However, the CREM pilot indicated that some companies were interested because they are or have been engaged in other PES type activities, and suggests that facilitating voluntary, CSR based approaches may be successful.

4.5 Implications for Dutch policy

Recognising that PES is a market-based, incentive mechanism for trade, environmental and development policy, Dutch policymakers can draw on insights from the substantial body of knowledge about this type of instruments. The lessons from this case and other similar PES cases (Jack *et al.* 2008) indicate that the environmental, socioeconomic, political, and dynamic context of a ES policy strongly interacts with policy design and the value chain to produce the desired outcomes. The carbon credit and REDD projects and partnerships in Ghana show how the process dynamics and framework conditions also combined to provide inspiration for how PES approaches could work. Given the highly innovative nature of these projects and requirement for multi-level interactions (from global to local) both in the chain and among government agencies, the role of supporting and enabling policy and finance to allow pilot projects can be seen as critical in seeding innovation in these complex international chain and producer country context.

PES schemes appear to offer a direct, and possibly more equitable, method for achieving environmental outcomes than other approaches. However, the context in which a PES initiative is implemented matters greatly for effective policy design and the achievement of stated goals and has not been favourable.

Given the history and context of the two cases in the cocoa chain, ways in which the sustainable use and management of ecosystem services could further be integrated into the chain include:

-
1. Making the concept of ES more explicit in IDH's operations and the STAP, for example requiring ES to be valued and looking at payments and/or financing to ensure that ES related to cocoa production are maintained.
 2. As UTZ is one of the main channels used in the value chain to increase sustainability and is now well known to partners, this provides leverage to make ES more explicit in the UTZ standard. Partners may well be resistant to 'more' or higher standards however, especially if they have implications for productivity and competitiveness
 3. Most certification activities focus mainly on the producer level, not on other chain activities in processing, transport and production and their impact on ecosystem services, or vice versa, their use of ecosystem services. These stages however offer an entry point to address ES, particularly given the concentration of processors, manufacturers and consumers in the Netherlands. This approach also allows more direct facilitation by the Dutch government.
 4. Encouraging alternative certification schemes (such as Rainforest Alliance) which already promote ES more explicitly, to become partners in the STAP.
 5. 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. An approach could be to make more use of this network and common agenda to discuss how ES could be integrated into current approaches.
 6. In the STAP most power and control is exercised by business and IDH. Research organisations, civil society and non-government organisations concerned with ecosystem services have less influence. Certification organisations such as UTZ operate at a distance from the government with little direct involvement. A means for the government to address ecosystem services more directly in the chain could be to engage more and provide support to the stakeholders currently less involved, steering them to jointly develop a more proactive (instead of reactive) and explicit agenda on how ecosystem services can be more incorporated into the chain.
 7. The private sector's interest in other PES type activities (in cocoa and other commodities), indicates that PES may be a way to engage some stakeholders to address ES more specifically into their supply chain and corporate sustainability and responsibility initiatives. A PES mechanism could provide additional sources of finances for sustainable production improvements (directed at managing and improving specific services).
 8. Land tenure and property rights in cocoa producing countries are a central concept of PES but are a major challenge to implement this approach. There is little direct influence that the Dutch government can exercise in this area. However, if the Dutch development policy supports land tenure and planning reforms in its partner countries which are major cocoa producers (such as Ghana and Indonesia) this could have a positive, contributory impact to make PES more possible.
 9. Including other specific ES services in PES projects, to make the ES concept more explicit. The exact combinations of bundles of services will be context specific and depend strongly on how successful partnerships between stakeholders in the chain are made and the benefits different types of stakeholders expect to receive.
 10. Supporting pilot projects to make ES more explicit in product and landscape level cocoa certification.
 11. Supporting work to investigate the links between ES in other landscape-based approaches, such as Geographic Indication, branding and fine flavour or specialty cocoa.
 12. REDD projects and partnerships in Ghana provide inspiration for other countries where the Dutch support (STAP and IDH) is being provided, particularly the Ivory Coast (as the major cocoa producer) and Indonesia (as one of the Dutch partner countries).
 13. Continuing the PES pilot project, with support to share the costs for company's and farmer's participation, could convince more chain stakeholders that PES projects are a feasible way of integrating and valuing ES.
 14. Results-based PES systems need support and monitoring, which could be a role that or supported organisations could play.
 15. Promote Natural Capital Accounting in cocoa dependent companies, and draw upon accounting to promote ES inclusive improvements. Additional added value could be identified.
 16. The lessons from REDD, carbon credits and the partially implemented CREM-Louis Bolk project indicate that full cost pricing of cocoa that takes into account ES costs and benefits remains a priority. The government could further stimulate initiatives, such as that promoted under the 2012 Abidjan Declaration and 2014 Amsterdam Declaration during the World Cocoa Conferences, to calculate the true costs of cocoa, and benefits of sustainably produced cocoa.

5 The soy value chain

5.1 Introduction

This chapter introduces the soy value chain and presents one innovation case, the Round Table for Responsible Soy (RTRS). It uses the same methods and concepts outlined in Chapters 1 and 2 applies A general description of the chain along with the types of stakeholders involved, the process dynamics and framework conditions is provided. The analysis focuses on how ES are dealt with within the RTRS, what signs exist of the uptake of ES in chain governance and what learning processes exist so that they can be better used to further integrate ES into the value chain.

5.2 The soy value chain

5.2.1 Background

The soy value chain has received substantial attention in recent years with various studies providing a good overview of international production, trade flows, trends and the sustainability challenges that the value chain as a whole is facing. The studies illustrate the relatively important role that the Netherlands plays in the soy value chain, a result of its position as the second largest importer of soy in the world and its role as a major gateway into the European market.

Soy is an annual crop that yields an edible bean with a high protein and oil content (van Berkum & Bindraban, 2008). It yields more protein per hectare than almost any other crop (van Gelder and Kuepper, 2012) and has the potential to play a key role in addressing the challenge of global food security (WWF, 2014), especially as global demand for protein is expected to increase steadily as the world's population gets larger and wealthier (KPMG, 2013). Approximately 70% of the soy that is produced worldwide is used in animal feed (Dutch Soy Coalition, 2010) and demand from the animal feed sector has been a key driver behind the expansion of soy production in recent years (KPMG, 2013). Figure 9 provides a simplified illustration of the soy value chain.

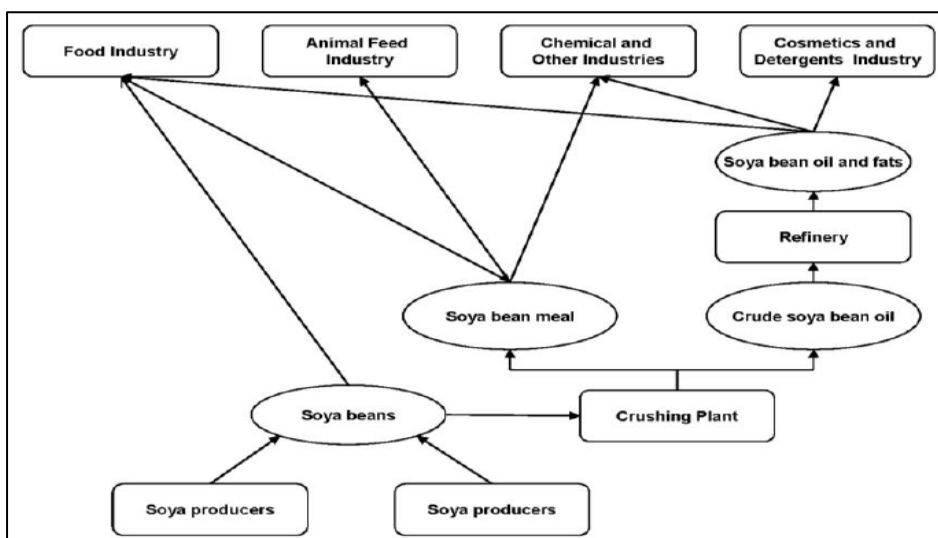


Figure 9: Outline of the soybean value chain. Source: Kamphuis et al. 2010

The production of soybeans has increased rapidly in recent times, from approximately 27 million tonnes in 1961 to 253 million tonnes in 2012²⁸ with the large majority of the supply (approximately 93%) coming from just six countries: Brazil, the United States of America, Argentina, China, India and Paraguay (WWF, 2014). The large increase in production has been realised through a rapid expansion of the area devoted to soy cultivation, rather than through productivity gains (Nassar & Antoniazzi, 2011). The total area dedicated to soy cultivation globally has risen from 23.8 million hectares in 1961 to 106.6 million hectares in 2012²⁹. The largest increases in production have occurred in South America, where production grew by 123% between 1996 and 2004 (WWF, 2014). In Brazil for example 10 million additional hectares of land was added for soy production between 2000 and 2010, an increase of 73% (KPMG, 2013).

International trade in soybeans includes the import and export of its two main derivatives, soybean meal and soybean oil. 91 million tonnes of soybeans were exported in 2011³⁰, around 35% of the worldwide harvest of 262 million tonnes, together with 65 million tonnes of soybean meal and 10 million tonnes of soybean oil. The most important exporting countries of soybeans, soybean meal and soybean oil are the United States of America (US), Brazil and Argentina. The US and Brazil export mainly soybeans, while Argentina exports mainly soybean meal and soybean oil (van Gelder and Kuepper, 2012). While the US has traditionally been the largest exporter of soybeans exports from Brazil have been increasing rapidly. Exports from the US have risen from 15.5 million tonnes in 1990 to 34.3 million tonnes in 2011 while Brazilian exports have increased from 4.1 million tonnes in 1990 to 33.0 million tonnes in 2011³¹. China and the EU are by far the most prominent importers of soy. China imports around half of the total global imports of soybeans (Dutch soy coalition, 2012) while the EU is the most important market for soybean meal. Soybean oil is imported in small amounts by a larger number of countries (van Gelder and Kuepper, 2012).

The Netherlands plays an important role in the soy value chain. Soy production in the Netherlands is negligible however it is one of the leading importers and exporters of soybean products, particularly soybeans and soybean meal. Up to a quarter of all the soy that is imported into the EU passes through the ports in Amsterdam and Rotterdam (Dutch Soy Coalition, 2012). A large percentage of the total Dutch imports of soybeans, soybean meal and soybean oil are re-exported to neighbouring countries directly, or after processing in the Netherlands into animal feed products (Hoste & Bolhuis, 2010). Dutch imports of soybean meal come mainly from Brazil and Argentina while the majority of soybeans come from Brazil with some coming from the US and Paraguay. Soybean oil is mostly imported from other European countries. In 2009, an area roughly one-third of the total Dutch land area (80% of its cultivated area) was estimated to be in production in Brazil for export to the Netherlands (Hoste & Bolhuis, 2010). Given its prominent role as an entry point for soy into the EU the Dutch government has taken an active role, through its strong support of the Sustainable Trade Initiative (IDH), in attempts to increase the sustainability of the supply chain. One of the initiatives that the Dutch government indirectly supports is the 'Foundation for Transition to Responsible Soy' (Stichting Ketentranstitie Verantwoorde Soja), a foundation that was set up to facilitate sector-wide efforts at improving the sustainability of the soy value chain. IDH is responsible for half of the foundations funding, while participating businesses and sector organisations are responsible for the other half.

5.2.2 Ecosystem services and the value chain

As mentioned previously the rapid growth of soy production has mainly been the result of area expansion. As a result discussions on ecosystem services are centred on soybean production and the expansion of production into undisturbed ecosystems, the connection this has with deforestation and the resulting environmental impacts on issues such as greenhouse gas (GHG) emissions and biodiversity loss (Nassar & Antoniazzi, 2011). The WWF (2014) in its recently published report 'The Growth of Soy: Impacts and solutions', states that the expansion of soy production is contributing to a

²⁸ All data from FAOSTAT downloaded from <http://faostat.fao.org> on 20-11-2013

²⁹ All data from FAOSTAT downloaded from <http://faostat.fao.org> on 20-11-2013

³⁰ Trade data from 2011 is used as 2012 data was not yet available via FAOSTAT

³¹ All data from FAOSTAT downloaded from <http://faostat.fao.org> on 20-11-2013

“decline in biodiversity and a loss of ecological services that we rely on, from clean drinking water and healthy soils to pollination and pest control” while Da Silva *et al.* (2010) suggest that while deforestation for crop production has decreased in recent years the contribution of deforestation to GHG emissions and cumulative energy demand remains significant. In the 2014 TEEB for Business Brazil Final report results are presented for a comparison between soybean monoculture production and soybean production where 20% of the land is conserved as cerrado. Soy farming in the cerrado is highly industrialized and mechanized to provide large-scale production with low labour inputs. The results indicate that the total value of ES generated by soybean production with 20% cerrado is 16% higher than that generated by soybean monoculture production (US\$558 compared to US\$ 482 per hectare per year).

The report notes that provisioning services provide the largest contribution for both production systems while the most significant driver of the difference in environmental value is the increased global climate regulation achieved in soybean production with 20% cerrado. The cerrado is estimated to offer carbon sequestration equal to US\$85 per hectare per year compared to soybean monoculture which offers US\$0. Figure 10 presents the results of a case study where the total environmental value was calculated by subtracting the value of agricultural-related environmental impacts from the value of the ES they provide. The total environmental value provided by soybean production with cerrado is 11% higher than that provided by soybean monoculture (US\$486 per hectare compared to US\$440 per hectare). Van Beukering *et al.* 2013 also indicate that the environmental costs of farming in the cerrado are higher (due to increased water, use, pesticide and, herbicide and fertiliser use, and the impact of monoculture on biodiversity, although costs of deforestation in the cerrado are lower.

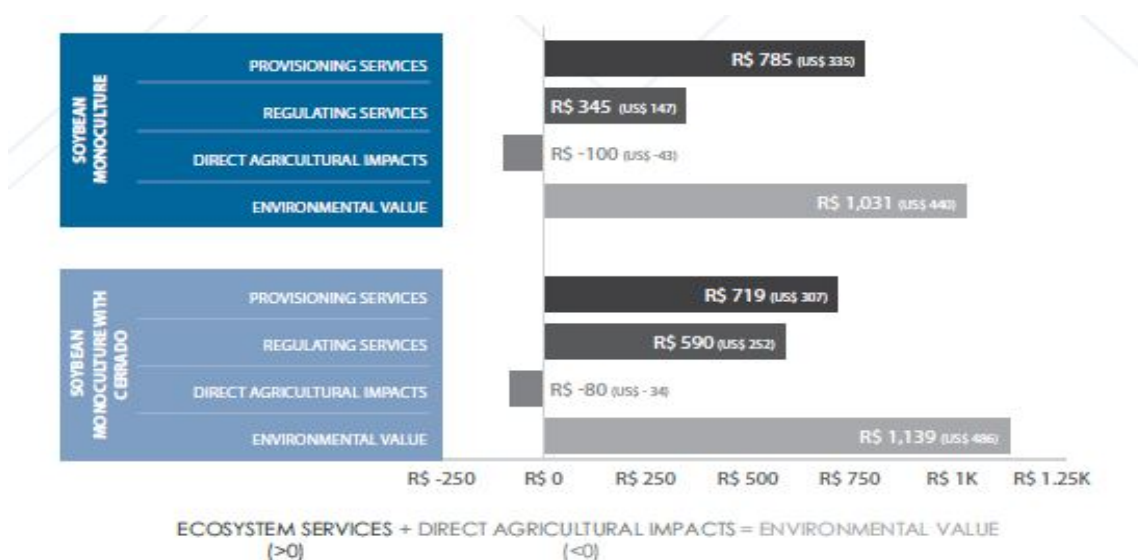


Figure 10: Results of TEEB case study comparing environmental value of soybean monoculture production versus production with 20% cerrado. Source: TEEB for Business Brazil, 2014.

5.2.3 Process dynamics in the soy chain

The soy value chain is more complex than the simplified version presented in Figure 10. The complexity of the global soybean agri-food system and its economic, social-political and environmental impacts are not grasped by any single study (Téran, 2011). Aside from the stakeholders directly involved in the production, trade and consumption of soybeans and its derivatives (producers, traders/crushers, cooperatives and consumers) exist a host of indirect stakeholders involved in influencing, governing or lobbying for changes at various stages along the chain (Van den Berg *et al.*, 2013). These include rural unions, public environmental and labour agencies, governments, bi- and multi-lateral organisations, industry associations, and civil society organisations among others, all with varying environmental, production and social lines of action (Nassar & Antoniazzi, 2011). With this said it is still important to realise that a relatively small number of large multinationals control large volumes of the soy value chain. Crushers and traders, meat and dairy companies, and retail and catering businesses have a considerable influence on soy producers and have the potential to play a

prominent role in the future direction of the value chain in terms of its approach to sustainability (WWF, 2014). The WWF (2014) provides a good overview of the major players in each of the value chain segments. The value chain dynamic will also be heavily influenced by the future trends in international trade and consumption. The European market is currently the front runner in terms of formulating a sustainability agenda, in most part due to the increasing demands of consumers. China, by far the largest importer of soy in the world does not however place any sustainability requirements on the soy that it purchases. Chinese consumers have not shown anywhere near the same level of interest or concern as their European counterparts and their future participation in the sustainability discussion will become more important in the future as food security becomes more of an issue.

Attempts to find a solution to the various sustainability issues has resulted in a number of market-based voluntary certification standards and initiatives for sustainable soy along with the introduction and/or revision of national (land –use/forest) legislation. Certification standards and initiatives include the ProTerra standard³², the Roundtable for Sustainable Biomaterials (RSB), Organic, Fairtrade, EcoSocial, SojaPlus and non-GM along with RTRS (WWF, 2014), one of the innovation case studies examined in detail in Section 5.3. Unfortunately very little is known about the direct and indirect costs and benefits of these sustainability standards and initiatives, especially in terms of their impact on ES and for whom exactly they are beneficial. A study by KPMG in 2012 is the only published attempt aimed at evaluating the economic feasibility of the certification of sustainable soy. In their attempt to do so KPMG (2012) tried to assess the business case of RTRS producers in Brazil and Argentina. The report attempts to take into account the overlap between RTRS and national legislation requirements to estimate the business case of RTRS certification alone and attempts to do this for 3 producer groups in Brazil (close to certification medium size, far from certification medium size and major producers) and 2 in Argentina (close to certification medium size and far from certification medium size). A number of assumptions are made about the benefits of RTRS certification, including a premium €1.50 per MT and the amount sold (RTRS certified producer is able to sell all soy at a premium).

The report concludes that “producers will receive payback on their investment in certification at different times, depending on the sophistication of internal controls and the size of the business. The best prepared large producers can recoup their investment within 1 year while less-prepared medium-sized producers can achieve return on investment in less than 5 years” (KPMG, 2012). KPMG indicate that the conclusions are not without some validity concerns, given that RTRS certified soy has only been available since 2011. Additional and on-going research into the costs and benefits of certification and a deeper understanding of the tools available for promoting sustainable production is clearly needed. Ecosystem services were not explicitly mentioned in the KPMG (2012) cost- benefit analysis.

Although quantitative evidence is lacking certification is one of the limited amount of options available to a value chain aiming to improve the sustainability of production. In 2011 the most important stakeholders in the Dutch soy value chain combined their efforts by signing a declaration of intent with the stated aim of using only responsible soy for the production of meat, dairy products, eggs and other food products in the Netherlands by 2015 (CBS, 2013). This translates into a sector-wide goal of ensuring that 2 million tonnes of certified soy (RTRS or equivalent) enters the Netherlands in 2015. The ‘Foundation for Transition to Responsible Soy’ (Stichting Ketentransitie Verantwoorde Soja), the body set up to coordinate the sectors efforts, set yearly targets of 500,000, 1 million tonnes and 1.5 million tonnes for 2012, 2013 and 2014 respectively (IDH, 2011). In 2011, the first year that RTRS soy entered the market 140,000 tonnes was purchased and in 2012 the amount increased to nearly 315,000 tonnes (CBS, 2013). Although progress has been made achieving the set goal for 2015 remains a challenge.

³² ProTerra was created in 2006 as a follow-up to the Basel criteria, a set of criteria for responsible non-GM soy developed by the WWF-Switzerland and the Swiss retail chain Coop in 2004.

5.2.4 Framework Conditions

The framework conditions listed in Figure 4 (regulation, business operation environment, demand, political system and infrastructure) can have a positive or negative influence on attempts to increase the integration of ES into the value chain. Framework conditions can be country/region/sector specific with the degree of influence on innovation within the chain varying (Van den Berg *et al.* 2014). The most relevant developments for the Dutch government in terms of soybean production are those taking place in South America (Brazil and Argentina in particular but also to a lesser extent Paraguay) where producing country governments are attempting to facilitate a change of course through the introduction and/or revision of national (forest) legislation and land use planning (LUP) reforms. These reforms are tied to the ways in which soy production is being realised. Van Beukering *et al.* (2013) list three; namely the direct land conversion of tropical forest to soy plantation; indirect deforestation due to soy-related infrastructure development; and indirect deforestation due to the displacement of ranching, family farms and rural labour. KPMG (2013) suggest another two; government subsidies to soy producers and new breeds of soy becoming available that perform well in areas previously thought unsuitable for soy cultivation.

The legislation that is being introduced is aimed at preventing the loss of natural vegetation areas and the irresponsible expansion of agriculture (of which soy production is a contributing factor). A changing playing field influences the available windows of opportunity for innovation and the location within the conceptual framework where innovation can take place. Given the rate of expansion of soy production and deforestation in various areas in South America, governments are attempting to take steps towards increasing the sustainability of not only soy production but of land use planning and agriculture in general. These efforts have a direct impact on the state-of-play in the soy value chain with Dutch links and have an influence on the direction and intensity of the effort exerted by private companies, civil society and importing country governments, such as the Dutch government towards sustainability goals.

National legislation is constantly being revised and updated with varying results. Recent developments have seen some innovative pieces of legislation introduced, aimed at combining redesigned regulatory approaches with changes in land use incentives. A contributing factor to attempts at changing the incentives surrounding land use has arisen from the payment for ES debate and attempts to take the costs and benefits of development fully into account.

Brazil has various laws protecting its forests with the most important set of laws for private farms being the Forest Code. The Forest Code was amended in 2012 after a bitter dispute between the Agricultural sector and the conservation movement. "Strict and consistent enforcement of the Code, even though it has been watered down" (WWF, 2014) remains one of the largest challenges. The new data base for monitoring compliance (Cadastro Ambiental Rural), which is part of the new Native Vegetation Protection Act, is expected to lead to more efficiency in enforcement but it is expected to remain a challenge. As of 2011, for example, less than 1% of the fines levied for failing to adhere to the act at the time had actually been paid; a result of uncertain ownership and poor enforcement (The Economist, 2011). In any case, under the new act landowners in the Amazon are obliged to maintain 80% forest cover - an increase from 50% in 1996 (WWF, 2014) while those within the cerrado are required to maintain 20% (TEEB, 2014). The Soy moratorium³³ has helped to increase the protection of the Amazon but this has led to an expansion of soy production in other areas, particularly the Cerrado.

Argentina enacted the 'Forest Law' (National Law 26,331) in November 2007 in response to increasing pressure about the increasing rates of deforestation. The law intended to "regulate the protection, enrichment, restoration, utilization, and management of native forests and the environmental services they produce" (Seghezzo *et al.*, 2011). Within a year of the passing of the law, each province was

³³ The soy moratorium, was signed on the 24th July, 2006. In it Brazilian sector organisations ABIOVE and ANEC, large companies (eg: Cargill) and civil society organisations pledged not to trade soybean produced in the Amazon Biome which had been deforested after July 24, 2006. The commitment was originally valid for 2 years but has been extended a number of times, now valid until the 31st January, 2014.

required to initiate a comprehensive participatory Land Use Planning Process (LUPP) with respect to native forests (Seghezzo et al, 2011). 20 out of 23 provinces have policies in place for managing native forests however forest clearing still occurs in designated 'no-go' zones leading some to conclude that the law is not yet being applied or administered effectively. Funding allocation is also at just 10% of the level required by legislation (WWF, 2014).

Paraguay has recently approved a new payment for ecosystem services (PES) policy (Law 3.001/06) which will support efforts to reduce deforestation when it is put into practice. Landowners whose land is more than 25% forested (the legal minimum) can obtain certificates of environmental services for their additional forests. These certificates can then be sold to landowners who are not in compliance, as a means of meeting their 25 per cent obligation. In addition, "environmental service providers" would benefit from tax reductions on their properties. Smallholders with fewer than 20 ha, indigenous lands and protected areas can also apply for the certificates (WWF, 2014).

5.3 Innovation case – Round Table for Responsible Soy (RTRS)

This section presents an analysis of one case innovation from the soy value chain: the Round Table for Responsible Soy (RTRS) (see Section 1.3 for the selection criteria). It uses the structure and four research questions outlined in Chapter 2. Some background information is followed by a description of innovations relating to ES. Some barriers to further innovation are discussed before the interaction between process dynamics and framework conditions are described. The case closes with some policy recommendations.

5.3.1 Innovation history

"Roundtables are a specific form of global private governance. They are private arrangements with the aim of improving the sustainability of a global commodity chain. They are multi-stakeholder platforms where private parties – (businesses, NGOs) – share in the decision making power. Instead of creating a niche market, as is often the case with private global governance initiatives, Roundtables develop standards that are meant to make an entire commodity chain more sustainable" (Schouten, Leroy & Glasbergen, 2012).

The RTRS is a multi-stakeholder initiative, where "soy producers, merchants and processors work together with banks and social organisations to ensure the worldwide sustainable cultivation of soy and the social responsibility of the soy sector" (Van Beukering *et al.* 2013). The RTRS was first proposed in 2005 by the WWF after some agribusiness multinationals abandoned the more stringent Basel Criteria for Responsible Soy production (GMWatch, Friends of the Earth and Corporate Europe Observatory, 2011) but was formally founded in Switzerland in 2006. It has the following 5 main objectives:

1. Facilitate a global dialogue on soy that is economically viable, socially equitable and environmentally sound.
2. Reach consensus among key stakeholders and players linked to the soy industry.
3. Act as a forum to develop and promote a standard of sustainability for the production, processing, trading and use of soy.
4. Act as an internationally recognised forum for the monitoring of global soy production in terms of sustainability.
5. Mobilise diverse sectors interesting in participating in the Round Table process³⁴.

The RTRS is organised in a general assembly and an executive board formed by members of 3 constituencies: producers, industry, trade and finance and civil society groups, and then a secretariat that coordinates the association. Academics, government representatives or other groups are allowed

³⁴ Information obtained from the RTRS website www.responsiblesoy.org

to join, however only as observing members with no voting power. As of October 2011 the RTRS had 150 members from all over the world including representatives soy producing and importing countries such as Brazil, Argentina, the US, India, China, Singapore and several European countries including the Netherlands³⁵. The RTRS has developed a standard for responsible soy production which includes requirements for the preservation of areas with high conservation value (HCVAs), the promotion of best management practices, the guarantee of fair labour conditions and the respect for land tenure claims. Alongside the standard and process of certification is the credit trading platform, allowing certified soy to be converted into credits and traded on a shared IT platform. The first version of the RTRS standard was approved in June 2010 and in 2011 the first RTRS certified soy became available. The standard has recently been revised and updated with the second version approved and released in September 2013. The standard is based on 5 principles, namely:

1. Legal compliance and good business practices.
2. Responsible labour conditions.
3. Responsible community relations.
4. Environmental responsibility - the term Ecosystem services is specifically mentioned once in the standard, in relation to high conservation areas providing such services.
5. Good Agricultural Practices (GAP).

The RTRS's target is for 5 million tonnes of responsible soy by 2015. In June 2011 industrial users had purchased the first 85,000 tonnes of responsible soy and by April 2012 nearly 150,000 hectares of soy plantations had been certified.

RTRS and the EU-RED Scheme

The EU has set a target that 10% of all energy in the transport sector should come from renewable resources by 2020. The European Union Renewable Energy Directive (EU-RED) has led to large increases in the demand for biofuels, including the biodiesel that is produced from soy (WWF, 2014). To counter criticism that setting such a goal only serves to stimulate the further destruction of valuable ecosystems for biofuel production, the EU has introduced the requirement that biofuels used in the EU (whether locally producer or imported) must comply with sustainability criteria. As stated on the European Commission's website³⁶ these "*criteria aim at preventing the conversion of areas of high biodiversity and high carbon stock for the production of raw materials for biofuels. The entire biofuels' production and supply chain has to be sustainable. To this end, the sustainability of biofuels needs to be checked by Member States or through voluntary schemes which have been approved by the European Commission (EC)*". The RTRS's EU-RED scheme which was specifically developed for soy biofuels is one of only fifteen schemes that the European commission has recognised as compliant with the EU-RED scheme.

Dutch involvement in the RTRS

As mentioned previously, the main Dutch food chain sectors have jointly committed to using only responsible soy for the production of meat, dairy products, eggs and other food products in the Netherlands by 2015. The commitment includes a definition of sustainable soy as soy that is certified to RTRS standards, or equivalent. This implies a commitment to and support of the RTRS. The Dutch government's Sustainable Trade Initiative (IDH) is a RTRS project sponsor. It runs pre-competitive market transformation programmes in 18 sectors. It has €130 million of co-funding from the Dutch, Swiss and Danish governments and its investments are jointly funded by private companies. IDH's soy programme (www.idhsustainabletrade.com/soy) with a budget of €6.5 million currently supports projects in Brazil, Argentina and Paraguay, helping soy producers to become RTRS compliant (WWF, 2014). The Dutch government, through its financing of IDH therefore has adopted a supporting and facilitating role aimed at increasing the uptake of the RTRS.

ES are not mentioned explicitly in either the first (2010) or second (2013) version of the RTRS standard. Principles 4 and 5 of the standard do however have implications for ES in the areas where soy is produced. As Van Beukering *et al.* (2013) write, Principle 4 aims to minimize environmental

³⁵ The RTRS website www.responsiblesoy.org has a complete list of members.

³⁶ http://ec.europa.eu/energy/renewables/biofuels/sustainability_schemes_en.htm

impacts by taking necessary measures to limit the negative impact of large or high risk new infrastructure (4.1), minimise pollution and manage waste production waste responsibly (4.2), reduce emissions and increase sequestration of greenhouse gases (4.3), limit the expansion of soy cultivation after May 2009 to land that has not been cleared of native habitat (4.4) and maintain and safeguard on-farm biodiversity through the preservation of native vegetation (4.5). Principle 5, covering GAP also contains a number of ES relevant conditions such as the quality of surface and ground water should be maintained or improved (5.1), natural vegetation areas around springs and along natural water courses are maintained or re-established (5.2), soil quality should be maintained or improved and erosion avoided (5.3) and pesticides, fertilizers, and biological control agents should be handled responsibly to minimise negative environmental and health impacts (5.4-5.9). The principles of the standard implicitly refer to ES, by requiring and encouraging certified producers to place a higher value on natural vegetation areas.

In addition to a revision of the standard RTRS began a mapping project in 2012 in an attempt to guide responsible soy expansion in Brazil. This is similar to the approach taken by Paula & Oscar (2012) in their study on land-use planning based on ecosystem service assessment. Paula & Oscar (2012) suggest that the identification and measurement of ES variations as a consequence of land use changes seems to be an adequate way to evaluate environmental costs and benefits of different land use planning decisions. The RTRS outline the mapping project as follows:

"Brazil is one of the most important soy producing and exporting countries in the world and the soy industry continues to expand in response to increasing international demand. However, soy's expansion threatens Brazil's unique biomes, natural habitats and the ecosystems that contain high levels of biodiversity and threatened endemic species, as well as provide environmental services to farmers, indigenous populations, and local communities embodying traditional lifestyles" (BACP, undated)

They continue by adding that *"the infeasibility of a complete restriction of soy expansion of soy cultivation an appropriate mechanism was needed to define which land types or habitats would be subject to conservation, expansion or restrictions"* (BACP, undated). The aim of the mapping project is to create national macro-scale maps that will guide responsible expansion. The maps designate the following 4 categories of land area:

- Category 1 Areas: areas which are critical for biodiversity (hotspots), where stakeholders agree there should not be any conversion of native vegetation to responsible soy production.
- Category 2 Areas: areas with high importance for biodiversity where expansion of soy is only carried out after an HCVA assessment which identifies areas for conservation and areas where expansion can occur.
- Category 3 Areas: areas where existing legislation is adequate to control responsible expansion (usually areas with importance for agriculture and lower conservation importance).
- Category 4 Areas: areas which are already used for agriculture and where there is no remaining native vegetation except legal reserves and so no further expansion is occurring.

While the mapping project is primarily intended for producers seeking RTRS certification the RTRS also suggests that the mapping project "may have a larger potential application as a guidance tool for other land uses such as the cultivation of other commodities, biofuels, raw materials and livestock" (BACP, undated). The RTRS is currently busy conducting pilot projects together with experts, visiting different locations and farms to test the validity of the maps. It is hoped that the final version of the maps and all related documents will be made available in 2014.

In addition to the mapping project is a payment for ecosystem services (PES) project, launched in January 2014. The RTRS states that the aim of the project is to "analyse and develop a PES scheme for categories 1 and 2 of the maps in Brazil. The project will mainly use the framework of the new Brazilian Forest Code, and/or other global PES mechanisms available, but is open to develop and implement innovative PES mechanisms". The project together with the RTRS land use and conservation maps are envisaged to provide the chain a biodiversity conservation and environmental services maintenance tool as well as providing tangible benefits to soy farmers who are seeking opportunities to preserve forests, critical biodiversity areas and High Conservation Value Areas (HCVA), improving the livelihoods of farmers as environmental service providers (RTRS, 2014).

Figure 11 shows the segments and stakeholders in the chain most implicated in the innovations described above. The size of the “star” indicates the extent to which a particular actor or segment has been implicated up to this point. A strong focus of the RTRS is multi-stakeholder involvement which sees stakeholders from all segments participate, albeit with varying levels of commitment. The RTRS is in itself an innovation, instigated by a sector-wide concern for the effects of industrial-scale soybean production in areas of Latin America. This has required the involvement and support of Governments, NGO’s, civil society, and the business community at every step along the chain. Consumers have been the hardest to reach but this is not unexpected given the relative distance between consumers and soy beans in comparison with other tropical commodities such as cocoa and coffee. Project-based innovations within the RTRS aimed at addressing ES require the input and cooperation of stakeholders involved mostly at the beginning of the chain, such as processors and traders with the support of governments and NGOs. This is because as mentioned above, innovation has been focused on addressing the expansion of soybean production into vulnerable ecosystems in producing countries.

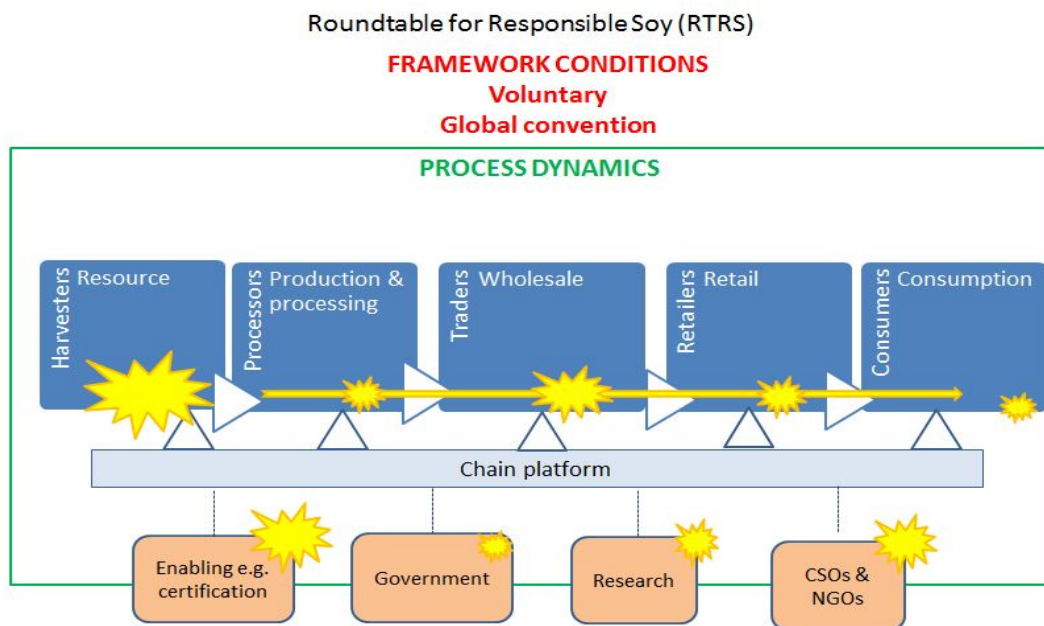


Figure 11: Innovations in the soy value chain by RTRS

5.3.2 Triggers and drivers, barriers and opportunities

There are currently a number of challenges facing the RTRS. These include for example the uptake of the RTRS label. If the number of members is not significant enough then there are fears that the RTRS will be reduced to a niche market, reducing the overall impact of the initiative. Concerns have also been raised about the costs involved, as with certification more generally. The costs may see the unwilling creation of barriers to entry (membership) and participation for certain producers, something that will work against the standards credibility.

Agreement on the RTRS standard is also a potential barrier. GMWatch, Friends of the Earth & Corporate Europe Observatory published a critical assessment of the RTRS in 2011 in which they describe the RTRS approach as a watered-down one designed to get agribusiness multinationals to participate. They take issue with a number of elements of the RTRS criteria writing that 1) the RTRS standard ignores the genetically modified (GM) soy debate by allowing GM roundup ready soy to be certified as responsible; 2) the RTRS has weakened the requirements surrounding deforestation, allowing deforestation to occur in those areas that have been ‘zoned’ for agricultural use and those that have been cleared of forest/native habitat up to May 2009, 5 years later than the 2004 limit set by the Basel criteria; 3) although reassuring the words of the RTRS do not provide or explain a mechanism or structure for assuring the competence or impartiality of HCVA assessment; and 4) zoning decisions are typically made at the state/national level leaving the process open to corruption.

The LUPP land zoning process in Argentina for example saw environmental protection assessments (EPAs) falsified with no participation from indigenous people, resulting in huge areas of land being zoned for agribusiness use.

GMWatch, Friends of the Earth & Corporate Europe Observatory (2011) also provide some criticism of the RTRS Mapping Project. They consider the mapping project to be a huge undertaking that will take too long to complete. They believe that the macro scale maps are not sufficient as they are “too superficial to assure that any piece of land under consideration for clearing is dealt with justly, impartially, transparently, and on the basis of facts in relation to social and environmental responsibility”. Instead of conducting a slow costly and ultimately imprecise macro-mapping project during which a weak interim process will allow developers to clear virtually every piece of land they wish they argue for an “impartial, 3rd party, transparent evidence based process” to be put in place instead. The impact of the RTRS RED add-on criteria is still contentious as there are concerns that the EU-RED scheme will only encourage the clearance of forest and other valuable ecosystems for environmentally destructive biofuels production for use in Europe.

5.3.3 Learning processes

Learning is not explicitly mentioned by the RTRS however there is a growing movement towards evaluating the impacts of certification, a role which the ISEAL Alliance has been actively promoting. The RTRS disseminates information about its activities via its website to enable information sharing and to facilitate discussion but not with a specific learning goal.

5.3.4 Process dynamics within the RTRS

The RTRS has become visible in international discussions about the sustainability of soy production and its effect on ES and has developed an international reach. This does not mean that it's organisational structure, principles and criteria or the extent to which it claims to be able to achieve results have not come under criticism. In a stakeholder analysis of the 150 RTRS members Schouten, Leroy & Glasbergen (2012) identified, 29 as producers, 16 as civil society, 73 as coming from industry, trade and finance and 32 as being observing members without voting power. They find that the balance of interest is firmly with industry, trade and finance (62%) followed by producers (25%) and civil society (13%), although they make the note that each constituency group is given voting power of one third to avoid domination by any one group. Schouten *et al.* (2012) also found that the geographical spread of membership is skewed compared to the global production and consumption of soy. Europe has a 44% share of all members compared to 37.4% for South America. The US on the other hand, one of the largest producers of soybeans is barely represented with 4% of all members and despite its major role on the global soy market China only contributes 2% of RTRS members. “The inclusion of smallholders, local groups and global development NGO's has proven to be very challenging throughout the Round Table process” (García-Lopez & Arizpe, 2010) and consumers are not represented at all.

Téran (2011) highlights the absence of major issues such as land concentration, large scale production, the concentration of soybean trade to a few multinational companies, the Brazilian dependency on imported fertilizers and the monopoly on GM seeds in the RTRS, stating that while for some the RTRS “has achieved a dialogue between stakeholders that were previously locked in a polarized confrontation”, with the dialogue contributing to the “inclusion of environmental issues in the agenda of the main stakeholders of the soybean chain, and for others it has allowed “multinational and national soybean companies to disguise their public image as socially and environmentally responsible while maintaining their usual unsustainable soybean production system”.

5.3.5 Framework conditions

Framework conditions (policy revision, regulation and implementation) in producing countries play an important role in the innovation capacity of the RTRS. The process dynamics within a multi-stakeholder initiative such as the RTRS are complicated enough but a constantly evolving playing field makes it even more challenging to attain consensus. The Dutch government (via IDH) supports the

RTRS however as mentioned earlier the Foundation for Transition to Responsible Soy, of which IDH is a 50% stakeholder, requires soy purchased by the Dutch soy sector to be compliant with the RTRS or an equivalent standard. Currently what is meant by 'equivalent' is poorly defined meaning that the strong support for the RTRS will continue. However the attitudes and decisions of the Dutch sector may change when 'equivalent' is better defined. It is hard to what the consequences of a shift in purchasing priority from the Dutch sector would have on the RTRS and the support provided to it by the Dutch government (via IDH).

5.3.6 Role of and policy instruments applied by the Dutch government

In 2008 the Dutch Sustainable Trade Initiative (IDH) started with a soy program that aims to support compliance to RTRS criteria by creating cost-efficient traceability models that ensure low costs to the system and by increasing mainstream market demand for RTRS soy. The IDH programme is primarily co-funded by the Dutch government.

Many governments, including the Dutch government have aims and policies to make commodity chains more sustainable. Regulations for trade in sustainable soy products, however, do not exist. The only regulations in the Netherlands (many of which derive from EU directives) concern food and feed labelling, and genetic modification. This is also due to (perceived) WTO restrictions. Therefore formulation of sustainability criteria similar to the RTRS (i.e. ProTerra, organic) are the domain of voluntary, market based initiatives.

Concerning the use of soy as a biofuel, there are strict EU criteria apply. Recently the Commission Corbey advised the Dutch government on sustainability criteria for the agricultural and food sector. They argue that the same strict EU criteria should apply for the import of biomass for the food sector. To support the development of a sustainable market for food products they propose to increase fiscal tariffs on biomass that does not meet those sustainability criteria.

5.4 Implications for Dutch policy

The RTRS is still very much dependent on the course of the changes taking place in regards to the framework conditions (policy revision, regulation and implementation) in those countries largely responsible for soy production. The ability of the Dutch government to influence the course taken by producing country governments should not be over-estimated. This said there are a number of opportunities for the Dutch government in terms of further integrating ES into the soy value chain. These include:

1. Consider (more direct) governmental engagement in the RTRS to increase consumer & business-to-business awareness of ES.
2. Support activities for a better enabling environment in soy producing countries. Distinctive strategies for each country, scale and region should be supported.
3. Support increased demand for sustainable soy through more direct government engagement in multi-stakeholder platforms at the national and international level.
4. Engage with soy value chain stakeholders in the US and China and seek agreement on an EU-wide standpoint.
5. Consider funding additional research into topics including 1) the measurement and comparison of alternative land use patterns and management practices and their relative impacts on biodiversity in soy production landscapes, 2) the costs and benefits of certification, 3) a better understanding of the import and export flows of soy (and soy derivatives) into and out of the Netherlands, 4) the comparability of different sustainability standards to promote efficiency and 5) show impact of certification schemes on ES along with pilots into how ES can be further integrated into the soy value chain.
6. Consider clarifying and strengthening laws governing soy imports including fiscal incentives for the import of sustainably certified or ES friendly soy.
7. Engage companies into Natural Capital Accounting, and using those insight for improving production services, and other services that even might generate added (social) values.

6 The palm oil value chain

6.1 Introduction

This chapter introduces the palm oil value chain and presents the innovation case of the Round Table for Sustainable Palm Oil (RSPO). It uses the methods and concepts outlined in Chapters 1 and 2. It provides a general description of the chain along with the types of stakeholders involved, the process dynamics and framework conditions. Special attention is paid to understanding how ES are included in the value chain, what the signs are of uptake in chain governance and how learning processes are evolving so that they can be better used to further integrate ES into the chain.

6.2 The palm oil value chain

6.2.1 Background

Over the past 20 years oil palm has become one of the most important oil-seed crops. It is an important commodity used in many food and non-food products, such as cooking oils, soaps and detergents, cosmetics, lubricants, oleo-chemicals, animal feed and more recently also biodiesel. The raw material passes through several stages of processing before it reaches the consumer (see Figure 12). In final products that are bought by consumer the palm oil often is only one of the many ingredients, which is regularly listed as vegetable oil and not explicitly marked as palm oil. As a result consumers are often unaware of the fact that palm oil is one of the ingredients of products they consume. Increasing demand for biofuel and increasing consumption in China and India is expected to lead to further expansion of oil palm plantations (Bhagwat and Willis 2008). Globally oil palm plantations cover over 14.7 million hectares. Global palm oil production increased from around 2.4 million metric tonnes in 1970 to approximately 56 million tonnes in 2012 (FAO 2014). In 2012 Indonesia accounted for 47% of the global palm oil production and Malaysia for about 37%. Together these two countries cover about 84% of the global palm oil production (Figure 13).

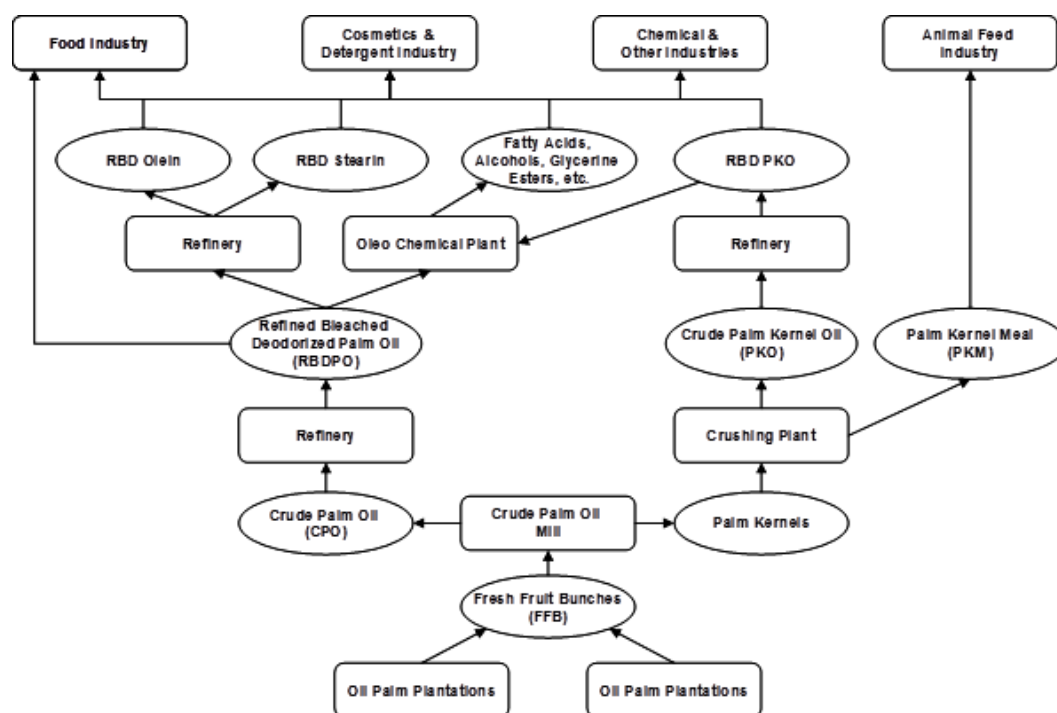


Figure 12: Outline of the palm oil chain. Source: FAO 2014

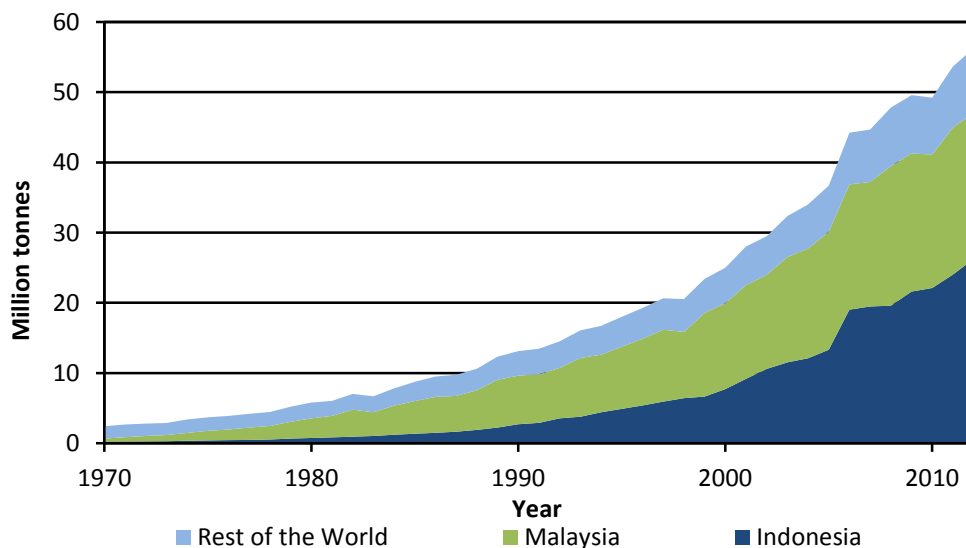


Figure 13: Development of the production of palm oil (incl. palm kernel oil) in Indonesia, Malaysia and the rest of the World 1970 – 2012; Source: FAO 2014

Role of the Netherlands in the chain

The Netherlands is an important link in the global trade of palm oil. In 2009 India (5 million tonnes) was the largest importer of crude palm oil, followed by the Netherlands with 2.1 million tonnes (see (Kamphuis *et al.* 2011)). In that same year China was the largest importer of refined palm oil (2.3 million tonnes), while the Netherlands was also an important importer of oil cake (2.1 million tonnes) (Kamphuis *et al.* 2011). In 2012 of the total world production of palm oil, about 10% (5.6 million tonnes) is shipped to the EU, of which a large part is first imported in the Netherlands. In the period 2007-2009 the value of the annual Dutch import of palm oil accounted for 7% of the global trade in palm oil products, while for crude palm oil this share was 15% and for palm oil cake even 23%.

At the same time Dutch industry plays an important role in improving the sustainability of palm oil. Dutch manufacturers like Unilever are among the founding and active members of the RSPO. In 2007 a Taskforce on Sustainable Palm Oil was established that represents all major stakeholders in the Dutch palm oil chain. In 2010 the parties participating in the task force agreed on a target that by the end of 2015 all palm oil for the Dutch market should be sustainable certified through one of the three RSPO approved trading systems (Task Force Duurzame Palmolie 2010).

In 2012 the Dutch Sustainable Trade Initiative (IDH) started with a palm oil program that concentrates on support to small holders. Due to scale and productivity issues, in general for small holders it is much more challenging to meet sustainability criteria. The focus of the IDH program is to improve agricultural practices of small holders in Indonesia, improving productivity of existing plantations and to develop traceable sustainable palm oil systems. The IDH programmes are primarily funded by the Dutch government. In line with the IDH programme in Indonesia, the Dutch government in November 2013 the Dutch and Indonesian government agreed to strive to ban production of non-sustainable palm oil in Indonesia³⁷. The IDH sustainable palm oil programme should offer an important basis for this.

Many governments, including the Dutch government have aims and policies to make commodity chains more sustainable. Regulations for trade in sustainable products, however, are hardly in place, mainly due to (perceived) WTO restrictions. Therefore formulation of sustainability criteria like from the RSPO for palm oil is largely left to market based initiatives. The Dutch government in 2008 considered the RSPO a promising international initiative. As a result of this it was considered not necessary to develop regulatory and legislative frameworks to address import of sustainable palm oil.

³⁷<http://www.rijksoverheid.nl/nieuws/2013/11/22/nederland-en-indonesie-tekenen-voor-duurzame-palmolie-handel.html>

6.2.2 Ecosystem services and the value chain

The rapid expansion of palm oil plantations is associated with high rates of deforestation (e.g. (Fitzherbert *et al.* 2008, Koh and Wilcove 2008, Danielsen *et al.* 2009, Koh and Wilcove 2009, Sheil *et al.* 2009)). The deforestation pathways of plantation establishment may be direct (deforestation as primary motive; replacing 'degraded' forests or combined economic activities) or indirect through improved accessibility of forested areas (Fitzherbert *et al.* 2008).

The large scale conversion of primary and secondary forests into oil palm plantations has had significant negative impacts on biodiversity and lowered the capacity of the converted landscapes to deliver similar ecosystem services (Kamphuis *et al.* 2011, Van Beukering *et al.* 2014). Particularly the destruction of the high levels of biodiversity (i.e. orang-utan habitats) found in many forests prior to their conversion receives a lot of attention, while previously harvested forests are sometimes seen as degraded lands whose conversion will result in limited loss of biodiversity. These forests, however, still maintain a large share of species from primary forests (eg. Kamphuis *et al.* 2011, Woodcock *et al.* 2011, Edwards *et al.* 2012, Edwards and Laurance 2013, Ramage *et al.* 2013). In fragmented landscapes such 'degraded' forests therefor may play an important role in conserving biodiversity. Also in terms of carbon stocks there is a lot of discussion on the importance of so-called degraded or secondary forests³⁸. Deforestation of degraded or secondary forests is still allowed under RSPO certification, but will inevitably result in the loss of endangered species (Edwards *et al.* 2010, Kamphuis *et al.* 2011), and loss of carbon stocks and water services (Lucey *et al.* 2014, Van Beukering *et al.* 2014).

6.2.3 Framework conditions

The description of the framework conditions in Indonesia draws on Kamphuis *et al.* (2011). The development of oil palm plantations in Indonesia shows a steep growth from the mid-nineties of the last century onwards, from less than 1 million hectares around 1990 to more than 7 million ha in more recent years (Kamphuis *et al.* 2011). In 2009 the total area was 7.3 million ha, of which 5.06 million ha is mature and producing (Shean 2009). Also in the future Indonesia is predicted to maintain its leading position in world palm oil production, increasing its output from around 26 million tonnes in 2012 (FAO 2014), palm oil and kernel oil) to 40 million tonnes in 2025 (projections from (FAPRI 2011)). The strong increase in palm oil production in Indonesia is driven by the large global demand for crude palm oil and is facilitated by different levels of the Indonesian Government. An important role in this respect plays the decentralization of power caused by the fall of Suharto, which has given the lower local level authorities (district) the right to decide on the use of state land. Local government authorities are leasing land to private companies that started large-scale oil palm plantations. In 2007 the total planted area accounted 6.8 million hectares of which 3.3 million hectares was controlled by private companies, 2.8 million hectares by smallholders and 0.7 million hectares by public companies. Small-holders accounted for 35% of the total crude palm oil produced and 41% of the productive area (Vermeulen and Goad 2006, Sheil *et al.* 2009). Because of the required machinery and palm oil mill, most smallholder plantations occur as nucleus estates in cooperation with larger, company owned plantations (Sheil *et al.* 2009). These so-called 'supported small-holders' cultivate some 25.000 hectares of land in Indonesia, while the so-called 'independent small holders', who do not have outside assistance, cultivate some 650.000 hectares of land (Vermeulen and Goad 2006).

Deforestation for plantation development increasingly occur in the hilly inlands of Central Kalimantan, although a recent report by ISRIC concludes that these lands are highly unsuitable for oil palm (Mantel *et al.* 2007). Plans to establish 1.8 million hectares of oil palm plantations along the Sarawak-Kalimantan border, through the heart of Borneo (The Kalimantan Border Oil Palm Mega Project) have failed so far. Based on the proposed extensions for oil palm plantations, West Kalimantan, Riau and Papua will become the largest palm oil producing states by 2020. Currently Papua is still a minor producer.

³⁸ <http://news.mongabay.com/2014/0714-poynton-commentary-35-tons-c.html>

Oil palm expansion has been associated with conflicts with local communities that are driven from their land and sources of livelihood. Expansion into less suitable and non-favourable areas like the hilly inlands of Central Kalimantan and establishment of plantations on peat swamps is seen as a strategy of companies to prevent conflicts with communities. The Indonesian Ministry of Forestry statistics indicates that 70% of the current oil palm estates in Indonesia are located in areas formally belonging to the Indonesia's forest estate between 1982 and 1999 (Sheil *et al.* 2009). The timber yields from conversion to plantation can offset the costs of plantation establishment and generates cash income during the initial stages of plantation establishment and growth. Many oil palm plantation companies are associated with logging companies to make this possible (see (Casson 2000, Casson 2007)). This process is expected to continue also elsewhere in Indonesia because part of the oil palm concessions to be developed are planned in forest areas (Venter *et al.* 2009).

Approval of development plans for oil palm plantations over 1,000 hectares still need authorisation from the central government (Colchester, Jiwan *et al.* 2006). According to the Indonesian Government there is still an area of 27 million hectares of unproductive forest land available for palm oil production (Colchester *et al.* 2006). This estimate probably does not take into consideration that a large number of people in Indonesia depend on these state forest areas for their livelihoods. It is estimated that 60-90 million of the in total 220 million people in Indonesia depend on forest resources. As a consequence the transformation from state owned forest land to oil palm plantations directly affects rural communities.

6.3 Innovation case - Round Table for Sustainable Palm Oil (RSPO)

This section presents an analysis of one specific case of innovation from within the palm oil value chain. The case that has been chosen is the Round Table for Sustainable Palm Oil (RSPO). The case study will look at the history of the innovation, the challenges it faces, the opportunities available for expansion and the extent to which ES are explicitly mentioned. The basis for the innovation history and process dynamics is from (Schouten and Glasbergen 2011).

6.3.1 Innovation history

With the strong expansion of palm oil production and consumption came also the discussion on the strong environmental and social impacts of palm oil production (see Section 6.2.1) and processing and ways to improve the sustainability of palm oil. After internal discussions on sustainability issues with palm oil, WWF-Switzerland asked an independent consultant to explore the possibilities for a WWF business partnership for palm oil (RSPO 2002). Potentially interested partners from palm oil trade and industry were contacted and the issues was also discussed with other NGO's. This resulted in a first meeting with representatives of palm oil processors and traders, food producers, retailers, financial institutions and NGO's in September 2002 in London. Here they agreed on the objective of promoting sustainable palm, both for the establishment of new plantations and improved management at existing plantations (RSPO 2002). Later that same year WWF, Unilever and the consultant further elaborated on the idea of a roundtable and decided on the establishment of an Organizing Committee to set up a first roundtable conference and two working groups to prepare specific inputs on the relationship between palm oil and forest conversion and on existing approaches for criteria and standards for sustainable palm oil (RSPO 2002).

After the first roundtable meeting in 2003, with more than 200 delegates from different sectors related to palm oil, covering 16 countries, the Round Table on Sustainable Palm Oil (RSPO) was established in 2004. Based on their extensive input in the process, WWF (NGO), Unilever (consumer goods), Aarhus United UK Ltd. (Processing), Golden Hope Plantations Berhad (plantation, now part of Sime Darby), Migros (retail), the Malaysian Palm Oil Association, Sainsbury's (consumer goods), are considered the founding members of the RSPO. At this time also the process to further develop and test criteria and indicators for sustainable palm oil was continued. These principles and criteria were ratified during the General Assembly of the RSPO in 2005. In 2007 a certification system on

sustainable palm oil was launched and adopted during the 5th roundtable meeting. Also the RSPO accredited the first certification bodies for independent audits. The first certified sustainable palm oil (CSPO) became available in 2008. In 2009 also a supply chain certification scheme was launched. Also in 2009 guidance for RSPO P&C for schemed smallholders was adopted, while in 2010 the same for independent smallholders for group certification were available. In 2010 also 25,000 smallholders that are associated with 5 companies received their RSPO certification. Until now consumer products containing palm oil are not labelled as such. Since 2011 the RSPO has a RSPO trademark logo that can be used on consumer end products to show the product contains sustainable palm oil.

RSPO Principles and Criteria

The RSPO Principles and Criteria for Sustainable Palm Oil Production (RSPO P&C) are the global guidelines for producing palm oil sustainably. The Round Table has defined 8 principles and 43 practical criteria to define sustainable production of palm oil. They intend to ensure that fundamental rights of previous land owners, local communities, plantation workers, small farmers and their families are respected and fully taken into account, that no new primary forests or high conservation value areas are cleared for palm oil production since November 2005, and that mills and plantation owners minimize their environmental impact.

The RSPO P&C must be reviewed every five years, in line with the demands from the global association for sustainability, the ISEAL Alliance. Such revision is an important learning process that allows to take into consideration new insights on sustainability issues and to account for new developments in the value chain. New insights, criticism and new opportunities that were experiences during the first five years period can be taken into consideration during the revision of the P&C.

Taking into consideration such new insights and new developments, the initial RSPO P&C were revised and reviewed in 2012/13. This revised RSPO Standard was accepted by the RSPO members at an Extraordinary General Assembly meeting in April 2013. There has not been explicit attention for ESs, with ES not being named, although many of the principles concern ES.. National interpretations of the global principles and criteria need to be revised to be fully consistent with the 2013 global P&C and should be operational by April 2014, and subsequently certificate holders need to comply with these revised national interpretations within 12 months. Public consultation for the revised national interpretations in Indonesia and Malaysia are ongoing and planned to finish by 18 April and 6 May respectively.

RSPO certification of sustainable palm oil and supply chain certification

Based on its P&C the RSPO has set up certification system related to plantation establishment and management, which should ensure that palm oil is produced sustainably. Additionally supply chain certification should ensure the integrity of the trade in sustainable palm oil, i.e. that palm oil sold as sustainable indeed is from RSPO certified plantations. Both certification systems involve third-party certification bodies. This is very similar to for instance the FSC Forest management and Chain of Custody certification systems. RSPO recognizes four supply chain certificates:

1. 'Identity Preserved': the product contains x % palm oil that can be traced back to a specific RSPO certified grower (mill and plantation); Highest level of certification. Products based on such palm oil are considered "Sustainable palm oil".
2. 'Segregated': the product contains x % palm oil that can be traced back to a shipment that originates from different RSPO certified growers; Products based on such palm oil is considered "Sustainable palm oil".
3. 'Mass Balance': the product contains palm oil, that according to the transporter or processor contains x% palm oil from RSPO certified growers; Intermediary level.
4. 'Book and Claim': the product contains palm oil, that according to the attached documents or certificates (Green palm Certificates) contains x% palm oil from RSPO certified growers; These can be used to show commitment and contribution to sustainable palm oil, but products cannot be labelled as sustainable palm oil.

Many major global traders and processors either have a certificate or are in the process of approval for a supply chain certification, almost all opting for both Segregated and Mass Balance certification. This is also the case for major traders and refineries in the Netherlands. For instance Unilever, one of the

major player has its facilities certified for Segregated certification. Currently Unilever has 100% RSPO certified palm oil, but 98% of it is based on Green palm certificates (book and claim, which are the lowest supply chain certificate), while only 2% is SG certified. After criticism by NGO's like Greenpeace Unilever now announced that it will speed up the acquisition of SG certified palm oil.

In the RSPO guidelines ecosystem services are only considered explicitly in the consideration of high conservation values. HCVA is considered an important tool for preventing and mitigating of impacts of agriculture, like oil palm plantations, on biodiversity and ecosystem services. The main aim of HCV assessments is to help plantation managers to improve environmental and social sustainability. The High Conservation Value Areas include areas with exceptional social, cultural or biological importance, and would include areas with high species diversity and high levels of endemism, areas that are important for the delivery of ecosystem goods and services to local communities and areas that are important for other social and cultural reasons.

For areas identified as HCVA management plans need to be developed that permits development of other areas of the plantation, but that ensures the maintenance of these high conservation values. Stakeholder consultation is an important, if not defining, feature of HCVA assessments. The HCV approach is not unique to the RSPO. It was defined in 1999 by the Forest Stewardship Council (FSC) and implemented in the FSC standard. Based on this global (2003) and national toolkits (since 2003) have been developed that should facilitate its use under specific local circumstances³⁹. As such it could be considered as an innovation external to the RSPO. Its developments takes into consideration experiences both from the RSPO as other certification schemes that use the concept. The RSPO adopted the HCVA approach since 2007. Where it initially was used for high biodiversity values, its scope has widened in the new RSPO standard that was endorsed in April 2013 and ratified by. In this revised standard previous experiences with the concept, also outside the RSPO's context, could be taken into consideration. In the new RSPO global standard HCV's are defined as:

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

Particularly the HCV's 4, 5 and 6 directly relate to conservation of ecosystem services. To establish the importance of areas for critical ecosystem services, community needs and cultural values, consultation of the local communities is important. As a note the standard mentions that the RSPO will develop coherent guidance for standardised identification, management and monitoring (and other types of relevant guidance) of HCVs which would include guidance for compatibility of national toolkits as necessary. Another important guideline that indirectly relates to ecosystem services in the RSPO guidelines (7.3) indicates that new plantations should not be established on land that replaced primary forest since November 2005. It contains a small provision that developments should actively seek to use previously cleared or degraded lands on mineral soils, but that this should not put indirectly pressure on forests through the use of all available agricultural land in an area. Although this guidance is not very specific, it directly refers to preventing indirect land-use changes (ILUC) to take place. A lot

³⁹ <http://www.hcvnetwork.org/about-hcvf/history>

of discussion, however, arises from the question what is 'primary forest' and if this provision is sufficient to protect important wildlife habitat and conserve ecosystem services. The RSPO guidelines still allow the conversion of so-called degraded or secondary forest areas, while these still may be important for biodiversity and locally (water regulation) and globally (carbon storage) important ecosystem services (see Section 6.2.2 for their importance for process dynamics related to these discussions).

Figure 14 shows the stakeholders involved in the chain and indicates their involvement in the RSPO innovations related to ecosystem services. The RSPO started with informal meetings between NGO's (i.e. WWF) and European companies, mainly consumer goods manufacturers (i.e. Unilever). The palm oil producers were not able to influence these first fundamental discussions that were the basis for the RSPO. The consumer goods manufacturers, afraid of reputational damage, play an important role in the innovation case. Campaigns of external NGO's seem to be very effective. Claims of unsustainable production and criticism on the RSPO are almost always directly countered by manufacturers by suspending imports from certain producers, or claims for further improvements in buying certified palm oil. Consumers seem to have had no direct role in the innovation. Indirectly, however, they play an important role as their changes in buying products from certain manufacturers and retailers substantiates the pressure NGO can exert in their campaigns against unsustainable practices.

Opportunities for innovation for integration of ecosystem services are mainly at the level of the plantations/producers. In general producers remain reluctant to embrace zero deforestation criteria and abandon plantation establishment on peat land. This reluctance of producers to implement stricter criteria for deforestation probably has many causes, like perceived limitations in possibilities to expand operations, and forfeiting income from forest conversion. Anticipated price premiums on certified palm oil have not yet been materialised, mainly due to the large scale use of relatively 'cheap' Green Palm Certificates by manufacturers and retailers to cover their sustainability claims (Greenpeace International 2013). If manufacturers move to stricter certification types, it is expected that price premiums on CSPO will increase, which may reduce some of the reluctance with the producers. This will, however, increase costs of manufacturers to use certified palm oil and may increase the price of end-products. Although this is a sensitive issue, Governments could support this through fiscal incentives for sustainable palm oil, or alternatively impose higher tariffs on the import of unsustainable palm oil.

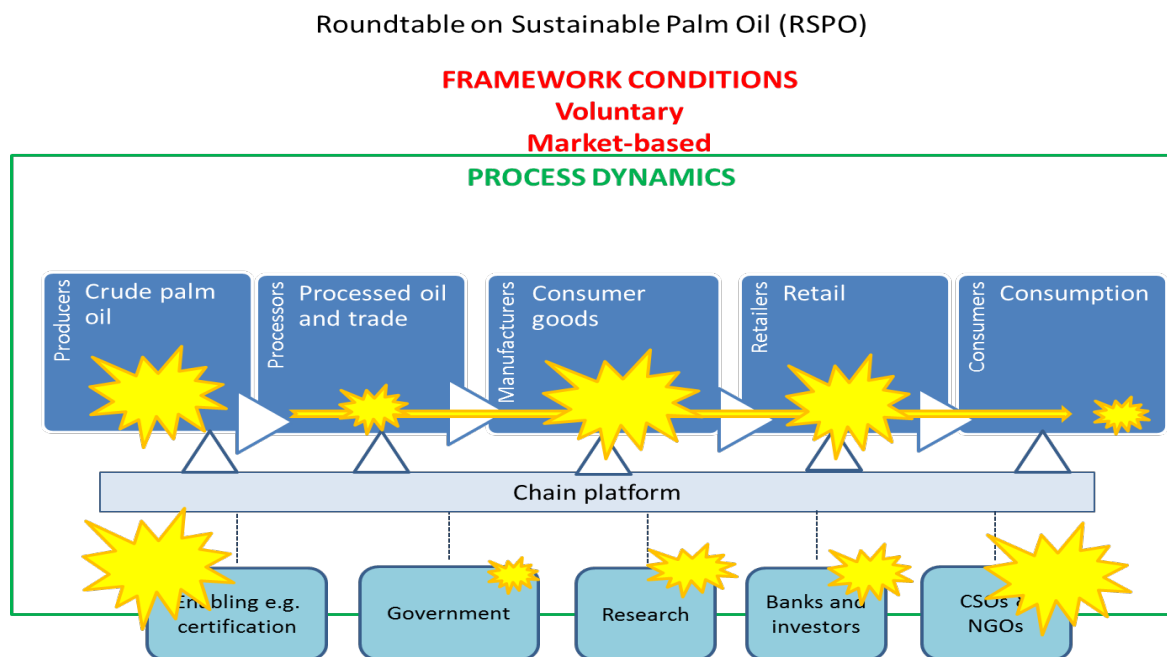


Figure 14: Innovations in the palm oil value chain by the RSPO

**The size of the stars gives an indication of the level of opportunities for innovation.*

Still production of CSPO is higher than the demand for CSPO. So also at demand side improvements are possible. Demand is mainly driven by European manufacturers and retailers. Here could be a role of governments to raise awareness of the importance of a transition to sustainable palm oil production, and explicit inclusion of ESs.

A cost benefit analysis of forest conversion for palm oil plantations versus sustainable use of forests in Kalimantan (Hein and van der Meer 2012) showed that net revenues of REDD+ (Reducing Emissions from Deforestation and Forest Degradation) schemes would need to be US\$ 3 per ton CO₂ to allow sustainable forest use to compete with oil palm plantations on peat, and US\$ 7 per ton CO₂ on mineral soils. Current market prices for carbon compensation are low due to a surplus of available rights, but still the required revenues appear to be in the same order as current market prices for CO₂ from REDD projects (2012, average 7,9 US\$ per ton CO₂, (Peters-Stanley, Gonzalez *et al.* 2013)). To make sure such REDD schemes are successful for preventing forest conversion to palm oil plantations mechanisms need to be in place that make sure that plantation owners are compensated for their activities leading to reduced conversion rates.

6.3.2 Process dynamics within the RSPO

The RSPO is a multi-stakeholder platform that brings together different stakeholders that represent seven sectors of the palm oil industry; 1) oil palm producers, 2) palm oil processors or traders, 3) consumer goods manufacturers, 4) retailers, 5) banks and investors, 6) environmental or nature conservation NGOs and 7) social or developmental NGOs. Its objectives are promoting the growth and use of sustainable oil palm products through the development and implementation of global standards for sustainable palm oil and engagement with stakeholders.

The RSPO establishment started with informal rules, but when it further evolved more formal rules of power were implemented as part of the learning process. Some of these rules were needed as new stakeholder were included in the process, while the development of other rules were the direct consequence of conflicts that arose due to a lack of rules. Initially only European stakeholders were present at the first preparatory meeting in London (RSPO 2002). Some parties were in favour of only including European demand side stakeholders, but others argued that the influence of exclusively European initiative would be very limited (RSPO 2002). Eventually it was decided that all stakeholders from the palm oil supply chain should be included in the process. At the first meeting of the Organizing Committee in 2002 the basis for the 'rules of the game' was laid. The participants (still all European at that time) agreed that decisions need to be taken on the basis of consensus; all public communications must be agreed upon by all participants; there should be maximum transparency and any impression of forming a cartel should be avoided (RSPO 2003).

To get the stakeholders from Malaysia (then still the biggest Palm oil producer) and Indonesia involved, the Malaysian (MPAO) and Indonesian (GAPKI) Palm Oil Associations were addressed. MPAO joined the process in 2003. It appeared, however, more difficult to engage the GAPKI in the process (Schouten and Glasbergen 2011). Eventually GAPKI, afraid for reputational damage of the Indonesian palm oil industry due to NGO campaigns and unfavourable comparisons with the Malaysian Industry that already had joined the RSPO, joined the RSPO in 2004. Rules for balancing representation in the RSPO process have been developed gradually. For instance during the first meeting of the working group on criteria for sustainable palm oil it was recognized that Indonesian producers lacked representation and that producers outnumbered social and environmental NGOs, while other sectors like trade unions, smallholders and indigenous peoples groups were not directly represented at all (RSPO 2004). The Organizing Committee also decided on the 7 sectors that would be distinguished (see above). Prospective members have to apply for membership as one of these groups or as an affiliate member. Affiliate members can be organisations or individuals that are not actively involved in one of the 7 sectors represented within the RSPO, but that express their interest in the objectives of the RSPO. They can participate in RSPO General Assembly meetings, but without voting rights.

The RSPO consists of an Executive board, General Assembly, a Secretariat and has several Working Groups dealing with specific issues. The decision on the division of seats for each membership groups in the Executive board was only reached after extensive discussion (see Schouten and Glasbergen

(2011)). It was negotiated that all groups would get two seats, except the producers that have four seats, each representing producers from Malaysia, one representing producers from Indonesia, one for smallholders and one representing the rest of the world. This in principle means that the producers have more weight in decisions taken by the board. However, since there are two groups of NGO's represented (environmental NGOs and social NGOs) together NGOs have the same weight as the producers. The Executive board is chosen by the General Assembly and acts by consensus vote. The General Assembly, however, is the highest decision making body of the RSPO. It is made up from all ordinary RSPO members that all have one vote. The General Assembly convenes annually and takes decisions by majority votes. This means that in theory one group can dominate the decisions, especially since there are large differences in number of members for each group. Since RSPO membership is dominated by manufacturers and growers, these are able to dominate the decision making process of the General Assembly (Hospes 2014). Producers have long been criticising their marginalised role in the RSPO decisions as they are the ones that carry the burden of certification. This is also seen as one of the reason the Indonesian producer's organisation GAPKI resigned from RSPO membership in 2011 (also see below).

The consensus based working groups that prepare specific topics and are aimed at reaching consensus on contentious issues, like the heated discussion on criteria for carbon neutrality in the revised P&C, are used to prevent that this actually happens. All ordinary and affiliate members can participate in these working groups. As such they present the most direct ways for participation in the RSPO process. Public consultations, like on the draft criteria and indicators, represent another way of participation in the RSPO and allows input from any interested person or group.

A conflict that arose with workers at a plantation in Indonesia in 2005 and lead to the dismissal of workers and banishment of their families from estate housing and estate school was the direct cause for the development and adoption of a Code of Conduct to which all members should adhere. The most important requirement (Schouten and Glasbergen 2011) demands members to support, promote and work towards production, procurement and use of sustainable palm oil. In principle members need to annually report on their progress in implementing the code of conduct, but in practice few companies actually do so and the Code of Conduct does not contain any provisions for measuring, verifying, or enforcing members' progress, so it is neither enforced (Schouten and Glasbergen 2011). At the same time a formal Grievance Procedure was implemented to address complaints against all RSPO members to ensure that alleged breaches of RSPO regulations (i.e. statutes, by-laws, criteria and indicators, etc.) are transparently addressed.

Governments cannot become members of the RSPO. This is to prevent that the RSPO process would be slowed down and become politicized. Yet governments play an important role as part of the RSPO's work is funded by governments. For instance the Task Force for Smallholder Certification Support Network receives funding from the Dutch government through the IDH Palm oil programme.

External NGO's are following the RSPO critically. Public campaigns of environmental and social NGO's focus on the manufacturers of consumer goods that will experience direct effects from consumer's decisions to boycott products. In this way internal NGOs (like WWF) and external NGOs (like Greenpeace and Friends of the Earth) reinforce each other actions. Where WWF tries to achieve stricter environmental principles from the inside, Greenpeace and FoE effectively put pressure on the manufacturers for improvements.

6.3.3 Triggers and drivers, opportunities and barriers

Currently there are a number of barriers that may limit further progress of RSPO certification and uptake by chain stakeholders. An important impediment is the growing impatience with some of the NGO's and producers countries governments with the actual uptake of RSPO certification. Although the area of certified oil palm plantations is increasing the actual demand and use of certified sustainable palm oil (CSPO) stays behind.

The largest demand for sustainable palm oil is from the EU, other regions hardly show an interest in sustainable palm oil, while the EU only covers a fraction of the total palm oil demand. Countries like

China, one of the largest importers of palm oil so far show no interest in sustainable palm oil. Moreover, some of the producers companies and industry representatives like the MPOC⁴⁰ (Malaysian Palm Oil Council) consider the (mainly) European and US demand for certified sustainable as a trade barrier to protect interests of local producers of rapeseed oil and soya oil. This is in contrast to the fact that some large multinationals that use palm oil, like Unilever, have initiated the RSPO and are among the largest buyers of (sustainable) palm oil.

In contrast to other certification schemes like FSC for tropical timber, the RSPO has never fully convinced environmental organisations that RSPO certified palm oil is sustainable⁴¹. There remain a number of issues that regularly result in discussion. One such is issue is that in the eyes of NGO's RSPO certified producers still engage in deforestation. The RSPO guidelines leave room for plantation development on secondary and degraded forest land, while from an ecological perspective these still may be valuable. Another issue relates to certified plantation owners that still engage in unsustainable practices in part of their concessions. A good illustration of this is the case of United Plantations that was the first producer to receive RSPO certification, Although its Malaysian plantations were certified, it continued unsustainable production from its Indonesian plantations.

There is also a lot of criticism on the level of certification. Of the four types of chain of custody certifications, currently the Green Palm certificate (book and claim chain of custody certificate) is the most common one, while at the same time it is the certificate with the lowest level of confidence that the palm oil is produced sustainably. It was intended as a first step towards true traceable sustainable palm oil. According RSPO regulations such palm oil may not get the predicate "sustainable palm oil". Yet many producers and retailers use it to refer to their palm oil as being "sustainable". Therefore the Green palm certification scheme has recently attracted a lot of criticism among members of the RSPO, particularly growers and millers, and environmental NGO's.

Both the Indonesian Palm Oil Association (GAPKI) and Malaysian Palm Oil Board have been very critical about the RSPO's reputation and credibility. The GAPKI even cancelled its membership with the RSPO in 2011. In a statement it mentioned that *"the Indonesian palm oil industries can move forward and will have a better image in the eyes of the world without involvement in the program"*⁴². This was also to show its full support to the Indonesian ISPO (Indonesian Sustainable Palm Oil). However, although GAPKI itself is no longer a member of RSPO, its members are given the liberty to stay with the international standard. The ISPO certification will be mandatory for all Indonesian palm oil producers.

The deadline for obtaining certification is 31 December 2014. It includes 7 principles:

- 1) Licensing and plantation management systems.
- 2) Implementation of technical guidance of palm oil cultivation and processing.
- 3) Environmental Management and Monitoring.
- 4) Obligation of workers.
- 5) Social and community obligation.
- 6) Empowerment of community's economic activities.
- 7) Commitment to long-term sustainable business.

The certification will be audited by third party certification bodies that are approved by the ISPO commission. The costs of certification are expected to be much lower than the estimated 25 USD per ha for RSPO certification, mainly due to less strict criteria.

⁴⁰ See interview with the COE of the MPOC: <http://www.mpoc.org.my/upload/RSPO%20-%20Merely%20a%20Certification%20Process.pdf>

⁴¹ "Palmoliefeestje ruw verstoord door Greenpeace; Duurzaam produceren Producent United Plantations wacht onderzoek." Trouw. (November 12, 2008): 557 woorden. Nexis. Web. Date Accessed: 2013/11/19.

⁴² <http://newswatch.nationalgeographic.com/2013/08/08/consumer-groups-slam-greenwashing-in-sustainable-palm-oil-marketing/>

The ISPO certification standard differs from RSPO standard mainly in environmental and social aspects that are likely important, if not crucial, for the incorporation of ecosystem services. The ISPO standard lacks requirement for an environmental and social impact assessment and does not include the need for an HCVA assessment and HCVA protection. Although this important difference, the mandatory aspect of the ISPO will likely improve general management of plantation and ensures the implementation of proper administrative requirements for certification of plantations. As a consequence for these plantations the additional step towards RSPO certification could be easier and cheaper than if one needs to start from zero. The development of the ISPO thus implies both potential barriers and opportunities for the RSPO process. Also see (Hospes 2014) for a more detailed comparison between RSPO and ISPO and their potential implications.

RSPO member retailers have been critical about the process based nature of the RSPO standard, which makes it very difficult to judge the sustainability of certified products. In a response to the RSPO P&C review, these retail members urged the RSPO to implement performance based criteria instead. Their main concern is that the P&C do not effectively fully prohibit deforestation on lands with high carbon stocks. Although plantations need to show they have plans to reduce pollution and emissions (Principle 5.6) and monitoring and reporting will be implemented they see it as a major shortcoming for the RSPO's credibility. For these retailers it is of outmost importance that credibility of RSPO certified palm oil is not disputed and that they can make a clear claim that using RSPO certified palm oil has not resulted in deforestation and peatland destruction. They also claim that there should be a clear trend of reducing GHG emissions from palm oil production like they try to achieve in other parts of the supply chain. Not meeting these criteria would result in the RSPO losing market support.

However, due to the consensus based nature of the decision making process in the RSPO, the revised standard contains a rather general requirement to address and report greenhouse gas emissions. Although a zero greenhouse gas emission target was proposed, this is not included in the standard. First monitoring and reporting tools for GHG emissions need to be developed and implemented. By the end of December 2016 this should be implemented. The discussion on implementation also resulted in frustration of NGO members like WWF. As a response some environmental NGO started their own initiative, the Palm Oil Innovation Group which aims to implement stricter environmental criteria than the RSPO currently has in place. This initiative is also supported by WWF, one of the RSPO founding member, who had long been defending the slow progress.

Related to this there is a more general lack of evidence of the impact of RSPO certification on sustainability. Given the large incidence of reported non-compliance with the RSPO C&I it is important that independent studies are carried out to provide such evidence (also see below).

The HCV approach is the most direct link between the RSPO criteria and indicators and ecosystem services. Currently, however, application of this tool falls short due to a complex of reasons, like it's perceived complexity and constraints with capacity to assess the conservation value of forests and other ecosystems. The approach also works best at a landscape level in which the value of a forest depends on what happens elsewhere in the landscape. As mentioned in the revised RSPO standard, it will be important to develop further management guidelines on the HCV approach within RSPO certified plantations considering the larger landscape.

There are also still opportunities to increase on site biodiversity and ecosystem services in oil palm plantations that at the same time are beneficial for the palm growers. For instance more biodiversity friendly practices that attract insect and pest predators (e.g. Koh 2008, Turner *et al.* 2008, Turner *et al.* 2011) will provide natural pest control. This may be achieved by altering the vegetation cover below the palm canopies ensuring certain species of flowering plants or at the landscape level by keeping larger areas of natural forests intact (Sheil *et al.* 2009).

The RSPO recently launched an impacts study⁴³, known as the "Socially and Environmentally Sustainable Oil Palm Research" (Sensor). The research is part of the Monitoring and Evaluation (M&E)

⁴³ http://www.rspo.org/news_details.php?nid=204

program by RSPO as part of its efforts for continuous improvement by collating scientific evidences. It is an independent scientific research that will examine the effectiveness of the RSPO standards.

The Sensor project⁴⁴ is an integrated multidisciplinary research programme that includes 5 Topic Areas covering TA1) Soil and water, TA2) GHGs and air quality, TA3) Biodiversity, TA4) Participatory processes and rights, and TA5) Livelihoods, with three cross-cutting Key Themes on the KT1) HCV process, KT2) Agricultural best practices and KT3) Cost-benefit analysis. Particularly TA1 to TA3 relate to interactions between oil palm plantations and ecosystem services. The cost benefit analysis under the biodiversity TA specifically focusses ways how ecosystem services are able to provide economic return to certified plantations and how these can balance the higher operating and management costs of RSPO certified plantations. The project intends to deliver most of the results before the next review of the RSPO's P&C in 2018, but will also provide interim results that can be used for further improvement of RSPO's policies. The research programme, however, currently is only partially funded. Additional funds will need to come from members and stakeholders.

6.3.4 Role of and policy instruments applied by the Dutch government

In 2012 the Dutch Sustainable Trade Initiative (IDH) started with a palm oil program that concentrates on support to small holders. Due to scale and productivity issues, in general for small holders it is much more challenging to meet sustainability criteria. The focus of the IDH program is to improve agricultural practices of small holders in Indonesia, improving productivity of existing plantations and to develop traceable sustainable palm oil systems. The IDH programmes are primarily funded by the Dutch government. In line with the IDH programme in Indonesia, the Dutch government in November 2013 the Dutch and Indonesian government agreed to strive to ban production of non-sustainable palm oil in Indonesia⁴⁵. The IDH sustainable palm oil programme should offer an important basis for this.

Regulations concerning trade in sustainable palm oil products do not exist. The only regulations in the Netherlands (many of which derive from EU directives) concern food and feed labelling, and genetic modification. This is also due to (perceived) WTO restrictions. Therefore formulation of sustainability criteria similar to the RSPO (i.e. ISPO, Green Palm and carbon based certification such as International Sustainability and Carbon Certification ISCC) are the domain of voluntary, market based initiatives. The Dutch government in 2008 considered the RSPO a promising international initiative. As a result of this it was considered not necessary to develop regulatory and legislative frameworks to address import of sustainable palm oil.

For the use of biofuels in the EU strict sustainability criteria apply. Recently the Commission Corbey also advised the Dutch government on sustainability criteria for the agricultural and food sector. They argue that the same strict EU criteria should apply for the import of biomass, like palm oil, for the food sector. To support the development of a sustainable market for food products they propose to increase fiscal tariffs on biomass that does not meet those sustainability criteria.

6.4 Implications for Dutch policy

Ecosystem services are currently mainly addressed in palm oil chains at the level of oil palm plantations. Conversion of forests to oil palm plantations (deforestation) has the biggest impact on ecosystem services. While the RSPO criteria prohibit conversion of primary forests, and requires the exclusion of areas with a high conservation values for biodiversity and ecosystem services, it permits conversion of degraded and secondary forests. There are no definitions, however of primary, secondary or degraded forest lands. Also many 'so called' secondary forests are still important habitat for wildlife species and still deliver important ecosystem services like water regulation and carbon storage.

⁴⁴ <http://sensorproject.net/>

⁴⁵ <http://www.rijksoverheid.nl/nieuws/2013/11/22/nederland-en-indonesie-tekenen-voor-duurzame-palmolie-handel.html>

Campaigns by NGO's like Greenpeace put pressure on the manufacturers and retailers like Unilever⁴⁶ and Nestlé⁴⁷ to accelerate their uptake of RSPO certified palm oil. These manufacturers in turn exert pressure on their suppliers to implement non-deforestation and zero emissions policies that move beyond the RSPO criteria⁴¹. Due to these seemingly conflicting interests and the apparently well balanced power within the RSPO, the discussions on this issue move forward very slowly. A working group on carbon emissions should move this forward. However, as a result of the slow progress on this issues NGO's (threaten to) abandon the RSPO, while producers (threaten to) leave the RSPO at the prospect of stricter forest conversion criteria (eg. Hospes 2014), in which they feel they have little influence. In practice, this creates a deadlock on these issues in the RSPO. It is expected that mainly producers with clear links to European manufacturers and retailers will adopt stricter policies on non-deforestation⁴¹.

In general producers remain reluctant to embrace zero deforestation criteria and abandon plantation establishment on peat land, while these are considered important improvements of the certification standard by internal and external environmental NGO's and European manufacturers and retailers. This reluctance of producers to implement stricter criteria for deforestation probably has many causes, like perceived limitations in possibilities to expand operations, and forfeiting income from forest conversion an current low price premiums on certified palm oil.

- Fiscal incentives for sustainable palm oil or tariff increases on unsustainable oil would be among the options for the Dutch government to further support the use and consumption of certified sustainable palm oil. For this to be possible compatibility with the WTO rules will need to be taken into consideration, which probably leave only limited room for tariff differentiation.
- Imposing the same sustainability criteria for the import of biomass for food and consumer products as is the case for biofuels (Brack 2014) would be another option. The urgency for manufacturers and retailers to source palm oil from plantations with stricter non-deforestation policies would increase.
- Bilateral agreements with producers countries, similar to the VPA's and FLEGT mechanism for timber could be considered. This would also support local governance in the producer countries.
- Governments could expand sustainable public procurement also to demand for instance RSPO segregated certified Palm Oil to be used in food and catering, similar to the UK central government procurement policy for sustainable palm oil in food and catering (see Brack (2014)).

⁴⁶ Unilever's response to criticism by NGO's that their sustainability claim is covered by Green Palm certificates is that it supports the transition to sustainable palm oil and does not represent "sustainable" palm oil.
<http://www.unilever.com/mediacentre/pressreleases/2013/100pcofpalmoilboughtwillbetraceabletoknownsourcesbyend2014.aspx>

⁴⁷ <http://news.mongabay.com/2014/0714-poynton-commentary-35-tons-c.html>

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

7.1 Introduction

This study explores the governance options available for the Dutch government to integrate the sustainable use and maintenance of ecosystem services (ES) into the cocoa, soy and palm oil value chains and to give such services a more explicit place in the mechanisms used to govern chains. This builds on work on the tropical timber value chain by Van den Berg *et al.* (2013). The rationale behind the study was to distinguish whether there are 'wins' to be gained for supply chain sustainability by acknowledging and improving the integration of ES. It was assumed that policy decisions in relation to the trade-offs and balances between different goods and services, ecosystem functions and impacts on biodiversity across time and space can be addressed through a range of governance options such as planning, policies and regulations, institutions, markets and payments. Innovations which address these issues were used as cases in this study.

The discourse analysis presented in Chapter 3 illustrates the current framework of governance options used and available to the Dutch government. The analysis shows that Dutch policies dealing with sustainable value chains and governance consistently lack a definition of ES.

In this chapter the innovation cases in the cocoa, soy and palm oil value chains⁴⁸ are analysed and compared, to provide insights into the interactions between these processes, the framework conditions in which the chains are embedded and the lessons that can be learned. Experiences and recommendations from Van den Berg *et al.* (2013) on the tropical timber chain are also integrated. The lessons focus on the sustainable use and maintenance of ES from an innovation system approach, and potential leverage points for government interventions. This enables recommendations to be made for the Dutch government in terms of possible governance options, presented in Section 7.4.

7.2 The value chain innovation cases revisited

This section briefly summarises the four tropical commodity chains innovation cases in terms of the sustainability strategies, how ES are addressed, how the stakeholders participate in the innovation processes and the role and policy instruments used by the Dutch government. As Van den Berg *et al.* (2013) explained (summarised in Chapter 2 this study), the integration of ES into approaches to increase the sustainability of international value chains is relatively recent.

Ecosystem services as an economic issue

The review of policy discourses - both explicit and implicit in Dutch policy documents - reveals how policy makers envisage ES in value chains. ES are positioned as both a global, European and national issue. The concept of ES however is not explained in relation to biodiversity and it remains unclear why certain policy objectives relate only to biodiversity and not to both biodiversity and ES. ES are dominantly related to markets and payment mechanisms, while biodiversity is associated with maintenance and sustainable trade chains. A dominant impression given by the policy documents is that the main cause of ecosystem degradation is the lack of incorporation of the costs of lost biodiversity and ES into market prices. This has led to a focus on economic measures as the solution to conserve and maintain ES. Sustainability challenges for business are framed as an opportunity to

⁴⁸ The four cases are: the Sustainable Trade Action Plan and UTZ certification, and Payments for ecosystem services (PES) (cocoa), the Round Table for Responsible Soy (RTRS) and the Round Table for Sustainable Palm Oil (RSPO).

strengthen the Netherlands' competitive position, particularly in recent policy documents. Another dominant discourse concerns 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 the only, or the leading, role to develop innovations for sustainable value chains. The evaluations of these collaborations or partnerships are not further elaborated in the texts.

Value chain sustainability strategies

The four cases illustrate the different dimensions of innovation: technical, organizational, economic and institutional, and how such dimensions are interwoven. Innovations in response to the complex challenges 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.

A number of studies have indicated that there are different strategies of innovation in value chains that seek to improve their sustainability (detailed in Section 2.6). Table 6 shows that in the four chains, the most popular strategies used were partnership, certification and promoting awareness of sustainability as a means to develop new business practices.

Table 6

Strategies in chain innovation aiming for positive impacts on chain sustainability

Innovation strategy	Cocoa		Soy	Palm oil	Timber			
	IDH & UTZ	PES	RTRS	RSPO	IDH	FSC & ForCES	Dutch Public Procurement Policy	REDD +
Policies creating an innovation-enabling environment for enterprises	✓		✓	✓	✓	✓	✓	✓
Sustainability as a driver of innovation	✓	✓	✓	✓	✓	✓		✓
Encouraging entrepreneurship	✓		✓	✓	✓		✓	
Recognising the role of intermediaries	✓				✓		✓	
Enhancing and supporting collective action	✓				✓	✓		
Partnering and partnerships, including platforms	✓	✓	✓	✓	✓	✓	✓	✓
Product innovation		✓				✓		✓
Creating 'positive deviance' situations and building on experiences								✓
Changing governance arrangements in chains –simplifying access to information	✓		✓	✓		✓	✓	
Introducing standards and standardisation	✓		✓	✓	✓	✓	✓	✓

Ecosystem services implicitly addressed

The cases in the four chains all highlight that ES are considered as one element of a wide objective; namely to increase the sustainability of international commodity value chains. Up to now ES have generally not been made explicit in these innovations, except the PES case, which was not successful in becoming a full pilot study. This may be changing as the policy framework is now using the simpler and more appealing, term 'natural capital' instead of ecosystem services. Also as the link between natural capital and value chain sustainability has been made much more explicit by including the ecosystems services, and related terms such as conservation and sustainable use of biodiversity as a sustainability criteria in the Dutch Parliament's Natural Capital agenda (Netherlands Government 2013: p1 & 3).

Community and consumer organisations are missing in the innovations

An overview of the stakeholders involved in the four cases is provided in Table 7. Such multi-stakeholder involvement was generally considered as critical to the success of innovation. Multi-stakeholder partnerships were common ways of implementation, with the Dutch government playing largely a facilitating and endorsing role, often with minimal liaison with governments in countries where the chains originate. The presence or absence of certain groups of stakeholders is notable, particularly that consumers (private, corporate or public) have hardly been included in developing the innovation. Consumers (both government, domestic and business) in all cases tend not to have driven the innovation but have been stimulated to change purchasing behaviour or been made aware of the need to address and integrate one or more ES in the chain ex-ante.

Table 7

Overview of stakeholders engaged in the value chain innovations

Case	Dutch Government	Government (production countries)	NGOs/ CSOs	Research	Private sector	Other
Cocoa certification	Economic and Foreign Affairs	Indirectly through commodity programs & projects	Involved in IDH STAP as partners (e.g. UTZ) but no funding	Indirectly through monitoring and evaluation studies	Traders and processing companies, wholesalers and retailers	Certification and support organisations e.g. Solidaridad
Cocoa PES	Economic Affairs	Directly through projects in origin countries e.g. Ghana	CREM, Louis Bolk		Traders and processing companies	
Soy RTRS	Economic and Foreign Affairs	Indirectly through commodity programs & projects	Involved directly through membership of RTRS, via IDH STAP, funding projects and evaluations	Indirectly through monitoring and evaluation studies	Traders and processing companies, wholesalers and retailers	RTRS Secretariat, certification, audit and support organisations
Palm oil RSPO	Economic and Foreign Affairs	Indirectly through commodity programs & projects	Involved in IDH STAP, RSPO, directly initiators e.g. WWF, funding projects and evaluations	Indirectly through monitoring and evaluation studies	Traders and processing companies, wholesalers and retailers	RSPO Secretariat certification, audit and support organisations

Case	Dutch Government	Government (production countries)	NGOs/ CSOs	Research	Private sector	Other
Timber 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
Timber 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
Timber 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 (VVNH)	Stichting Probos, Centrum Hout, Stichting Milieukeur (TPAC stakeholder internet forum), AgentschapNL, FSC-NL, PEFC-NL, PIANO, TPAC
Timber REDD+	DGIS, BZ	National governments	Indirectly through advisers, consultants, conducting studies	Indirectly through advisers, conducting studies		UN, World Bank

Indirect role of the Netherlands government

The Dutch government takes a steering but indirect role in all the cases. In the IDH cases, the government funds, steers and evaluates whilst the IDH executes and implements Dutch policy. Table 8 summarizes the multiple policy instruments used by the Dutch government in the four innovation cases. These are categorised according to the different governance approaches defined in Table 3. The innovations in the certification cases were led by private sector and civil society organisations, where the Dutch government predominantly used facilitating and partnering instruments. For example, supporting RTRS, UTZ and RSPO certification as part of its international trade and cooperation policies, by making funds available through organisations such as IDH. The government actively promotes the self-regulating capacity of the tropical commodity chains value chain stakeholders. This has been effective in reaching many of the major enterprises in the chains, especially those with Dutch connections. However, up-scaling to increase the extent of certification (in terms of number of producers certified and volumes of products entering international trade and the Dutch market) appear to be plateauing. This suggests that there are scale limits to such indirect, voluntary approaches and that 'low hanging' fruit has now largely been plucked.

Table 8

Policy instruments applied by the Dutch government

Case	Policy instruments used			
	Endorsing	Partnering	Facilitating	Mandating
Cocoa IDH-STAP	Supporting certification	Public Private Partnership Green Deal SFM	Direct co-funding (IDH) International cooperation policy	-
Cocoa PES +	-	-	Multi- and bilateral aid Strategic	-
Soy -RTRS	Supporting certification	-	Direct funding (IDH) projects	-
Palm oil - RSPO	Supporting certification	Multi-stakeholder procurement scheme development	Direct funding (IDH) projects	-
Timber- IDH-STAP	Supporting FSC certification	Public Private Partnership Green Deal SFM	Direct funding (IDH) International cooperation policy Public procurement policy	EU timber regulation
Timber- FSC	Supporting FSC certification	Green Deal SFM	Public procurement policy Bilateral aid Indirect funding through development and environmental NGOs	EU timber regulation
Timber- 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
Timber- 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 cases raises questions about the effectiveness and desired influence of the government when using voluntary standards and agreements. A more 'command and control' approach could increase the sustainability of these tropical commodity value chains by requiring higher standards across the sector, than currently implemented leading companies. This recommendation is based on the experiences and success regulations used in the timber case, such as public procurement and the tax on unsustainably produced timber, recommended in 2011 to the Dutch government by the Dutch Taskforce on Biodiversity and Natural Resources (Van den Berg *et al.* 2013). This approach shows how regulations can also be used in combination with voluntary private sector approaches. It has been shown that voluntary, market based approaches (i.e. voluntary agreements, self-regulation, CSR initiatives, certification and public private partnerships) all have limits to their effectiveness and level to which they increase the sustainability of trade - compared to government regulations (Lauber and Ingram 2000, Ten Brink 2002, Vermeulen and Seuring 2009,). The government relying solely on voluntary certification and declarations does not make full use of the range of other options nor has it so far been effective or successful in promoting ES as one element of sustainable chains. In all the cases involving voluntary standards, initial progress

has slowed as the government supported initiatives struggle to maintain their early momentum when front runners, innovators and larger companies with considerable market share joined roundtables and IDH programs. This is evidenced for example, by the impact reports of IDH and a recent emphasis on upscaling their work (IDH 2012, Ingram *et al.* 2013). As smaller companies and farmers, intermediaries and thousands of unorganised, small holder producers of commodities such as cocoa, timber and palm oil have been hard to reach and engage in the innovation cases described, such farmers require different types of incentives to convince them to voluntarily adhere to such initiatives.

Challenges to integrating ecosystem services

Further integrating ES into international commodity chains is challenging as the rules of the game are dynamic and frequently changing. The pace at which innovations in ES is taking place faster than the terms ES and natural capital have become used in Dutch policy agendas. Also due to the nature of these chains, all being tree-based on commodities which can take years to respond to changes in production, there is a long lead before changes are implemented and the impacts of policy instruments are felt along the chains. The challenges facing the chains to ensure sustainable use of 'natural capital' can be summarized as follows:

1. Interest in individual ecosystem services is strongly determined by (international) donor interest and finance. Where and when ES and natural capital has been linked to other topical political issues (carbon credits, REDD and certification) this has been a double edged sword, creating attention but also a risk when these topics fall off policy maker's radars.
2. ES (like TEEB) 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 international commodity value chains easier to understand and more accessible for value chain stakeholders. Using the term natural capital to (re)focus political interest on ecosystem services appears to have been more effective in stimulating interest, and particularly from corporate stakeholders. The use of capital and accounting language appears to resonate more with companies.
3. Combining different certification systems which cover different scales (commodities, ecosystem products and services, and landscapes), is attractive, similar to the philosophy behind the FORCES project for timber, but has proved difficult in practice.
4. There is little empirical evidence in the chains studied on the impact of certification against market standards for sustainable production on ES. There is a need for focused analysis which provides independent evidence that certification does indeed lead to improved ES.
5. It is important that the ES referred to are explicitly mentioned in standards such as the RTRS, RSPO, FSC and UTZ. This can be done by the standard setting organization itself, by creating additional stand-alone certification standards or by bundling certification schemes. ES certification requires standards at local, national and international levels. Related outcome/impact indicators need to be developed and used to monitor and assess ES supply and management.
6. Traceability and chain of custody issues can be complex. This makes monitoring of responsibly produced commodities challenging, especially where there is an long and fragmented chain between producers and consumers, such as cocoa, soy and palm oil. Developing clear and up-to-date feedback loops could benefit all the chain innovations studied here.
7. Cost benefit studies suggest that acknowledging ES can enhance opportunity costs. This may help overcome the substantial financial barriers to integrating ES, such as changes in land use and planning. The challenge is to combine these benefits with other incentives, such as secure land tenure.

7.3 Lessons learned from the innovation system approach

The innovation system approach developed by Van den Berg *et al.* (2013) was used to understand the interactions between innovation processes in the value chains along with the framework conditions, such as policies and regulations, market demand and the wider political system in which the value chains are embedded (see Section 2.7 for details on the methodology). By knowing how these interactions work, the dynamics of an innovation process can be explained, and the role of the Dutch government in initiatives for increasing the sustainability of these value chains and international commodity value chains in general can be assessed. This section analyses the triggers, drivers,

barriers and opportunities⁴⁹ of the four cases (see Table 9) and incorporates the results of the analyses on timber chains (Van den Berg *et al.* 2013) to provide a broader comparison.

Table 9

Triggers, drivers, barriers and opportunities in the cocoa, palm oil, soy and timber value chain cases

Case	Triggers	Drivers	Barriers	Opportunities
Cocoa PES				
Cocoa certification	<ul style="list-style-type: none"> • Societal pressure for sustainability • Value chain stakeholders need for credible systems to demonstrate sustainability 	<ul style="list-style-type: none"> • Promotion of PPPs • Business access to environmentally sensitive markets • Price premiums for producers, processors and traders • Funding (IDH) by Dutch government • CSR, reputation management, risk management 	<ul style="list-style-type: none"> • Uncertain growth in demand for certified products • Costs of certification vs. competitive advantage for companies 	<ul style="list-style-type: none"> • More integration of ecosystem services UTZ & RA standards/ scope for out-scaling the coverage of certification
Soy RTRS	<ul style="list-style-type: none"> • Societal pressure for sustainability • Value chain stakeholders need for credible systems to demonstrate sustainability 	<ul style="list-style-type: none"> • Funding (IDH) by Dutch government • Promotion of PPPs • Business access to environmentally sensitive markets, • Price premiums for producers, processors and traders • CSR, reputation management, risk management 	<ul style="list-style-type: none"> • Uncertain growth in demand for certified products • Costs of certification vs. competitive advantage for participating companies 	
Palm Oil RSPO	<ul style="list-style-type: none"> • Societal pressure for sustainability • Value chain stakeholders need for credible systems to demonstrate sustainability 	<ul style="list-style-type: none"> • Funding (IDH) by Dutch government • Promotion of PPPs • Business access to environmentally sensitive markets, • Price premiums for producers, processors and traders • CSR, reputation management, risk management 	<ul style="list-style-type: none"> • Uncertain growth in demand for certified products • Costs of certification vs. competitive advantage for participating companies 	
Timber - Sustainable Trade Action Plan 2011-2015	<ul style="list-style-type: none"> • Policy shift in Dutch development and economic policies ('from aid to trade') • Plea from CSOs, business and trade unions for a long term sustainability agenda 	<ul style="list-style-type: none"> • Promotion of PPPs • Funding (IDH) by Dutch government • Engagement of private sector 	<ul style="list-style-type: none"> • Ecosystem services indirectly addressed through certification • Singular focus on FSC/ no competition among certification schemes • Immature market for ES • Uncertain growth of demand for certified products 	<ul style="list-style-type: none"> • IDH approach to learning in and between different global commodity chains • Green Deal Sustainable Forest Management

⁴⁹ A trigger of innovation refers to factors stimulating or inducing an innovation process. A driver of innovation is what it keeps going and allows innovations to become attractive enough to become established practices.

Case	Triggers	Drivers	Barriers	Opportunities
			<ul style="list-style-type: none"> Costs of certification vs. competitive advantage for companies 	
Timber - Forest Stewardship Council (FSC) and ForCES certification	<ul style="list-style-type: none"> Societal pressure for forest conservation Value chain stakeholders need for credible systems to demonstrate sustainability ForCES: interest in voluntary PES schemes for ecosystems Awareness among FSC members that ES not dealt with in current FSC certification 	<ul style="list-style-type: none"> EU timber regulation Demand for certified timber products Promotion of PPPs Dutch public procurement policy for timber products Business increased access to environmentally sensitive markets, corporate and public buyers Price premiums for producers, processors and traders CSR, reputation management, risk management ForCES: additional revenue streams for sustainable forest management 	<ul style="list-style-type: none"> 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 The global financial crisis Uncertain growth of demand for certified forest products Costs of certification vs. competitive advantage for companies 	<ul style="list-style-type: none"> 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
Timber - Dutch Public Procurement Policy	Dutch and EU policy changes	<ul style="list-style-type: none"> Direct funding (TPAC) by Dutch government Promotion of PPPs Engagement of private sector 	<ul style="list-style-type: none"> High costs of certified products Weak monitoring of compliance with the criteria 	<ul style="list-style-type: none"> Green Deal Sustainable Forest Management
Timber - Reducing Emissions from Deforestation and Forest Degradation (REDD+)	UNFCCC meetings Netherlands is a large importer of tropical timber products from Indonesia	<ul style="list-style-type: none"> UN-REDD+ Program in Indonesia Advocacy by NGOs Dutch government aid to REDD+ Partnership & NGOs 	<ul style="list-style-type: none"> No evidence on the impact of REDD+ on forest management Immature market for ES Lack of independent verification Insecure land tenure Weak legal frameworks for land use planning Incomplete decentralization 	<ul style="list-style-type: none"> International funding (e.g. FCPF) Engagement of Dutch government in REDD+ as leverage to enhance ES Carbon credits as business opportunity for companies

The aim of this analysis is to provide the Dutch government with information to look beyond their current indirect involvement in initiatives to increase the sustainability of the cocoa, soy and palm oil value chains and 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.

Changes in framework conditions have predominantly triggered the innovations in the four cases presented in much the same way as the innovation cases from the tropical timber value chain presented by Van den Berg *et al.* (2013). The triggers include a 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. To a large extent market opportunities have driven the innovation process in terms of standards and certification. Increasing corporate and public consumer demand for certified products is believed to enable access to environmentally sensitive markets by using price premiums to reward producers, processors and traders for sustainable operations. Public-private partnerships are promoted by the Dutch government and through governmental agencies such as IDH. Funding of (inter)national development and environmental NGOs fuels the PES process.

The barriers to innovations also predominantly originate in the contexts in which the chains are embedded. For example, in the certification cases, the difficulties in valuing ecosystem services and the implicit attention to ecosystem services form a barrier. Similarly, the scale of certification and its costs (to both farmers and companies) 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 beneficiaries located in ecosystems providing these services can or should be excluded who may be unable to pay for the benefits (e.g. water, watersheds or non-timber forest products)⁵⁰.

Confirming Berdegue and Peppelenbos (2005), the following variables emerged as critical to enabling innovation in the chains studied:

- The meso and macro context strongly influence value chain stakeholders.
- The strategies (i.e. business models) stakeholders use are mainly platforms, partnerships, standards and procurement policies.
- Concrete incentives (i.e. the drivers) encouraged stakeholders in the chains to undertake innovation (e.g. public funding, management, inter-firm organizations).
- Information sharing about how the innovation evolved and emerged, its impacts over time, and critical successes further fed successes and continuance of the innovation.

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 and the institutional environment. 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 stakeholders in the form of public-private partnerships, and the promotion of financial and institutional support of the certification of tropical products. Although market stakeholders 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.

7.4 Governance and policy options for the Dutch government

Lessons derived from the cases are used to provide the following recommendations for the Dutch government on how to further integrate the sustainable use and maintenance of ES into the cocoa, soy, palm oil and timber value chains, as well as tropical commodity chains generally.

General

1. Consider developing a coherent policy implementation strategy that makes explicit the role of ecosystem services in concepts such as 'sustainable inclusive growth', 'natural capital' and 'green economic growth'.
2. Re-consider the mix of policy instruments used to stimulate sustainable product certification. Other instruments are needed to help the private sector respond to market opportunities for ecosystem services, for example by incentivizing demand for ecosystem services through fiscal

⁵⁰ See another WOT publication which forms 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.

incentives. A coherent approach across Ministries, particularly Economic Affairs and Foreign Affairs is needed.

3. The use of indirect policy tools to facilitate and endorse innovations, such as the PES pilot project in cocoa, has waned. The reasons for this are not clear in the policy discourse, it appears impacts insufficient or taking too long, and expectations may have been unrealistic.
4. Focus on ecosystem services impacted at other stages in the chain, not only production. Especially stages taking place in Netherlands (such as processing and consumption) provide a possibility for more influence and the use of a wider range of facilitating and supporting policy tools.
5. Knowledge on natural capital values and natural capital accounting (i.e. the costs and benefits) in tropical commodity chains is scarce (Van Beukering *et al.* 2014) and needs to be expanded to allow informed decision making.

The STAP, IDH and certification

1. There is a lot of inter-connectedness between the chain innovations and stakeholders, with many Dutch stakeholders signing up to the STAP initiatives and overlaps (many cocoa stakeholders are also engaged in soy and oil palm chains). This shows how critical IDH (and thus the Dutch government) is as a driving force in the cases considered. This is both a strength ('if IDH and partners pick up ES it can fly') and a weakness ('if IDH ignore ES then it's hard to get it off the ground'). This suggests that how IDH approaches ES is critical to their being addressed in current chain initiatives. A focus on not only the volume of certified products but also on the outcomes of certification could help prevent the erosion of the credibility of certification schemes.
2. Making clear how voluntary adherence to the sector wide Declarations of Intent upon which the STAP is monitored and encouraging the smaller, less organised sectors of the chains to participate can be a way to upscale impacts and reach commitments.
3. Re-consider indirect governmental involvement in standard setting for certification schemes, to ensure that ecosystem services are explicit and that the monitoring of the functioning of the systems and outcomes occurs, for example through the ISEAL Alliance initiative and through ISO standards.
6. Consider funding studies (perhaps through partnering with companies, civil society and research institutes), to show the impact of certification schemes on ecosystem services and of pilots exploring how ecosystem services can be further integrated into chains, including PES pilot projects for specific ecosystem services (alone or in bundles).
7. Certification (FSC, UTZ, RA, Fairtrade, Organic, RTRS and RSPO) is a common theme across the cases. The results, impact and coverage of certification however remains much contested. Continuing to encourage and support IDH, companies, certification schemes and observers to demonstrate the impacts and specifically and explicitly address ES in their standards is an option to convince policymakers of the effectiveness of supporting certification in addressing ecosystem services.
8. Support studies into the real costs and benefits of certification for different stakeholders in the chain i.e. producers, certifiers, companies and support organisations.
5. The certification cases suggest that the interrelated bundles of innovation (i.e. IDH, roundtables and their associated certification schemes) are good ways to indirectly address ES, but the debate needs to be broadened to stimulate more experiments, for example engaging indirect stakeholders who have been less involved so far.
6. Making ES explicit in easy to understand terms, and pinpointing where the government can lever changes (i.e. through IDH, though endorsing and supporting possible add-ons to certification schemes, and at home on energy consumption in processing and manufacturing, and though continued encouragement of consumers to buy 'guaranteed sustainable'.

Alternative policy instruments

Meijaard *et al.* (2013) see the value of certification of some ES but conclude that payments for others will remain 'minor niches that seldom justify major subsidies'. With this in mind the Dutch government needs to have a diverse portfolio of instruments that it employs to promote ES and increase the sustainability of agro-commodity value chains. The limits to the uptake of voluntary standards and the coverage possible by programmes such as IDH suggest that sustainability standard certification is not a magic, silver bullet to better integrate ecosystem services in commodity chains. A wider range of

instruments is recommended to ensure that ecosystem services are addressed in commodity chains. Options include:

1. Supporting pilots, for example, promising PES initiatives exist but testing of whether up scaling is possible is needed.
2. Testing landscape approaches to creating awareness of ES.
3. Consider legislation, taxation and fiscal instruments that create incentives for a preference for sustainable commodities.
4. Ensuring that government-supported schemes that finance (e.g. FMO, export credit) or invest in initiatives also focus on payment for ES or on sustainable production.
5. Support the enabling environment i.e. governments in countries of origin of the commodity chains in their attempts to enforce local laws that contribute towards ensuring sustainable chains, maintain and enhancing natural capital.

Value chain specific

Cocoa

6. The benefits to consumers of conserving ES in production countries can seem very far away. By also focussing on ES impacts and benefits of chain operations closer to home, consumers could be more engaged.

Soy and Palm Oil

9. Consider (more direct) government engagement in multi-stakeholder learning platforms such as those provided by the RSPO and RTRS, to increase consumer and business-to-business awareness of ecosystem services to change consumer preferences and purchasing decisions.
10. Support activities for a better enabling environment in soy producing countries. Distinctive strategies for each country, scale and region should be supported.
11. Support increased demand for sustainable soy through more direct government engagement in multi-stakeholder platforms at the national and international level.
12. Engage with soy value chain stakeholders in the US and China and seek agreement on an EU-wide standpoint.
13. Consider funding additional research into:
 - a. the measurement and comparison of alternative land use patterns and management practices and their relative impacts on biodiversity in palm and soy production landscapes;
 - b. a better understanding of the import and export flows of soy (and soy derivatives) into and out of the Netherlands;
 - c. the comparability of different sustainability standards to promote efficiency and to show impact of certification schemes on ES along with pilots into how ES can be further integrated into the soy value chain.
14. Consider clarifying and strengthening laws governing imports including fiscal incentives for the import of sustainably certified or ES friendly soy and palm oil.

References

- Abbott, P., M. Wilcox and W. A. Muir (2005). "Corporate social responsibility in international cocoa trade." Purdue University, West Lafayette.
- Adams, W. M. (2009). *Green Development. Environment and sustainability in a developing world*. London and New York, Routledge.
- Adekunde, A. A., J. Ellis-Jones, I. Ajibefun, R. A. Nyikal, S. Bangali, O. Fatnumbi and A. Ange (2012). *Agricultural Innovation in sub-Saharan Africa: experiences from multiple stakeholder approaches*. Accra, Ghana, FARA: 151.
- Agidee, Y. (2011). *Forest Carbon in Ghana: Spotlight on Community Resource Management Areas*. Katoomba Group's Legal Initiative Country Study Series. Washington, DC, Forest Trends: 37.
- Almekinders, C., T. Crane, B. Harms, J. Van den Berg and R. Fagbemissi (2012). *A review of IS theories and approaches and their significance for agricultural/rural innovation in small-scale farming in Africa Final draft report*. Wageningen, JOLISAA, WUR, CIRAD: 46.
- Alonghi, T. (2011). "Côte d'Cocoa The Political and Social Effects of Côte d'Ivoire's Cocoa Sector." *Jackson School Focus* 2(2): 62-.
- Anne Tallontire, V. N., Jami Dixon and Tim G. Benton (2012). *Review of the Literature and Knowledge of Standards and Certification Systems in Agricultural Production and Farming Systems*. NRI Working Paper Series on Sustainability Standards No. 2. Greenwich, NRI: 131.
- Arnouts, R. C. M., D. A. Kamphorst, B. J. M. Arts and J. P. M. v. Tatenhove (2012). *Innovatieve governance voor het groene domein. Governance-arrangementen voor vermaatschappelijking van het natuurbeleid en verduurzaming van de koffieketen*. WOt werkdocumenten Wettelijke Onderzoekstaken Natuur & Milieu306. Wageningen, Wageningen UR: 122.
- Arts, B. (2002). "'Green alliances' of business and NGOs. New styles of self-regulation or 'dead-end roads'?" *Corporate Social Responsibility and Environmental Management* 9(1): 26-36.
- BACP (2012). *Market Transformation Strategy for Cocoa*. I. F. C. I. Global Environment Facility (GEF), Japanese, Netherlands, Norway, Luxembourg, Italy and New Zealand Governments, Biodiversity and Agricultural Commodities Program (BACP): 34.
- Balmford, A., A. S. L. Rodrigues, M. Walpole, P. ten Brink, M. Kettunen, L. Braat and R. de Groot (2008). "The Economics of Ecosystems and Biodiversity: scoping the science." European Commission (contract ENV/070307/2007/486089/ETU/B2), Cambridge, UK.
- Barrientos, S. (2011). *Beyond Fair Trade: Why are Mainstream Chocolate Companies Pursuing Social and Economic Sustainability in Cocoa Sourcing*. Paper to ILO/IFC Better Work Conference.
- Bass, S. (2001). *Certification's impacts on forests, stakeholders and supply chains*. London, IIED.
- Bauhaus, J., P. Van der Meer and M. Kanninen, Eds. (2012). *Ecosystem goods and services from plantation forests*. London, New York, Earthscan.
- Beers, P. J., J. Sol and A. Wals (2010). *Social learning in a multi-actor innovation context*.
- Berdegue, J. A. and L. Peppelenbos (2005). "Keys to Inclusion of Small-Scale Producers in Dynamic Markets."
- Beukering, P. v., M. v. Drunen and O. Kuik (2013). *Valuing economic costs and benefits of the supply chain of cocoa, soy and palm oil*. Netherlands Environmental Assessment Agency (PBL), Institute for Environmental Studies: 104.
- Bhagwat, S. A. and K. J. Willis (2008). "Agroforestry as a Solution to the Oil-Palm Debate." *Conservation Biology* 22(6): 1368-1369.
- Biggs, S. (2007). "Building on the positive: an actor innovation systems approach to finding and promoting pro poor natural resources institutional and technical innovations." *International Journal of Agricultural Resources, Governance and Ecology* 6(2): 144-164.
- Bishop, J., S. Kapila, F. Hicks, P. Mitchell and F. Vorhies (2008). *Building Biodiversity Business*. S. I. L. a. t. I. U. f. C. o. Nature. London, UK, and Gland, Switzerland, Shell International Limited, International Union for Conservation: 164.
- Bisseleua, D., A. Missoup and S. Vidal (2009). "Biodiversity conservation, ecosystem functioning, and economic incentives under cocoa agroforestry intensification." *Conservation Biology* 23(5): 1176-1184.

- Bitzer, V., J. van Wijk, B. HELMSING and V. van der Linden (2009). Partnering to facilitate smallholder inclusion in value chains. EADI Seminar Promoting sustainable global value chains: the role of governance Maastricht School of Management, Maastricht School of Management.
- Blackman, A. and J. Rivera (2010). The Evidence Base for Environmental and Socioeconomic Impacts of 'Sustainable' Certification. Discussion paper SSRN 1579083, SSRN: 34.
- Blaikie, P. (1985). The political economy of soil erosion in developing countries, Longman.
- Bos, E. and T. Vogelzang (2010). "Effecten van vernatting Integrale afweging met een maatschappelijke kosten-batenanalyse." *Landschap-Tijdschrift voor Landschapsecologie en Milieukunde* 27(3): 175.
- Braat, L. C. and R. de Groot (2012). "The ecosystem services agenda: bridging the worlds of natural science and economics, conservation and development, and public and private policy." *Ecosystem Services* 1(1): 4-15.
- Brack, D. (2014). FLEGT, REDD+ and agricultural commodities. Linking FLEGT and REDD+ to improve forest governance. G. Broekhoven and M. Wit. Wageningen, The Netherlands, Tropenbos International.
- Bryant, R. L. and S. Bailey (1997). Third world political ecology. London, Routledge.
- Bulte, E. H., L. Lipper, R. Stringer and D. Zilberman (2008). "Payments for ecosystem services and poverty reduction: concepts, issues, and empirical perspectives." *Environment and Development Economics* 13(3): 245.
- Cardinale, B. J., K. L. Matulich, D. U. Hooper, J. E. Byrnes, E. Duffy, L. Gamfeldt, P. Balvanera, M. I. O'Connor and A. Gonzalez (2011). "The functional role of producer diversity in ecosystems." *American journal of botany* 98(3): 572-592.
- Casson, A. (2000). The hesitant boom: Indonesia's oil palm sub-sector in an era of economic crisis and political change. CIFOR. Bogor, Indonesia.
- Casson, A. T., L. and Deddy, K. (2007). Strategies to reduce carbon emissions from the oil palm sector in Indonesia. Paper prepared for the Indonesian Forest Climate Alliance. Jakarta.
- Christensen, V., J. Steenbeek and P. Failler (2011). "A combined ecosystem and value chain modeling approach for evaluating societal cost and benefit of fishing." *Ecological Modelling* 222(3): 857-864.
- Cocoa Barometer (2012). Cocoa Barometer. The Netherlands, VOICE Network, Berne Declaration, FNV, Südwind, HIVOS, Oxfam Werldwinkels, Oxfam Novib, Solidaridad, Stop the Traffik.
- Colchester, M., N. Jiwan, N. Andiko, M. Sariat, A. Y. Firdaus, A. Surambo and H. Pane (2006). "Promised Land. Palm Oil and Land Acquisition in Indonesia: Implications for Local Communities and Indigenous Peoples. Forest Peoples Programme Perkumpulan Sawit Watch, Huma and the World Agroforestry Centre, Bogor, Indonesia."
- COSA (2012). Côte d'Ivoire Cocoa: COSA Survey of Rainforest Alliance Certified Farms - 2009-2011. New York, Rainforest Alliance, COSA.
- COSA and ISSER (2013). Cocoa Farms in Ghana: An Evaluation of the Impact of UTZ Certification on the Sustainability of Smallholders Supported by the Solidaridad Cocoa Programme (2010-2012) Report, Committee on Sustainability Assessment (COSA) and Institute of Statistical Social and Economic Research (ISSER) University of Ghana: 60.
- Cundill, G. and C. Fabricius (2010). "Monitoring the governance dimension of natural resource comanagement." *Ecology and Society* 15(1): 15.
- Daily, G. C. and P. A. Matson (2008). "Ecosystem services: From theory to implementation." *Proceedings of the National Academy of Sciences* 105(28): 9455-9456.
- Danielsen, F., H. Beukema, N. D. Burgess, F. Parish, C. A. Bruhl, P. F. Donald, D. Murdiyarso, B. Phalan, L. Reijnders, M. Struebig and E. B. Fitzherbert (2009). "Biofuel Plantations on Forested Lands: Double Jeopardy for Biodiversity and Climate." *Conservation Biology* 23(2): 348-358.
- Devaux, A., D. Horton, C. Velasco, G. Thiele, G. Lopez, T. Ernet, I. Rienoso and M. Ordinola (2009). "Collective action for market chain innovation in the Andes." *Food Policy* 34(31): 38.
- Eberhard Krain, E. M., Edmond Konan, Eric Servat (2011). Trade and Pro-Poor Growth: Introducing Rainforest Alliance Certification to Cocoa Production in Côte d'Ivoire. Project, Aft category 2 (CRS code 25010). Eschborn, Germany, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- Edwards, D. P., T. H. Larsen, T. D. S. Docherty, F. A. Ansell, W. W. Hsu, M. A. Derhé, K. C. Hamer and D. S. Wilcove (2010). "Degraded lands worth protecting: the biological importance of Southeast Asia's repeatedly logged forests." *Proceedings of the Royal Society B: Biological Sciences*.
- Edwards, D. P. and W. F. Laurance (2013). "Biodiversity Despite Selective Logging." *Science* 339(6120): 646-647.

- Edwards, D. P., P. Woodcock, F. A. Edwards, T. H. Larsen, W. W. Hsu, S. Benedick and D. S. Wilcove (2012). "Reduced-impact logging and biodiversity conservation: a case study from Borneo." *Ecological Applications* 22(2): 561-571.
- Elzen, B., F. W. Geels and K. Green (2004). *System innovation and the transition to sustainability: theory, evidence and policy*, Edward Elgar Publishing.
- FAO (2007). *Governance, coordination and distribution along commodity value chains*. Rome, Trade and Markets Division, Food and Agriculture Organization of the United Nations: 297.
- FAO. (2014). "FAOSTAT." Retrieved March 2014, from <http://faostat.fao.org>.
- FAPRI. (2011). "FAPRI-ISU 2011 World Agricultural Outlook Database." FAPRI Staff Report 09-FSR 1, from <http://www.fapri.iastate.edu/tools/outlook.aspx>.
- Felperlaan, A., M. Ariesen and A. de Boer (2010). *Sustainable Cocoa for the Dutch Market Analysis of the Dutch cocoa sector. Analysis of the Dutch cocoa sector.*, CREM and IDH: 19.
- Fisher, B., K. Turner, M. Zylstra, R. Brouwer, R. De Groot, S. Farber, P. Ferraroerraro, R. Green, D. Hadley, J. Harlow, P. Jefferiss, C. Kirkby, P. Morling, S. Mowatt, R. Naidoo, J. Paavola, B. Strassburg, D. Yu and A. Balmford (2008). "Ecosystem Services and Economic Theory: Integration for Policy-Relevant Research." *Ecological Applications* 18(8): 2050–2067.
- Fitzherbert, E. B., M. J. Struebig, A. Morel, F. Danielsen, C. A. Brnhi, P. F. Donald and B. Phalan (2008). "How will oil palm expansion affect biodiversity?" *Trends in Ecology and Evolution* 23(10): 538-545.
- Forsyth, T. (2003). *Critical political ecology: the politics of environmental science*, Psychology Press.
- Freeman, C. (1987). *Technology Policy and Economic Performance: Lessons from Japan*. London, Pinter Publishers Ltd.
- Gereffi, G., J. Humphrey and T. Sturgeon (2005). "The governance of global value chains." *Review of International Political Economy* 12(1): 78–104.
- Gibbon, P. (2004). *Commodities, donors, value-chain analysis and upgrading*, International centre for trade and sustainable development (ICTSD).
- Global Witness (2007). *Hot chocolate: how cocoa fuelled the conflict in Côte d'Ivoire*. Washington DC, Global Witness: 72.
- Gradl, C. and B. Jenkins (2011). "Tackling Barriers to Scale: From Inclusive Business Models to Inclusive Business Ecosystems." Harvard Kennedy School: Corporate Social Responsibility Initiative.
- Greenpeace International (2013). *Certifying Destruction: Why consumer companies need to go beyond the RSPO to stop forest destruction*. Amsterdam, the Netherlands, Greenpeace International.
- Grigg, A., Z. Cullen, J. Foxall and R. Strumpf (2009). *Linking shareholder and natural value. Managing biodiversity and ecosystem services risk in companies with an agricultural supply chain*. Fauna & Flora International, United Nations Environment Programme Finance Initiative and Fundação Getulio Vargas.
- Guesnet, L., M. Müller and J. Schure (2009). *Natural Resources in Côte d'Ivoire: Fostering Crisis or Peace? The Cocoa, Diamond, Gold and Oil Sectors*. Bonn, Bonn International Centre for Conversion BICC: 84.
- Hein, L. and P. J. van der Meer (2012). "REDD+ in the context of ecosystem management." *Current Opinion in Environmental Sustainability* 4(6): 604-611.
- Helmsing, A. H. J. and S. Vellema, Eds. (2011). *Value Chains, Inclusion and Endogenous Development Contrasting Theories and Realities*. Abingdon, Routledge (Taylor & Francis Group).
- Hospes, O. (2014). "Marking the success or end of global multi-stakeholder governance? The rise of national sustainability standards in Indonesia and Brazil for palm oil and soy." 1-13.
- Howells, J. (2006). "Intermediation and the role of intermediaries in innovation." *Research policy* 35(5): 715-728.
- Humphrey, J. and H. Schmitz (2001). "Governance in Global Value Chains." *IDS Bulletin* 32(3): 17.
- ICCO (2013). "Cocoa year 2012/13." *ICCO Quarterly Bulletin of Cocoa Statistics XXXIX(2)*: 1.
- ICCO (2013). *Report International workshop on cocoa certification 22-24 June 2013, Douala, Cameroon*.
- ICCO (2013). "World cocoa bean production, grindings and stocks. Cocoa year 2012/13. 02-12-2013." *ICCO Quarterly Bulletin of Cocoa Statistics, Vol. No. 4, XXXIX(4)*.
- IDH (2012). *CPQP. The Cocoa Productivity and Quality Program*, IDH: 9.
- IDH (2012). *Position Paper Mainstreaming Sustainability in Tropical Timber Legality, sustainability, and the business case for frontrunner collaboration*. Utrecht, IDH: 16.
- IDH (2013). *Impact studies 2013. Sustainable markettransformation in action*. Utrecht, IDH, The Sustainable Trade Initiative.
- Ingram, V., Y. Waarts, L. Ge and G. Ton (2013). *Baseline & impact assessments & lessons learnt: UTZ Certified Ghana and Ivory Coast*. ICCO International Workshop On Cocoa Certification 24 June 2013, Yaoundé, Cameroon ICCO.

-
- Jack, B. K., C. Kousky and K. R. Sims (2008). "Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms." *Proceedings of the National Academy of Sciences* 105(28): 9465-9470.
- Johnson, B. and B. Lundvall (1992). "Closing the institutional gap?" *Revue d'économie industrielle* 59(1): 111-123.
- Kamphuis, B., E. J. M. M. Arets, C. Verwer, J. Van den Berg, S. van Berkum and B. Harms (2011). Dutch trade and biodiversity. The biodiversity and socio-economic impacts of Dutch trade in soya, palm oil and timber. LEI report 2011-013 and Alterra report 2155. The Hague, The Netherlands, LEI, Wageningen UR.
- Kaplinsky, R., O. Memedovic, M. Morris and J. Readman (2003). "The global wood furniture value chain: What prospects for upgrading by developing countries."
- Kaplinsky, R. and M. Morris (2000). *A handbook for value chain research*. Canada, IDRC.
- Keijzers, G. (2000). "The evolution of Dutch environmental policy: the changing ecological arena from 1970–2000 and beyond." *Journal of Cleaner Production* 8(3): 179-200.
- Koh, L. P. (2008). "Birds defend oil palms from herbivorous insects." *Ecological Applications* 18(4): 821-825.
- Koh, L. P. and D. S. Wilcove (2008). "Is oil palm agriculture really destroying tropical biodiversity?" *Conservation Letters* 1(2): 60-64.
- Koh, L. P. and D. S. Wilcove (2009). "Oil palm: disinformation enables deforestation." *Trends in Ecology & Evolution* 24(2): 67-68.
- KPMG (2012). *Certification and biodiversity. Exploring improvements in the effectiveness of certification schemes on biodiversity*, KPMG Advisory: 60.
- KPMG (2012). *Cocoa Certification A study on the costs, advantages and disadvantages of cocoa certification The Netherlands, The International Cocoa Organization (ICCO)*: 99.
- KPMG (2012). *TEEB voor het Nederlandse bedrijfsleven The Economics of Ecosystems & Biodiversity*, KPMG: 134.
- KPMG Sustainability (2013). *Improving smallholder livelihoods: Effectiveness of certification in coffee, cocoa and cotton*, SUSTAINEO. 126-2013\BH\JT\KS\bk: 65.
- Kucera, D. and R. Sarna (2004). *Child labour, education and export performance*. ILO Policy Integration Department Working Paper (52). Geneva, ILO.
- Läderach, P. (2011). *Predicting the Impact of Climate Change on the Cocoa-Growing Regions in Ghana and Cote d'Ivoire Final report. Decision and Policy Analyses (DAPA) program at the International Center for Tropical Agriculture (CIAT)*. Managua, Nicaragua, Climate Change Agriculture and Food Security, International Centre for Tropical Agriculture CIAT: 35.
- Lambooy, T. and Y. Levashova (2011). "Opportunities and challenges for private sector entrepreneurship and investment in biodiversity, ecosystem services and nature conservation." *International Journal of Biodiversity Science, Ecosystem Services & Management* 7(4): 301-318.
- Lauber, V. and V. Ingram (2000). *Packaging Waste. The voluntary approach to environmental policy: Joint environmental policy-making in Europe*. A. P. J. Mol, V. Lauber and D. Liefferink. Oxford, Oxford University Press: 104-155.
- Laven, A. and P. Pelders (2010). *Chocolate Forever. Dutch knowledge on sustainable cocoa IT Development Policy & Practice*. Amsterdam, Royal Tropical Institute.
- Leeuwis, C. and N. Aarts (2011). "Rethinking communication in innovation processes: creating space for change in complex systems." *Journal of Agricultural Education and Extension* 17(1): 21-36.
- Leibel, N. (2012). *Protecting biodiversity in production landscapes : a guide to working with agribusiness supply chains towards conserving biodiversity*. Pretoria, South Africa, UNDP: 80.
- Lucey, J., J. Hill, P. van der Meer, G. Reynolds and F. Agus (2014). *Change in carbon stocks arising from land-use conversion to oil palm plantations. A science-for-policy paper for the oil palm research-policy partnership network*. York, UK, University of York.
- Mantel, S., J. H. M. Wösten and J. Verhagen (2007). *Biophysical Land Suitability for Oil Palm in Kalimantan, Indonesia*. ISRIC Report 2007/01. Wageningen, ISRIC – World Soil Information.
- McNally, D. (2009). "From financial crisis to world-slump: accumulation, financialisation, and the global slowdown." *Historical Materialism* 17(2): 35-83.
- Meyer, C. B. (2001). "A Case in Case Study Methodology." *Field Methods* 13(4): 32-352.
- Millennium-Ecosystem-Assessment (2005). *Ecosystems and Human Well-being: Synthesis*. Washington, DC., Island Press,: 155.
- Ministry of Foreign Affairs (2010). *Dutch international support in the field of climate change*. Den Haag, Ministry of Foreign Affairs: 30.

- Minsitry of Forestry and Wildlife (2010). Database of community forests. F. C. MinFoF. Yaoundé:, Minsitry of Forestry and Wildlife.
- Montagnini, F. and P. Nair (2004). "Carbon sequestration: an underexploited environmental benefit of agroforestry systems." *Agroforestry systems* 61(1-3): 281-295.
- N'Dao, Y. (2012). Rationalités, changements de pratiques et impacts des standards durables sur les petits producteurs : le cas de la certification Rainforest Alliance dans le secteur du cacao en Côte d'Ivoire. Master Recherche 2 – A2D2 Agriculture, Alimentation et Développement Durable, Université Montpellier 1.
- Netherlands Government (2013). *Natural Capital Agenda: conservation and sustainable use of biodiversity*. Den Haag, Second Chamber of Parliament: 12.
- Nidumolu, R., C. Prahalad and M. Rangaswami (2009). "Why sustainability is now the key driver of innovation." *Harvard Business Review* 87(9): 56-64.
- Norgaard, R. B. (2010). "Ecosystem services: From eye-opening metaphor to complexity blinder." *Ecological Economics* 69(6): 1219-1227.
- Norris, K. (2010). Exploring the potential for cocoa carbon in Ghana. Centre for Agri-Environmental Research. Reading, University of Reading.
- Pagiola, S., A. Arcenas and G. Platais (2005). "Can payments for environmental services help reduce poverty? An exploration of the issues and the evidence to date from Latin America." *World Development* 33(2): 237-253.
- Panlibuton, H. and F. Lusby (2006). Indonesia cocoa bean value chain case study. Microreport #65. USAID: 16.
- Peters-Stanley, M., G. Gonzalez and D. Yin (2013). Covering new ground. State of the forest carbon market 2013. Washington, USA, Ecosystem Marketplace.
- Peters, C. M., A. H. Gentry and R. O. Mendelsohn (1989). "Valuation of an Amazonian rainforest." *Nature* 339(6227): 655-656.
- Pierce, A., P. Shanley and S. Laird (2003). Certification of non-timber forest products: Limitations and implications of a market-based conservation tool. The International Conference on Rural Livelihoods, Forests and Biodiversity. Bonn, Germany: 15.
- Pirard, R., R. Billé and T. Sembrés (2010). Questioning the theory of Payments for Ecosystem Services (PES) in light of emerging experience and plausible developments. Analyses; Biodiversity. IDDRI. Paris, Institut Du Développement Durable Et Des Relations Internationales: 24.
- Purnomo, H., P. Guizol and D. R. Muhtaman (2008). "Governing the teak furniture business: A global value chain system dynamic modelling approach." *Environmental Modelling & Software*: doi:10.1016/j.envsoft.2008.1004.1012.
- Rainforest Alliance (2011). Evaluating the results of our work. Cocoa Farms in Côte d'Ivoire Rainforest Alliance Certification on Cocoa Farms in Côte d'Ivoire.
- Ramage, B. S., D. Sheil, H. M. W. Salim, C. Fletcher, N.-Z. A. Mustafa, J. C. Luruthusamay, R. D. Harrison, E. Butod, A. D. Dzulkiply, A. R. Kassim and M. D. Potts (2013). "Pseudoreplication in Tropical Forests and the Resulting Effects on Biodiversity Conservation." *Conservation Biology*: n/a-n/a.
- Ramirez, O., E. Somarriba, T. Ludewigs and P. Ferreira (2001). "Financial returns, stability and risk of cacao-plantain-timber agroforestry systems in Central America." *Agroforestry Systems* 51(2): 141-154.
- Raudsepp-Hearne, C., G. D. Peterson and E. M. Bennett (2010). "Ecosystem service bundles for analyzing tradeoffs in diverse landscapes." *Proceedings of the National Academy of Sciences* 107(11): 5242.
- Ravikumar, A., K. Andersson, E. Mwangi, M. R. Guariguata and R. Nasi (2012). "Towards More Equitable Terms of Cooperation: Local People's Contribution to Commercial Timber Concessions." *International Forestry Review* 14(2): 157-176.
- Romijn, L. (2012). The Impact of Commodity Certification Review and overview of the existing Literature database LEI, Wageningen University.
- RSPO (2002). Minutes of preparatory meeting on the Round Table for Sustainable Palm Oil. December 17, Gland, Switzerland, Round table on Sustainable Palm Oil.
- RSPO (2002). Minutes of the Preparatory Meeting Hayes (London): September 20, 2002, Round table on Sustainable Palm Oil.
- RSPO (2003). Minutes of First Organizing Committee Meeting in London: 2003. October 4, 2004, Jakarta, Indonesia, Compiled by ProForest and Andrew Ng.
- RSPO (2004). Minutes for the first meeting of the RSPO Criteria Working Group. October 4, 2004, Jakarta, Indonesia, Compiled by ProForest and Andrew Ng.

- Ruf, F. and J.-L. Agkpo (2008). Etude sur le revenu et les investissements des producteurs de café et de cacao en Côte d'Ivoire Rapport final, Mai 2008, Cardno Agrisystems Limited – Lead Member of Agrisystems Consortium: 118.
- Schouten, G. and P. Glasbergen (2011). "Creating legitimacy in global private governance: The case of the Roundtable on Sustainable Palm Oil." *Ecological Economics* 70(11): 1891-1899.
- Schouten, G., P. Leroy and P. Glasbergen (2012). "On the deliberative capacity of private multi-stakeholder governance: the roundtables on responsible soy and sustainable palm oil." *Ecological Economics* 83: 42-50.
- Schroth, G. and J. A. McNeely (2011). "Biodiversity conservation, ecosystem services and livelihoods in tropical landscapes: towards a common agenda." *Environmental management* 48(2): 229-236.
- Shanley, P., A. Pierce, S. Laird and D. Robinson (2008). *Beyond Timber: Certification and Management of Non-Timber Forest Products*. Bogor, Indonesia, Center for International Forestry Research (CIFOR).
- Shean, M. (2009). "Indonesia: Palm Oil Production Growth To Continue " USDA Foreign Agricultural Service - Commodity Intelligence report Retrieved August 2009, from <http://www.pecad.fas.usda.gov/highlights/2009/03/Indonesia/>.
- Sheil, D., A. Casson, E. Meijaard, M. van Noordwijk, J. Gaskell, J. Sunderland-Groves, K. Wertz and M. Kanninen (2009). *The impacts and opportunities of oil palm in Southeast Asia: What do we know and what do we need to know?* Bogor, Indonesia, Center for International Forestry Research (CIFOR): 67.
- Smith, S. and S. Barrientos (2005). "Fair trade and ethical trade: are there moves towards convergence?" *Sustainable Development* 13(3): 190-198.
- Soto, G., J. Le Coq, F. DeClerck, J. Le Coq and J. Beer (2011). "Certification process in the coffee value chain: achievements and limits to foster provision of environmental services. Ecosystem services from agriculture and agroforestry: measurement and payment."
- Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012). *Toward Sustainability. The Roles and Limitations of Certification*. Washington, DC, RESOLVE, Inc.
- Stiglitz, J. E., A. Sen and J.-P. Fitoussi (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Paris: 292.
- Task Force Duurzame Palmolie (2010). *Manifesto of the Task Force Sustainable Palm Oil*. Rijswijk, the Netherlands.
- Te Velde, D. W., J. Rushton, K. Schreckenber, E. Marshall, F. Edouard, A. Newton and E. Arancibia (2006). "Entrepreneurship in value chains of non-timber forest products." *Forest Policy and Economics* 8(2006): 725-741.
- TEEB (2009). *TEEB – The Economics of Ecosystems and Biodiversity in Business and Enterprise*, United Nations Environment Programme: 429.
- TEEB (2010). *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB.*, UNEP.
- Tellis, W. (1997). "Application of a Case Study Methodology " *The Qualitative Report* 3(3).
- Ten Brink, P. (2002). "Voluntary environmental agreements." *Process, practice and future*.
- The Sustainability Consortium (2013). *Key Performance Indicator. Category: Cocoa*. University of Arkansas, Wageningen UR, ASU, University of Arkansas, Wageningen UR, ASU: 21.
- Ton, G., J. L. F. Hagelaar, A. Laven and S. Vellema (2008). *Chain governance, sector policies and economic sustainability in cocoa; A comparative analysis of Ghana, Côte d'Ivoire, and Ecuador*. Wageningen, Wageningen International: 40.
- Tulane University (2011). *Oversight of public and private initiatives to eliminate worst forms of child labour in the cocoa sector in cote d'Ivoire and ghana*, Payson Centre for international Development and technology Transfer, Tulane university: 154.
- Turner, E. C., J. L. Snaddon, R. M. Ewers, T. M. Fayle and W. A. Foster (2011). *The Impact of Oil Palm Expansion on Environmental Change: Putting Conservation Research in Context*. *Environmental Impact of Biofuels*. M. A. Dos Santos Bernardes, InTech.
- Turner, E. C., J. L. Snaddon, T. M. Fayle and W. A. Foster (2008). "Oil Palm Research in Context: Identifying the Need for Biodiversity Assessment." *PLoS ONE* 3(2): e1572.
- UTZ Certified (2009). *UTZ CERTIFIED Good Inside Code of Conduct For Cocoa Version 1.0 - April 2009*. Amsterdam, UTZ Certified Foundation: 33.
- UTZ Certified (2009). *UTZ CERTIFIED Good Inside Code of Conduct For Cocoa. Annex: Guidance Document. Version 1.0 - July 2009*. Amsterdam, UTZ Certified Foundation: 18.
- UTZ Certified (2014). *UTZ Certified Impact Report. Combining results from 24 external impact studies and data from UTZ Certified*. Amsterdam, UTZ Certified: 56.

- van Beukering, P., M. van Drunen and O. Kuik (2014). Valuing economic costs and benefits of the supply chain of cocoa, soy and palm oil. Amsterdam, the Netherlands, IVM Institute for Environmental Studies, VU University.
- van Tulder, R. (2008). Partnerships for Development, Lecture Series Research In Management Max Havelaar LectureS. Rotterdam, Rotterdam School of Management, Erasmus University.
- van Wensem, J. (2013). "Use of the ecosystem services concept in landscape management in the Netherlands." Integrated Environmental Assessment and Management.
- Venter, O., E. Meijaard, H. Possingham, R. Dennis, D. Sheil, S. Wich, L. Hovani and K. Wilson (2009). "Carbon payments as a safeguard for threatened tropical mammals." Conservation Letters 2(3): 123-129.
- Vermeulen, S. and N. Goad (2006). Towards better practice in smallholder palm oil production. Natural Resource Issues Series No. 5. London, UK, International Institute for Environment and Development.
- Vermeulen, W. and M. Kok (2012). "Government interventions in sustainable supply chain governance: Experience in Dutch front-running cases." Ecological Economics.
- Vermeulen, W., Y. Uitenboogaart, L. Pesqueira, J. Metselaar and M. Kok (2010). Roles of Governments in Multi-Actor Sustainable Supply Chain. Governance Systems and the effectiveness of their interventions. An exploratory study. The Hague/Bilthoven, The Netherlands, Netherlands Environmental Assessment Agency PBL: 92.
- Vermeulen, W. J. and S. Seuring (2009). "Sustainability through the market—the impacts of sustainable supply chain management: introduction." Sustainable Development 17(5): 269-273.
- Vermeulen, W. J. V. and M. T. J. Kok (2012). "Government interventions in sustainable supply chain governance: Experience in Dutch front-running cases." Ecological Economics 83(0): 183-196.
- Waarts, Y. and M. Kuit (2010). Does international sustainability certification support regional biodiversity conservation objectives? The case of rooibos production and Fynbos conservation in South Africa. Market, Chains and Sustainable Development Strategy & Policy paper #21, WUR: 17.
- Waarts, Y. and M. Kuit (2014). Costs and benefits of certification for small-scale producers in cocoa, coffee, cotton, fruit and vegetables. Wageningen, LEI & CTA: 50.
- Weiss, G., D. Pettenella, P. Ollonqvist and B. Slee, Eds. (2011). Innovation in Forestry Territorial and Value Chain Relationships. Wallingford, Oxfordshire, CABI.
- Wilcox, M. D. and P. C. Abbott (2004). Market power and structural adjustment: the case of West African cocoa market liberalization. American Agricultural Economics Association Annual Meeting.
- Wittmer, H., A. Berghöfer and P. Sukhdev (2013). "Poverty Reduction and Biodiversity Conservation: Using the Concept of Ecosystem Services to Understand the Linkages." Biodiversity Conservation and Poverty Alleviation: Exploring the Evidence for a Link: 36-51.
- Woodcock, P., D. P. Edwards, T. M. Fayle, R. J. Newton, C. V. Khen, S. H. Bottrell and K. C. Hamer (2011). "The conservation value of South East Asia's highly degraded forests: evidence from leaf-litter ants." Philosophical Transactions of the Royal Society B: Biological Sciences 366(1582): 3256-3264.
- Wunder, S. (2006). "The efficiency of payments for environmental services in tropical conservation." Conservation Biology 21(1): 48-58.
- Yin, R. K. (2009). Case Study Research: Design and Methods. California, Sage Publications.
- Zuidema, P. A., P. A. Leffelaar, W. Gerritsma, L. Mommer and N. P. R. Anten (2005). "A physiological production model for cocoa (Theobroma cacao): model presentation, validation and application." Agricultural Systems 84(2): 195-225.

Websites consulted:

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

Justification

This study was carried out and supervised by Jolanda van den Berg en Verina Ingram, LEI Wageningen UR. The research methods and research approach has been supervised by members of TEEB (The Economics of Ecosystems and Biodiversity), the ministry of Economic Affairs and the ministry of Foreign Affairs. Mark van Oorschot and Marcel Kok of PBL Netherlands Environmental Assessment Agency and colleagues of the PBL-study on tropical product chains have provided feedback on earlier drafts of this final technical report. Their comments have been considered and incorporated as much as possible in this final report.

The authors wish to thank everyone, but to persons being interviewed in particular, for their constructive contribution to this report.

Annex 1 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 stakeholders (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 stakeholders, institutions and processes of change

Verschenen documenten in de reeks Technical reports van de Wettelijke Onderzoekstaken Natuur & Milieu

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

WOT-technical reports zijn ook te downloaden via de website www.wageningenUR.nl/wotnatuurenmilieu

- 1 Arets, E.J.M.M., K.W. van der Hoek, H. Kramer, P.J. Kuikman & J.-P. Lesschen (2013). *Greenhouse gas reporting of the LULUCF sector for the UNFCCC and Kyoto Protocol. Background to the Dutch NIR 2013.*
- 2 Kleunen, A. van, M. van Roomen, L. van den Bremer, A.J.J. Lemaire, J-W. Vergeer & E. van Winden (2014). *Ecologische gegevens van vogels voor Standaard Gegevensformulieren Vogelrichtlijngebieden.*
- 3 Bruggen, C. van, A. Bannink, C.M. Groenestein, B.J. de Haan, J.F.M. Huijsmans, H.H. Luesink, S.M. van der Sluis, G.L. Velthof & J. Vonk (2014). *Emissies naar lucht uit de landbouw in 2012. Berekeningen van ammoniak, stikstofoxide, lachgas, methaan en fijn stof met het model NEMA*
- 4 Verburg, R.W., T. Selnes & M.J. Bogaardt (2014). *Van denken naar doen; ecosysteemdiensten in de praktijk. Case studies uit Nederland, Vlaanderen en het Verenigd Koninkrijk.*
- 5 Velthof, G.L. & O. Oenema (2014). *Commissie van Deskundigen Meststoffenwet. Taken en werkwijze; versie 2014*
- 6 Berg, J. van den, V.J. Ingram, L.O. Judge & E.J.M.M. Arets (2014). *Integrating ecosystem services into tropical commodity chains- cocoa, soy and palm oil; Dutch policy options from an innovation system approach*
- 7 Knecht, B., T. van der Meij, S. Hennekens, J.A.M. Janssen & W. Wamelink (2014). *Status en trend van structuur- en functiekenmerken van Natura 2000- habitattypen op basis van het Landelijke Meetnet Flora (LMF) en de Landelijke Vegetatie Databank (LVD). Achtergronddocument voor de Artikel 17-rapportage.*
- 8 Janssen, J.A.M., E.J. Weeda, P. Schippers, R.J. Bijlsma, J.H.J. Schaminée, G.H.P. Arts, C.M. Deerenberg, O.G. Bos & R.G. Jak (2014). *Habitattypen in Natura 2000-gebieden. Beoordeling van oppervlakte representativiteit en behoudsstatus in de Standard Data Forms (SDFs).*
- 9 Ottburg, F.G.W.A., J.A.M. Janssen (2014). *Habitatrichtlijnsoorten in Natura 2000-gebieden. Beoordeling van populatie, leefgebied en isolatie in de Standard Data Forms (SDFs)*
- 10 Arets, E.J.M.M. & F.R. Veeneklaas (2014). *Costs and benefits of a more sustainable production of tropical timber.*
- 11 Vader, J. & M.J. Bogaardt (2014). *Natuurverkenning 2 jaar later; Over gebruik en doorwerking van Natuurverkenning 2010-2040.*
- 12 Smits, M.J.W. & C.M. van der Heide (2014). *Hoe en waarom bedrijven bijdragen aan behoud van ecosysteemdiensten; en hoe de overheid dergelijke bijdragen kan stimuleren.*
- 13 Knecht, B. de (ed.) (2014). *Graadmeter Diensten van Natuur; Vraag, aanbod, gebruik en trend van goederen en diensten uit ecosystemen in Nederland.*
- 14 Beltman, W.H.J., M.M.S. Ter Horst, P.I. Adriaanse, A. de Jong & J. Deneer (2014). *FOCUS_TOXSWA manual 4.4.2; User's Guide version 4.*
- 15 Adriaanse, P.I., W.H.J. Beltman & F. Van den Berg (2014). *Metabolite formation in water and in sediment in the TOXSWA model. Theory and procedure for the upstream catchment of FOCUS streams.*
- 16 Groenestein, K., C. van Bruggen en H. Luesink (2014). *Harmonisatie diercategorieën*
- 17 Kistenkas, F.H. (2014). *Juridische aspecten van gebiedsgericht natuurbeleid (Natura 2000)*
- 18 Koeijer, T.J. de, H.H. Luesink & C.H.G. Daatselaar (2014). *Synthese monitoring mestmarkt 2006 – 2012.*
- 19 Schmidt, A.M., A. van Kleunen, L. Soldaat & R. Bink (2014). *Rapportages op grond van de Europese Vogelrichtlijn en Habitatrichtlijn. Evaluatie rapportageperiode 2007-2012 en aanbevelingen voor de periode 2013-2018*
- 20 Fey F.E., N.M.A.J. Dankers, A. Meijboom, P.W. van Leeuwen, M. de Jong, E.M. Dijkman & J.S.M. Cremer (2014). *Ontwikkeling van enkele mosselbanken in de Nederlandse Waddenzee, situatie 2013.*
- 21 Hendriks, C.M.A., D.A. Kamphorst en R.A.M. Schrijver (2014). *Motieven van actoren voor verdere verduurzaming in de houtketen.*



State of the Environment

Wettelijke Onderzoekstaken
Natuur & Milieu
PO Box 47
NL-6700 AA Wageningen
T +31 (0) 317 48 54 71
E info.wnm@wur.nl

ISSN 2352-2739

[www.wageningenUR.nl/
wotnatuurenmilieu](http://www.wageningenUR.nl/wotnatuurenmilieu)



The mission of WOT Natuur & Milieu is to carry out statutory research tasks on issues relating to nature and the environment. These tasks are implemented in order to support the Dutch Minister of Economic Affairs, who is responsible for these issues. The Statutory Research Tasks Unit for Nature and the Environment (WOT Natuur & Milieu) works on products of the Netherlands Environmental Assessment Agency (PBL), such as the Assessment of the Human Environment reports and the Nature Outlook reports. In addition, the unit advises the Ministry of Economic Affairs about fertilisers and pesticides and their authorisation, and provides data required to compile biodiversity reports to the European Union.

WOT Natuur & Milieu is part of the international expertise organisation Wageningen UR (University & Research centre). Its mission is 'To explore the potential of nature to improve the quality of life'. Within Wageningen UR, nine specialised research institutes of the DLO Foundation have joined forces with Wageningen University to help answer the most important questions in the domain of healthy food and living environment. With approximately 30 locations, 6,000 members of staff and 9,000 students, Wageningen UR is one of the leading organisations in its domain worldwide. The integral approach to problems and the cooperation between the various disciplines are at the heart of the unique Wageningen Approach.
