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# Voluntary Sustainability Certification and State Regulations: Paths to Promote the Conservation of Ecosystem Services? Experiences in Indonesia

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**Abstract:** The Forest Stewardship Council initiated a Forest Certification for Ecosystem Services (ForCES) project from 2011 to 2017 to improve and promote sustainable forest management addressing a range of ecosystem services. Three sites in Indonesia were included in the pilot. Whilst the development of the certification standard was largely the result of a partnership between the certification standard organization, civil society and research organizations, implementation and monitoring of the impact of this sustainability standard will entail interactions with state regulations. This study examined how voluntary certification, other market-based approaches and state regulations concerning ecosystem services in Indonesia interplay, particularly in the agenda setting and negotiation stage. Using the conceptual lenses of transition theory and state and non-state market-based governance, interrelationships between ecosystem services certification and regulations were found to be complementary and antagonistic. The majority of interrelations were complementary and supporting. However, antagonism exists where regulations do not address multiple land uses and when there are contradictions in how state regulations define ecosystem services. There was limited state involvement in developing the ecosystem services certification standard, with no substitution between the voluntary standard and regulations occurring. To scale and transition this innovatory standard from a niche to a sociotechnical regime level, it is recommended that market-driven governance arrangements at farm, forest concession and landscape level are developed in collaboration with national and local governments. Collaboration can create synergies to incentivize the acceptance, adoption and effectiveness of non-state market driven instruments to positively enhance the conservation of ecosystem services.

**Keywords:** ecosystem services; voluntary sustainability certification; state regulation; plural governance arrangements; Indonesia

## 1. Introduction

The Forest Stewardship Council (FSC) is an international organization providing a system for voluntary accreditation and independent third-party certification. This system allows certificate holders to market their forest products and services as the result of environmentally appropriate, socially beneficial and economically viable forest management. FSC sets the standards for the development and approval of FSC Stewardship Standards, based on the FSC Principles and Criteria and sets standards for the accreditation of conformity assessment bodies (also known as certification bodies) that certify compliance with FSC's standards. Based on these standards, FSC provides a certification system for organizations seeking to market their forest products as FSC certified. FSC certification

was arguably the first full-fledged forest-related global non-state market-driven (NSMD) governance arrangement (also known as private governance), created in 1993 through transnational environmental and social groups [1]. FSC certification recognizes responsible “sustainable” forest management through independently verified compliance with a set of underlying principles, criteria and indicators that delineate the ecological, social, economic and policy impacts resulting from forest management for specific objectives [2].

To tackle the threats to maintaining ecosystem services worldwide [3], FSC and partners developed and led the Forest Certification for Ecosystem Services (ForCES) project from 2011 to 2017. The project aimed to improve and promote sustainable forest management considering a range of ecosystem services and to address threats to ecosystem services by providing greater incentives to those practicing responsible forest management [4–6]. The ForCES project used the Millennium Ecosystem Assessment definition [3] that ecosystem services are the benefits people obtain from ecosystems, and includes provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth. The project was intended as a pilot to identify and certify multiple ecosystem services, test possible business models and study the benefits of certification on preservation of ecosystem services. In terms of business models, FSC sees payments for ecosystem services (PES) as a “market mechanism in which a voluntary transaction occurs between at least one buyer and at least one seller, in which payments are conditional on maintaining an ecosystem use that provides well-defined environmental services” [7]. FSC believe that standards and certification can provide transparency in the growing markets for ecosystem services, characterized by complexity in determining the quality and quantity of these services [7].

The project was developed and executed as a multi-stakeholder partnership with the Centre for International Forest Research (CIFOR) providing scientific support and backstopping, WWF Indonesia, SNV Vietnam, FSC Chile and the Asia Network for Sustainable Agriculture and Bioresources (ANSAB) as in-country partners, largely funded by a grant from the Global Environment Facility (GEF) of the United Nations Environment Program (UNEP). It was conducted in ten pilot sites in Indonesia, Chile, Vietnam and Nepal which covered a range of land-use types and status protected areas, forest concessions, conservation areas, small-scale farms and community-managed forest areas. Outcomes outlined at the beginning of the project were the development of scientifically tested and auditable ES indicators for assessing compliance with certification criteria, a methodology to assess social and environmental benefits of FSC certification, and the design of new certification business models for rewarding the provision of ecosystem services. Among these outcomes, the priority was to enable a global system for certifying ecosystem services as a tool to provide sufficient incentives to forestry stakeholders practicing sustainable forest management.

As a result of the ForCES project, in 2018 FSC developed new tools for global use on how ecosystem services are provisioned and certified, termed FSC Ecosystem Services Certification (hereafter abbreviated to FSC ES certification). The resulting standard and accompanying documents outline the compliance requirements for ecosystem services within FSC certification, as voluntary additions to FSC Forest Management Certification [8]. In Indonesia, as well as testing the concept in three project pilot sites, a diverse set of stakeholders were consulted on and drafted a national Ecosystem Services standard. The Ministry of Forestry of Indonesia was a member of the project international steering committee, providing political and strategic guidance. FSC ES certification can be seen as form of NSMD governance that addresses the provisioning and governance of multiple ecosystem services within a specified forested area. The certification standard is unique among voluntary sustainability standards in that it seeks to certify multiple ecosystem services in one spatially defined forested ecosystem. Given this context, this study sought to answer the following questions:

1. How are ecosystem services conceptualized in state regulations in Indonesia?
2. How are ecosystem services defined in the FSC ecosystem services certification?
3. What are the interrelationships between state regulations and FSC ecosystem services certification in Indonesia?
4. What opportunities and synergies exist between certification and regulations regarding ecosystem services in Indonesia?

## 2. Conceptual Framework: Governance and Transition Theory

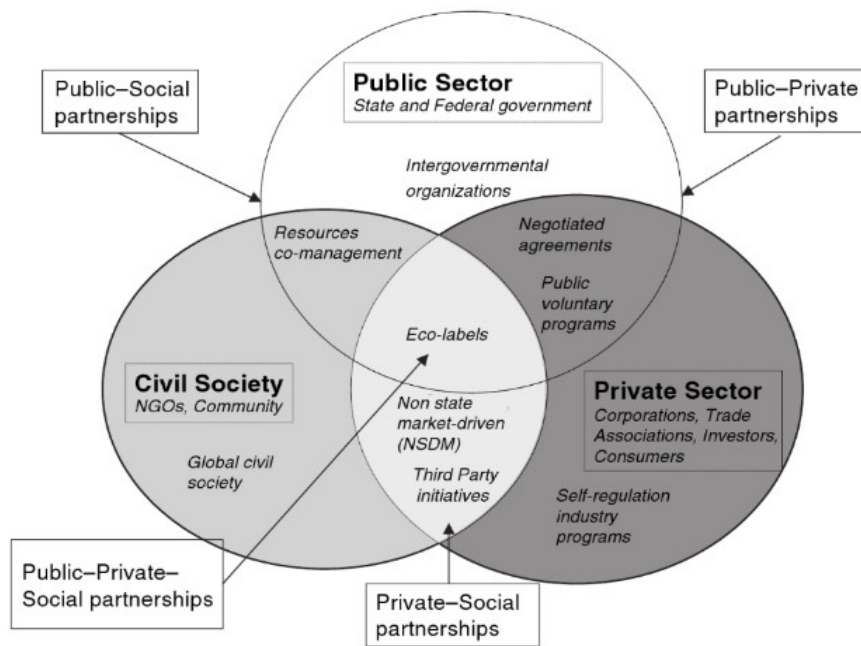
In this study, transition theory and governance are used as conceptual frameworks to understand how voluntary certification—as a form of market governance—and state regulations concerning ecosystem services evolved and interact in Indonesia, especially in the development stage of agenda setting and negotiation.

Laws and regulations have been the main forms of governance used by governments, juxtaposed with customary law by locals and traditional authorities [9]. Governance arrangements can also be driven by non-state actors, international markets and consumers' agency, with non-state governance increasingly emerging as an alternative to command and control mechanisms such as laws and regulations [10]. The term non-state market-driven governance covers a range of mechanisms, instruments and initiatives where the authority is located with market based actors, such as voluntary sustainability standards (also known as eco-certification), geographical indications, commodity roundtables, moratoria and payments for ecosystem services (PES) [11,12]. The growth in NSMD governance is paralleled by a trend towards monetization and commodification of ecosystem services, representing a shift from classical economic views of nature's benefits as use values towards a neoclassical economic conceptualization of exchange values [13]. Cashore et al. [11] suggest that NSMD governance excludes governments from formal participation in governance, as non-state actors govern all processes. However, state and non-state actors operating in the same sector can create overlapping interrelationships between policy instruments such as state regulations and voluntary standards, partnerships and corporate self-regulation programs—illustrated in Figure 1. For example, in the Netherlands non-state governance is used to complement state regulations, with adherence to voluntary sustainability standards actively promoted by the government for companies and stakeholders engaged in timber and other tropical commodity chains [14].

Interrelationships between policy instruments and sustainability tools have been seen as important to improve effective land use [10]. However, interactions between state and NSMD governance arrangements can cause difficulties in attributing the causality of impacts to specific policy instruments [10]. These interrelationships exist horizontally and vertically between stakeholders. The types and pathways of interrelationships between state governance and NSMD governance can occur at three stages in the regulatory process: agenda setting and negotiation, implementation, and monitoring and enforcement [15]. Lambin et al. [10] identified three main interactions—complementarity, substitution, and antagonism—occurring at these different stages. Complementarity indicates mutual interactions between two instruments—public regulations and sustainability standards are positively reinforcing—e.g., both governance instruments seek to fill the gaps of the other. Substitution is when non-state-driven regulations are adopted into state regulations. Complementarity and substitution may intertwine and overlap. Antagonism is when governance instruments conflict with each other at any stage of the process. Interrelationships between governance arrangements are often complex in practice with intricate constellations, bricolage and hybrids, involving other forms of governance alongside state and NSMD such as customary and project-based governance [16]. By defining these interrelationships, clarity can be provided on the interrelationships between certification and regulations [10]. As new forms of governance related to ecosystem services expand, this new grey space of governance raises questions on how well the certification of ecosystem services fits with and is situated within state regulations.

The concept of Payments for Ecosystem Services (PES) aims to incentivize land and forest owners to ensure a guaranteed flow of ecosystem services [17]. One form of NSMD governance of forest ecosystems that uses PES is the REDD+, which stands for Reducing emissions from deforestation and forest degradation, conservation of existing forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks. This international mechanism aims to reduce emissions from deforestation and forest degradation and enhance forest carbon stocks by financially rewarding beneficiaries in developing countries for emissions reductions associated with a decrease in the conversion of forests to alternative land uses. REDD+ finance can come from public and private, bilateral and multilateral sources. Payments by beneficiaries or users of an ecosystem service to the guardians or providers of that service can act as incentives and rewards to result in efficient, cost-effective and equitable conservation [18], and ensure the flow of benefits and ecosystem services [19]. Examples include calculated amounts of sequestered carbon in return for payments, and input-based payments based on management practices applied to restore or protect ecosystems [19]. Whilst PES for forest conservation has largely been conceptualized as a market-driven approach, it has been adopted in legislation, for example enabling a strong state role of the government in Vietnam whilst using a market-oriented approach [20].

A second useful lens to view the introduction of a new governance system, such as ecosystem services certification, is transition theory. This theory originates from the technological sector and seeks to understand complex sociotechnical transitions from an evolutionary economics perspective [21–23]. The resulting Multi-Level Perspective (MLP) on transitions has been employed in policy contexts to analyse conditions at regime, landscape and niche level (c.f. [24–26]). A transition is viewed in the MLP as a regime shift from one sociotechnical regime to another causing radical changes in existing systems. The term ‘radical’ addresses the speed—rather than the size—of changes. Radical changes may be sudden, incremental or slow. Niches are where new innovations, including policy instruments, are developed and radical novelties emerge. The MLP conceptualizes interests in the alignment of paths within levels. Levels are defined as interactions between processes with three levels identified: technological niche, sociotechnical regime and sociotechnical landscape. A sociotechnical regime refers to the coordination between technology and social groups, such as scientists, policy makers and users. Both niche and regime communities may share rules that coordinate actions. These rules may be stable and well-articulated for regimes, whereas for niche-innovations they are often unstable and emergent [23]. Three types of rules are recognized: cognitive (belief systems, guidance, goals, agenda, learning processes), regulative (regulations, standards, laws) and normative (role relationships, values and behavioural norms) [23]. Niches are where innovations, including policy instruments, are developed and radical change emerges. Actors’ ability to acquire knowledge and understand cognitions and activities make links between processes at different levels and highlight that the dynamics from an MLP are socially constructed. In the context of FSC ES certification, niches can be seen as incubators for creating and testing new sustainability tools [26]. FSC ES certification can be seen as a novel certification tool located at niche level. A transition to a regime level—the current law and regulations on ecosystem services—is driven by exogenous factors such as climate change, biodiversity deterioration and global policy initiatives tackling environmental degradation and deforestation such as REDD+ and payments for ecosystem services [26].



**Figure 1.** Overlapping public, private and social governance systems (Source: Delmas and Young p.8 [27]).

### 3. Materials and Methods

#### 3.1. Data Collection

Data was collected in two stages. For primary data, first a purposive sampling design accompanied by referral sampling was used to identify 21 key informants from the Indonesian government, FSC and partners in the ForCES initiative (WWF, CIFOR, United National Global Environmental Facility). The referral sampling process ended when informants did not suggest any new names or information. This resulted in visits to the ForCES project sites in Lombok, West and East Kalimantan (see Table 2) to conduct 13 semi-structured interviews in 2017 with national government officials, researchers, consultants and project implementers (timber companies, auditors, REDD+ proponents) involved in the ForCES project. The interviews were conducted in Bahasa and English using a guideline covering the four research questions.

Secondary data was gathered on three areas; (1) Indonesian state regulations published in official documents, policy documents, websites, databases, media and press releases; (2) FSC ES certification documents including FSC International Generic Indicators (IGIs), the ES Procedure and FSC Ecosystem Services Strategy based on literature provided by FSC and partners on the standard. At the time of the fieldwork the project was ongoing and the standard was under development, with the first public consultation on the standard completed and the second draft under public consultation; (3) Documents on NSMD initiatives concerning forest ecosystems such as REDD+ and PES projects, corporate commitments and multi-stakeholder initiatives in Indonesia indicating the possibilities, shortcomings, synergies and opportunities of how REDD+ and PES sites could become certified by ForCES. The review of relevant literature also aimed to deepen understanding and triangulate the interview data.

#### 3.2. Content Analysis

The interview transcripts and literature on regulations and FSC certification were read and analysed for specific mentions of ecosystem services in general and the specific services within the categories of provisioning, supporting, regulating and cultural services [3]; definitions of ES, the scope of these ES and the policies, strategies and rules related to ES. Keywords were manually coded using



a two-stage thematic analysis framework, with codes allocated based on meaningful expressions and single or short sequences of words and sentences. Content was first categorized under the headings of laws (*Undang-Undang* or UU), government regulations in lieu of law (*Peraturan Pemerintah Pengganti Undang-Undang* or *Perpu*), government regulation (*Peraturan Pemerintah* or PP), ministerial regulation (*Peraturan Menteri*), ministerial decrees (*Keputusan Menteri* or *Kepmen*) and circulation letters (*Surat Edaran*). The review of regulations was limited to Ministerial level regulations (rather than provincial and local level) to provide a picture of how state regulations governing ecosystem services are implemented on a national level. FSC normative documents were classified and coded as Policy, Standard, Directive, Advice Note, Procedure, Interpretation, Guidance Document and National Standard. The ForCES documents consisted of the Procedure and Guideline (FSC-PRO-30-006 V(1-0) Ecosystem Services Procedure: Impact Demonstration and Market Tools [28] and FSC-GUI-30-006 V(V1-0) Guidance for Demonstrating Ecosystem Services Impacts [29]). Multiple coding was possible for each document. In the second categorization stage, documents were classified according to the four research questions and analysed according to the type of ecosystem service mentioned in the document, using the Millennium Ecosystem Assessment framework of ecosystem services of provisioning, supporting, regulating and cultural services [3]. The interactions between NSMD arrangements and state regulations were analysed using the typology of potential interactions between public, private and hybrid instruments used in the agenda setting and negotiation phase of land use governance developed by Lambin and colleagues [10].

#### 4. Results

The results of the document reviews combined with interviews provide a picture of how ecosystem services are dealt with in state regulations and in non-state market-based standards.

##### 4.1. Ecosystem Services in Indonesian State Regulations

Shown in Table 1, ecosystem services were specified explicitly in 19 state regulations (grouped according to laws, governmental and ministerial regulations). Whilst 11 of the regulations mentioned all four types of ecosystem services, regulating services were the most mentioned (16), followed by supporting (14), provisioning (13) and cultural services (12). No mention of ecosystem services specifically was found in ministerial decrees or circulation letters. Two main laws regulate forestry in Indonesia: No. 5/1990 on Ecosystem and Nature Conservation and No. 41/1999 on Forestry, together forming the basis for the series of technical governmental regulations and ministerial regulation shown in Table 1. Law No.5. covers how to manage and conserve supporting ecosystem services, exotic plants and wildlife including allowable utilization under certain conditions and monitoring of hunting, trading and research. This law does not explicitly mention the term ecosystem services. It states the types of organizations that can govern the ES such as national parks, nature parks, forest parks, nature sanctuaries and wildlife reserves. Law No. 41 defines forests as “a unity of ecosystem in the form of landscape containing biological resources dominated by trees in the natural alliance of its environment, which one cannot be separated”. Thus, ES are embedded in Indonesian forest law, as forest products alongside the biotic and abiotic functions such as plants and soils, and comprise tourism, water and the beauty of nature.

However, not all these laws define or deal with ecosystem services consistently. Government Regulation No. 46/2017 on Environmental Economic Instruments explicitly explains the scope of environmental services (using the term environmental rather than ecosystem), whereas Government Regulation No. 28/2011 on Nature Conservation and Preservation Management mentions tourism, water and carbon as a part of ecosystem services without explaining the scope of these ecosystem services. Article 6 of Law No. 41/1999 states that forests have three functions: conservation (due to their biodiversity), protection (for their ecological functions) and production (for timber or for future conversion). Regulations No.45/2004 on Forest Protection, No. 44/2004 on Forest Planning, No. 6/2007 jo PP3/2008 Forest Management, Planning and Utilization, No. 46/2017 on Environmental

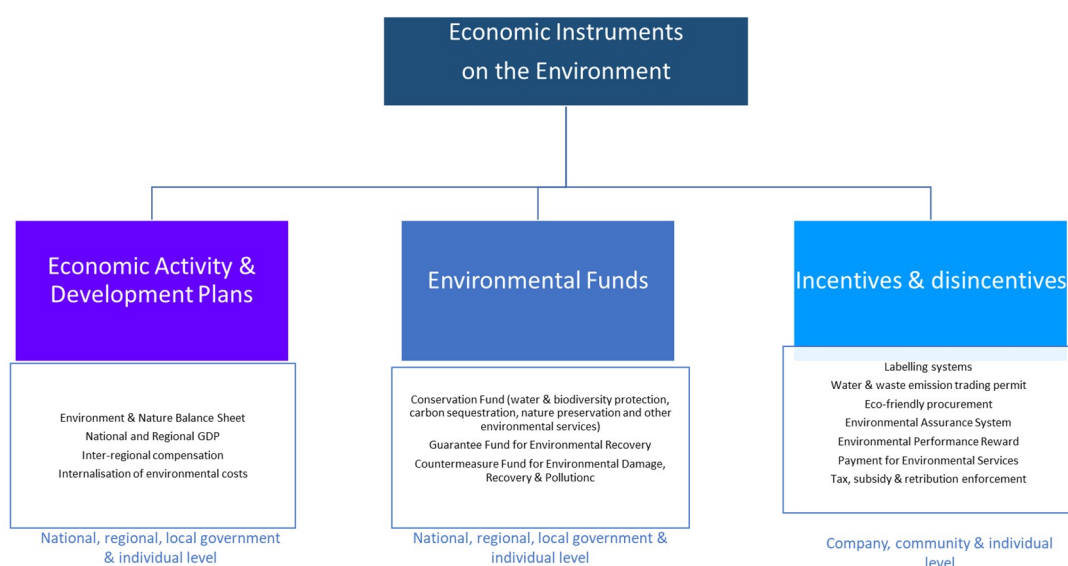
Economic Instruments, and No. 28/2011 on Nature Conservation and Preservation Management all have different interpretations of forests and ES. The first three regulations govern provisioning services, with timber and non-timber forest products the most mentioned. Regulation No. 28/2011 governs nature conservation and preservation management but does not explicitly mention ES, but forest services are addressed using the terms wildlife and unique ecosystems. Regulation No. 46/2017 specifically defines environmental services as benefits derived from ecosystem and environment for human beings and for survival inter alia resource provision, regulating services, natural processes, and cultural preservation. The Law No. 32/2009 on Environmental Protection and Management governs natural resources, human health, economic growth, energy, transportation, agriculture, industry and international trade with the aim of minimizing environmental impacts, by requiring an Environmental Impact Assessment of potentially harmful activities. However, Perpu No.1/2004 which amended the 1990 Law on Forestry, allows mining in state forests established before the 2004 law was enacted.

**Table 1.** Indonesian state regulations addressing ecosystem services.

Type of regulation	Type of Ecosystem Services			
	Provisioning	Supporting	Regulating	Cultural
<b>Laws</b>				
5/1990 Ecosystem and Nature Conservation	x	x	x	x
41/1999 Forestry	x	x	x	x
32/2009 Environmental Protection and Management	x	x	x	x
17/2004 The Ratification of Kyoto Protocol to the UNFCC			x	
<b>Regulations</b>				
Regulation in Lieu of Law No.1/2004 Amendment of Law No.41/1999 on Forestry	x	x	x	x
No.45/2004 Forest Protection	x	x	x	x
No. 44/2004 Forest Planning	x	x	x	x
No. 6/2007 jo PP3/2008 Forest Management, Planning and Utilization	x	x	x	x
No. 28/2011 Nature Conservation and Preservation Management		x	x	x
No. 46/2017 Environmental Economic Instrument	x	x	x	x
<b>Ministerial Regulation</b>				
P.68/2008 The Implementation of Demonstration Activities on Reducing Emission from Deforestation and Forest Degradation			x	
P.42/2009 Template, Criteria, and Standard on Water Catchment Area Management	x	x	x	
P.6/2009 Establishment of Forest Management Unit	x	x	x	x
P.36/2009 Procedures for Licensing for Commercial Utilization of Carbon Sequestration and/or Storage in Production and Protected Forests	x	x	x	
P.30/2009 The Implementation Procedures of Reducing Emissions From Deforestation and Forest Degradation (REDD)	x	x	x	
P.6/2010 Norms, Standard, Criteria, and Procedure Forest Management on Production and Protected Forest	x	x	x	x
P.22/2012 Business Guideline for Tourism Activity on Protected Forest				x
P.31/2016 Business Guideline for Tourism Activity on Production Forest				x

Key: x indicates that one or more ecosystem services are explicitly mentioned in the regulation.

Eight years after being mandated in Articles 42 and 43 of Law No. 32/2009, Government Regulation No. 46/2017 on Economic Instruments on the Environment was adopted. This regulation explicitly defines environmental services as “the benefits of ecosystems and the environment for human beings and the survival of life which includes the provision of natural resources, natural and environmental arrangements, advocates of natural processes, and the preservation of cultural values”. The regulation seeks to improve accountability and law enforcement on environmental protection and management by changing the behaviour of the government concerning economic and development activity; requiring systematic, measurable and structured funding scheme; and encouraging and gaining international and public trust on managing environmental funds. However, the regulation does not explain how to measure the benefits of environmental or ecosystem services or how to measure the impacts of restoration and conservation activities. Three main economic instruments are identified in the regulation, shown in Figure 2. The first instrument, Economic Activity and Development Plans, aims to internalize environmental externalities at national, regional and local scale. The second instrument, the Environmental Fund, acts as a monetary redirecting process between the government as environmental provider and individuals as beneficiaries through a performance-based agreement to increase environmental services, operating on different levels. Compensation can be monetary or non-monetary based on the costs of environmental conservation, community empowerment and implementation, which can be paid to the ecosystem services provider through grant mechanisms, based on criteria including proof of land ownership, authority to provide, generate and increase environmental services and measurable valuation. Compensation can fund restoration, conservation, biodiversity enrichment, community capacity improvement on environmental protection, renewable energy, sustainable economic development and its supporting infrastructure. Compensation can be financed from national or regional budgets, or from other sources. The third set of instruments aim to provide incentives and disincentives through a range of mechanisms such as taxes, subsidies and permits for non-governmental actors to protect environment and limit environmental degradation by reducing liability, easing implementation, facilitation and assistance; guidance and support, and acknowledgement and promoting corporate public performance beyond that required in laws to apply sustainable consumption and production.



**Figure 2.** Visualization of Government Regulation No. 46/2017 on Economic Instruments on the Environment.

In 2009, the Government participated in two international initiatives to support REDD+ readiness: The World Bank’s Forest Carbon Partnership Facility and the UN-REDD Programme. At the national level, a REDD+ strategy was developed and a legal framework to regulate REDD+ was established



by Ministerial Regulation P.30/2009 for the Implementation Procedures of Reducing Emissions from Deforestation and Forest Degradation (REDD). This regulation provides a national reference emission level and system to monitor greenhouse gas removals and emissions from forests. At the sub-national level, several provincial governors are strong supporters of the REDD+ concept and have issued decrees, established working groups and encouraged the involvement of external, non-governmental actors to promote REDD+ activities.

The Indonesian regulations that address ES have in part been triggered by international agreements such as the United Nations Framework Convention on Climate Change (UNFCCC) and Convention on Biological Diversity (CBD) which led to Ministerial Regulation P.30/2009. The implementation of REDD provoked Ministerial Regulation P.36/2009 Procedures for Licensing for Commercial Utilization of Carbon Sequestration and/or Storage in Production and Protected Forests, the 2009 Government pledge to cut greenhouse gas (GHG) emissions by 2020 and National Action Plan Addressing Climate Change. Prioritization of forest rehabilitation in the National Medium-Term Development Plan 2010–2014 stems from the UNFCCC COP 13 in Bali to implement the Kyoto Protocol. Laws that facilitate REDD+ have been enacted: guidance for REDD+ pilot projects (Ministerial Decree P68/2008); mechanisms for reducing emissions from deforestation and degradation (Ministerial Decree P30/2009) and Ministerial Regulation P20/2012 setting principles and criteria for demonstration activities, rights and obligations of forest carbon project proponents.

#### *4.2. Ecosystem Services Governance by Non-State Market-Driven Initiatives*

##### *4.2.1. A Voluntary Sustainability Standard: FSC Ecosystem Services Certification*

The most recent FSC Principles and Criteria document (FSC-STD-01-001 V5-2) from 2015 [30] is explicit in defining ecosystem services as “The benefits people obtain from ecosystems including provisioning services such as food, forest products and water; regulating services such as regulation of floods, drought, land degradation, air quality, climate and disease; supporting services such as soil formation and nutrient cycling; and cultural services and cultural values such as recreational, spiritual, religious and other non-material benefits”. Additional incentives for forest owners and managers to address ES were seen as needed, given the focus on exploiting timber in the FSC standards. FSC and the ForCES partners recognized that forests also provide other goods and services and that beneficiaries of forest ecosystem services and products can be any person, group of persons or entity that uses or is likely to use the benefits, which can include persons, groups of persons or entities located around forest areas such as local communities, indigenous peoples, forest dwellers, neighbours, downstream water users, tenure and use rights holders. In the ES Procedure, end users such as consumers or indirect beneficiaries of carbon mitigation are however not considered as beneficiaries [31].

Given this context, the ForCES project [4–6] sought to provide additional incentives to forest owners and managers and community-based forest organizations to promote sustainable forest management and set aside forest areas to protect biodiversity in intact landscapes. The aim of the project was to adopt FSC standards to emerging ecosystem services markets and target ecosystem services with present or future market potential and to generate and distribute income from ecosystem services besides from timber to forest concession owners and managers. After planning and implementing management activities to protect or restore ecosystem services at the three ForCES project pilot sites (shown in Table 2), developing impact indicators and establishing methodologies for monitoring these, these tools were tested and developed through certification of the sites and identifying business models of who would pay for the certified ecosystem services, how, and how much for each ecosystem service at each site. Of the three sites, stakeholders in one (West Kalimantan) decided not to pursue FSC ES certification.

**Table 2.** Forest Certification for Ecosystem Services (ForCES) Forest Stewardship Council (FSC) Certification project pilot sites Indonesia.

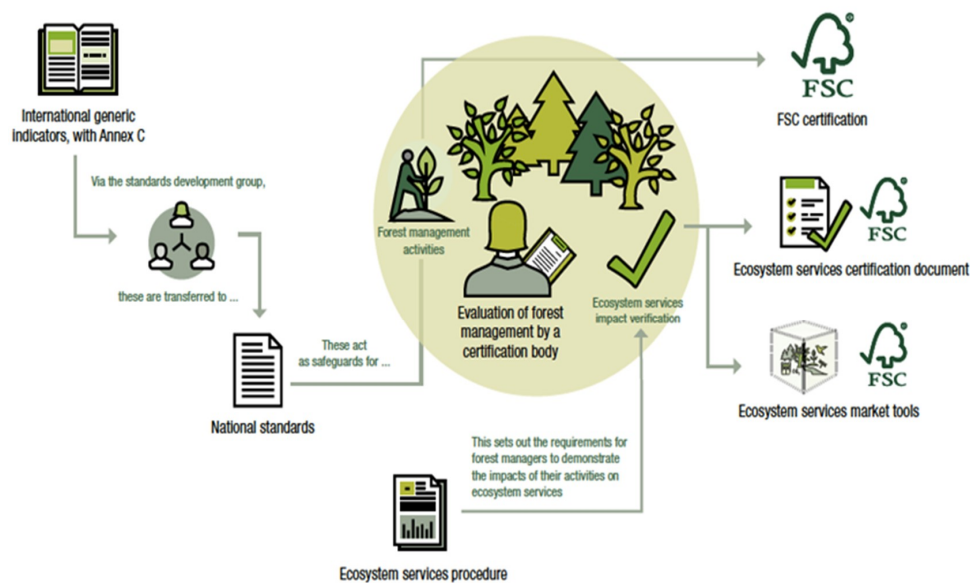
Site Name	Forest Type	Area in Hectares (ha)	Governance Model	Ecosystem Services Being Managed
Lombok	Semi-evergreen tropical mountain forest	3036 ha (185 FSC certified)	Managed by four community forest groups Government owned Forest Management Unit ( <i>Kesatuan Pengelolaan Hutan</i> )	Watershed services
East Kalimantan	Natural tropical forest (lowland and highland Dipterocarp)	93,425 ha (84,850 FSC certified 15,857 ha Protected area)	Privately owned forest concession logging company PT. Ratah Timber Protected area	Biological diversity conservation Carbon sequestration and storage
West Kalimantan	Natural tropical forest and lake	7076 ha	Government owned Forest Management Unit ( <i>Kesatuan Pengelolaan Hutan</i> ) National Park Ecotourism areas managed by communities in two villages, collaborative management approach	Biological diversity conservation Recreational services

During the project, an FSC Ecosystem Services Procedure was established and a policy document published in May 2018. This procedure established new tools to strengthen incentives for the protection of ecosystem services. FSC sees its certification as providing businesses with a ‘safeguard model’ providing a guarantee to potential buyers of FSC-certified products about how social, environmental and economic values are protected in forests. To effectively apply this to emerging markets for ecosystem services, FSC-certified forest management unit (FMU) concession holders and managers needed to augment this with information about the quantity of the ecosystem service, known as a ‘quality model’. The FSC ES certification aimed to do this by develop its own systems and tools for quantifying ecosystem services and incorporating systems developed by other single ecosystem service standards (e.g., Verified Carbon Standard, Gold Standard Foundation). The first tool is the FSC Ecosystem Services Procedure, which allows FSC certificate holders to demonstrate the impact of their forest management activities on ecosystem services. Once impacts are verified, FSC certificate holders can make Ecosystem Services Claims, to provide governments, investors, buyers and businesses with assurance that the impacts they are paying for do preserve ecosystem services. These procedures were included in the FSC global strategy as Annex C, as an addition to FSC’s International Generic Indicators. FSC saw this as enabling the promotion and wider adoption of ES tools, riding on the broad interest in ecosystem services among FSC network members [5]. Previously ES had been mainly addressed in FSC Principle 9 on the Maintenance of High Conservation Value Forests. ES certification therefore became embodied as an FSC standard (FSC-STD-60-004 V1-0 EN International Generic Indicators), procedures (FSC-PRO-30-006 Demonstrating the Impact of Forest Stewardship on Ecosystem Services), a discussion paper (FSC-DIS-30-006 Market Tools and Trademark Use for Demonstrated Ecosystem Services Impacts) and guideline (FSC-GUI-30-006 Guidance for demonstrating ecosystem services impacts).

FSC ES certification can be adopted by privately-owned forest concessions and community-owned forests if they can prove their ability to demonstrate their environmental activities. Figure 3 shows how FSC ES certification can be obtained by forest owners and the focus on ES in FSC certification.

ES certification was seen by FSC and partners as part of a broader strategy to increase the market value of responsibly managed forests and the FSC brand. The explicit attention to ES emphasizes the verification of the outputs, outcomes and impacts of managing and governing forests to maintain and improve ecosystem services. A measurable and verifiable theory of change adapted to the local context is compulsory for forest concession holders seeking FSC ES certification, with assessment methods aiming to be credible through their third-party nature and being replicable due to being based on verifiable information such as scientific publications.

Stakeholders in the ForCES project sought to stimulate one complementary regulatory process supporting ES. WWF Indonesia worked with the government of Lombok to formulate regulations concerning tourism in a protected area.



**Figure 3.** The envisaged FSC Ecosystem services certification process when the research was conducted [32]. Source: [7]. Note that this differs from the final system regarding national standards and Annex C.

Interviewees (state and non-governmental actors) mentioned concerns about the legitimacy of voluntary sustainability standards in general affecting the perception of FSC ES certification. Examples given included the Round Table for Sustainable Palm Oil (RSPO) certification; the Indonesian Sustainable Palm Oil certification (ISPO) standard, where the government is the certification standard owner and has revoked certification for companies not complying with the ISPO standard [33]; and cases where the FSC had disassociated itself from timber companies, even though timber was harvested from FSC-certified forests [34]. The existence of government owned ISPO standard alongside voluntary standards such as RSPO was also stated by interviewees as creating confusion among public, consumers and private sector.

#### 4.2.2. Payment for Ecosystem Services projects

At least 39 PES projects have commenced in Indonesia [35,36]. The majority (32) were REDD+ projects, implemented by non-governmental organizations and private sector, and were mostly in the design or early implementation stage at the time of study, with the oldest originating from 2001. These projects focus on two ecosystem services: carbon and watershed protection [19]. The PES projects have been developed by small number of stakeholders and communities in sites in Lombok, Kapuas Hulu, West Kalimantan and East Kalimantan. Private sector enterprises and a state company were involved in five projects as buyers and used carbon offsetting systems as part of corporate social responsibility schemes, mainly to avoid planned deforestation.

#### 4.2.3. Corporate Commitments and Multi-Stakeholder Initiatives

Other forms of NSMD mentioned in interviews were zero-deforestation commitments: corporate pledges advocating responsible sourcing of agricultural value chain commodities to end deforestation. Starting in 2013, pledges were made by palm oil, pulp and paper companies termed “No Deforestation, No Peat, No Exploitation” (NDPE). Most were at a definition level (such as the Accountability Framework) or identification level (the as High Carbon Stock Approach (HCSA) and forest monitoring by Global Forest Watch and WWF). State regulations, such as the extended 2017 Moratorium on primary forest clearing and conversion of peatlands, 2016 Palm oil permit moratorium, the Peatland Restoration Agency and 2014 Plantation Act further stimulated private-NGO-civil society and research partnerships and commitments. These were later endorsed by the Deputy Director for International

Cooperation and Climate Change Finance at the Ministry of Finance of Indonesia [37]. Many of these initiatives have since converged to become jurisdictional multi-stakeholder initiatives involving government, companies, and civil society at subnational level, such as the South Sumatra Eco-Region Alliance/Partnership Consortium for Landscape Management and the Central Kalimantan Commitment to Sustainable Palm Oil [38,39].

## 5. Discussion: Interrelationships between State and Non-State Ecosystem Services Governance Arrangements, Opportunities and Synergies

Transition theory emphasizes that changes cannot be expected to happen overnight or substantially at the local, national, regional or global scale. The empirical results of this study reflect this, showing how after seven years FSC ES certification is still in its infancy. In comparison, FSC forest management certification, one of the oldest voluntary sustainability standards, has taken over two decades to become mainstreamed as a form of NSMD recognized in production landscapes and consumer markets [15,40]. ES certification was developed as an add-on to FSC certification. This pairing strategy aims to speed adherence to voluntary sustainability certification instruments and uptake from a niche to regime level. FSC is trying to elevate the ES concept to more tangible practices to demonstrate that restoration and conservation activities positively impact the provision of ecosystem services, evidenced in terms of the pledge in the FSC Global Strategy 2015–2020. FSC ES certification can thus be seen as a new social-technical system innovation which may take place in the next 20 to 30 years. This prediction is based on FSC Forest Management certification and Chain of Custody certification taking around 20 years to become one of the most widely adopted voluntary sustainability certification schemes in the world [15,41].

### 5.1. Interactions between Non-State Governance and Indonesian State Regulations on Ecosystem Services

Transition theory predicts that the planning of novel practices and structural change presuppose each other [23]. In this case in Indonesia, FSC ES certification as a novel practice and governance arrangement was found to have complementarities and antagonisms with state regulations, and no collaboration. Examples of other forms of NSMD governance – voluntary certification standards for commodities and single ecosystem services, PES projects and corporate commitments are also provided. These interactions are summarized in Table 3, using the typology of interactions conceptualized by Lambin and colleagues [10].

#### 5.1.1. Complementary Interrelations

Several complementary interrelations were found. Multilateral, international environment agreements are known to be important triggers in forming new and reformed regulation which demonstrates international commitments [42]. In this case, Indonesian regulations addressing ES were triggered by international agreements such as the UNFCCC, CBD, REDD and Kyoto Protocol. State regulations, particularly on Environmental Economic Instruments, created a legal entrance point and enabling condition for market driven governance arrangements, such as the FSC ES certification. However, whilst the Economic Instruments Law specifies “ecolabels”, it does not explicitly specify voluntary sustainability standards, such as FSC ES certification, nor FSC or RSPO where specific ecosystem services are also made explicit.

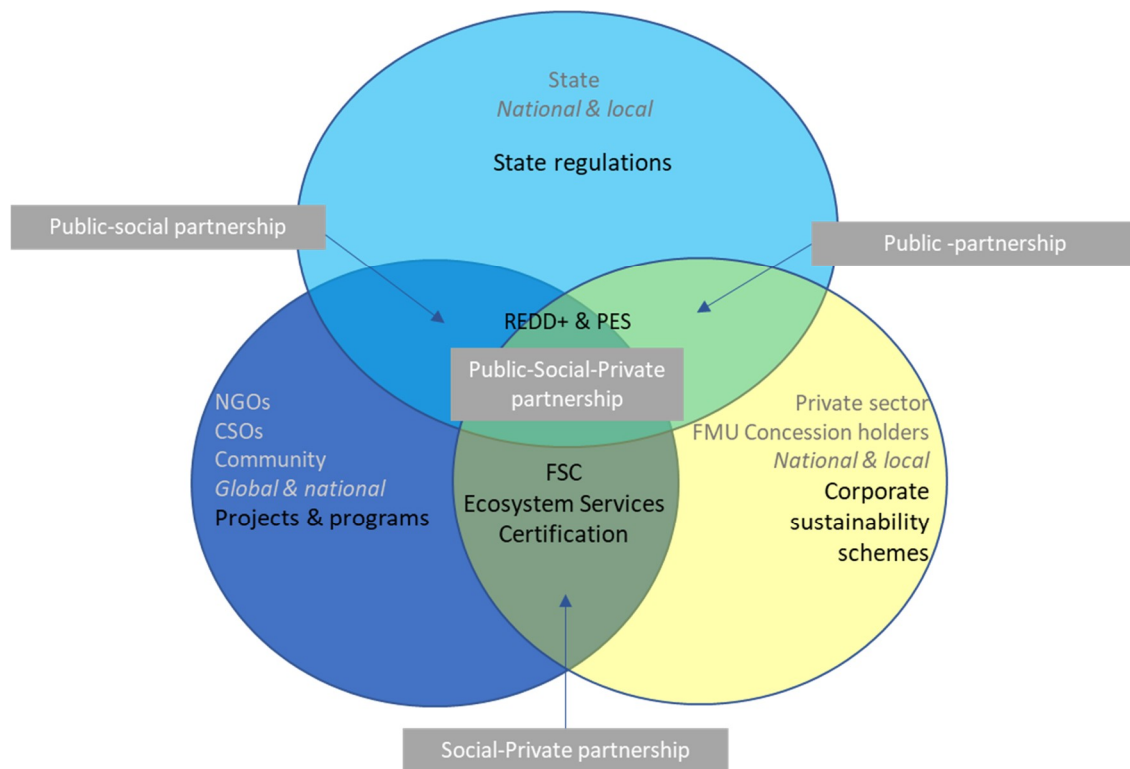
This experience mirrors Milder and colleagues [43] findings relating to SAN/Rainforest Alliance certification, that policies are sometimes in synergy and sometimes at cross-purposes. Complementarity can create enabling conditions for private governance such when laws and regulations are set up on land rights and deregulating bottlenecks in value chain certification. However multiple laws and regulations in conjunction with sustainability tools and private initiatives can create difficulties in determining which were effective and contributed to meet sustainability goals. Pacheco et al.’s [44] investigation of the state and private certification regimes governing palm oil supply in Indonesia shows a similar situation where complementarities emerged among instruments with global reach, but

disconnects occurred within state regulations, between regulations and private standards, and between standards operating across different territorial scales.

**Table 3.** Types of interactions in the agenda setting and negotiation phase between state regulations and non-state market driven ecosystem services governance in Indonesia.

Type of Interactions	Examples
<b>Complementary</b>	
<ul style="list-style-type: none"> <li>Private or hybrid instruments reinforce state regulations</li> </ul>	<ul style="list-style-type: none"> <li>FSC ES certification fits into the tools (labelling systems) included in Government Regulation No. 46/2017 on Economic Instrument on Environment.</li> </ul>
<ul style="list-style-type: none"> <li>Private or hybrid instruments fill policy gaps</li> </ul>	<ul style="list-style-type: none"> <li>FSC ES certification fills policy gaps on halting deforestation and promoting sustainability.</li> <li>Fills gaps on how to measure impacts of restoration and conservation projects</li> </ul>
<ul style="list-style-type: none"> <li>State threatens regulations for private sector to adopt voluntary standard</li> </ul>	<ul style="list-style-type: none"> <li>No examples found for FSC ES certification. State mandatory standards ISPO for palm oil and the Indonesian Timber Legality Verification System (<i>Sistem Verifikasi Legalitas Kayu</i>, SVLK) for timber</li> </ul>
<ul style="list-style-type: none"> <li>State promotes information sharing and greater transparency</li> </ul>	<ul style="list-style-type: none"> <li>FSC ES certification reinforces government SVLK.</li> </ul>
<ul style="list-style-type: none"> <li>State participates in multi-stakeholder roundtables</li> </ul>	<ul style="list-style-type: none"> <li>No examples found for FSC ES certification</li> </ul>
<ul style="list-style-type: none"> <li>State collaborates with NGOs and local communities for natural resource co-management</li> </ul>	<ul style="list-style-type: none"> <li>State worked collaboratively with CSOs and community stakeholders on ecotourism in a FSC ES certification project</li> </ul>
<ul style="list-style-type: none"> <li>State encourages private sector standards to converge</li> </ul>	<ul style="list-style-type: none"> <li>No examples of state encouragement in FSC ES certification.</li> <li>State encouraged REDD+ projects with a national REDD+ strategy and ministerial regulation.</li> </ul>
<b>Substituting</b>	
<ul style="list-style-type: none"> <li>State endorses certification in public policies</li> </ul>	<ul style="list-style-type: none"> <li>No state endorsement of FSC ES certification</li> </ul>
<ul style="list-style-type: none"> <li>State adopts certification standards in laws</li> </ul>	<ul style="list-style-type: none"> <li>No aspects of FSC ES certification adopted in laws.</li> <li>RSPO oil palm certification standards mirrored in ISPO, and aspects of timber legality Voluntary Partnership Agreement (VPA) adopted in SVLK timber legality system</li> </ul>
<b>Antagonism</b>	
<ul style="list-style-type: none"> <li>Different instruments propose conflicting management practices and/or different incentives</li> </ul>	<ul style="list-style-type: none"> <li>Various instruments and initiatives define ES inconsistently</li> </ul>
<ul style="list-style-type: none"> <li>Standard owner's dissociation of non-compliant companies.</li> </ul>	<ul style="list-style-type: none"> <li>Disassociation of companies from FSC and RSPO certification and ISPO revocations. Created consumer confusion.</li> </ul>
<ul style="list-style-type: none"> <li>Existence of norms undermines efforts to develop stronger regulations</li> </ul>	<ul style="list-style-type: none"> <li>Unclear land tenure makes compliance with FSC ES certification challenging</li> </ul>
<b>Absence</b>	
<ul style="list-style-type: none"> <li>Private instruments developed without state involvement</li> </ul>	<ul style="list-style-type: none"> <li>Limited state involvement in one ForCES FSC ES certification project</li> </ul>
<ul style="list-style-type: none"> <li>State develops certification instruments without private sector involvement</li> </ul>	<ul style="list-style-type: none"> <li>No example for FSC ES certification</li> </ul>

In FSC ES certification in Indonesia a multi-stakeholder social-private partnership between civil society, private sector and non-governmental entities, shown in Figure 4, collaborated to create new type of governance for ecosystem services. This is form of NSMD governance where civil society and industry collaborate, also termed corporate governance [45]. The collaboration has not yet led to a public-social-private governance arrangement foreseen by Delmas and Young [27]. This difference may be due to the niche innovation status of FSC ES certification, given that market demand for ES products and certification is not yet well-established and the ForCES project acted as an incubator for creating and testing new sustainability tools [26].



**Figure 4.** Forest Ecosystem Services Certification governance as a social-private partnership in Indonesia (inspired by Delmas and Young [27]).

As FSC ES certification is in the process of being scaled up in the socio-technical innovation journey, further complementarity with state regulations could be gained. ES certification has already resulted in changes in FSC certification by giving the tools for forest managers to explicitly demonstrate the impacts on ES. To upscale further civil society, NGO and private sector partners behind FSC ES certification may need to engage with other certification schemes to enact a regime change. FSC ES certification could potentially fill gaps in commodity value chain certification schemes such as RSPO and ISPO, which while making some ES explicit, have a commodity focus rather than on an ecosystem or landscape level. The holistic approach taken by ES certification and the tools and guidance developed, such as the High Conservation Value (HCV) concept already used in forest management certification, is complementary other initiatives. These include the Accountability Framework Initiative, the Policy Transparency Toolkit (SPOTT), Global Canopy's Forest 500 initiative, the TRASE platform and Global Forest Watch which support monitoring and reporting. It is easier to generate complementarity between market and state governance when such initiatives are in a pilot phase or when they have local focus or focus specific commodities rather than an ecosystem. Increased complementarity can enable a broader focus on ecosystem services, increase uptake and drive innovation to a regime level.

Equally, FSC ES certification could engage with other ecosystem services initiatives such as REDD+ and PES projects, to increase additionality. Given that the REDD+ and PES projects in Indonesia are



more embedded in state regulations, they offer a window of opportunity for FSC ES certification. FSC ES certification in turn can offer a developed set of tested tools that both private and state sector can use to measure and verify ecosystem services and impacts. ES marketplace websites such as the Ecosystem Marketplace and Watershed Projects provide information about the PES projects that is can help further develop ES tools, overcome challenges and improve positive impacts. REDD+ projects have been shown to be more effective when tenure rights are clear [46], but as many REDD+ and PES projects struggle to be effective due to tenure issues [47,48]. Tenure was problematic in some sites of the ForCES project [6], indicating that its highly likely that uncertain and contested tenure will hinder FSC ES certification. State lands and natural resources which are used and claimed by communities, invite different interpretations of who has actual rights and responsibilities over them. Government licenses to use or convert forests on community-claimed lands in Indonesia has led to conflict [49]. This in turn can reduce incentives to protect forest ecosystems.

The growing number of corporate voluntary zero deforestation commitments and multi-stakeholder initiatives can be also seen as an additional, complementary exogenous factor that may aid adoption of FSC ES certification at a regime level, akin to the way that the High Conservation Value (HCV) toolkit has been adopted in RSPO and FSC certification [50].

### 5.1.2. Antagonistic Interrelations

Secondly, some antagonistic interrelations were found among state regulations concerning ecosystem services, or between state regulations and FSC ES certification.

Several of the regulations provide conflicting definitions of ES, their scope in terms of land-use, and how ES are measured and governed. Using the lens of transition theory, FSC certification can be seen as an innovation regime, given its development and mainstreaming into market-based governance in the last two decades [40]. The characteristics of an innovation regime, as defined by Grin et al. [23], include clear cognition (indicated by the set of belief systems embodied in the standard and processes, guidance documents with goals and agenda) and norms (embodied in the FSC principles and criteria setting out role relationships, values and behavioural norms). According to this definition, the state regulatory regime has not yet reached an innovation status, as it includes outdated concepts which conflict with recent regulations which have a more explicit focus on ecosystem services e.g., carbon and watershed protection.

Antagonism between state regulations and FSC ES certification occurs mainly due to unclear land and resource tenure norms which undermines efforts to develop stronger regulations and make compliance with FSC ES certification challenging. Such antagonism between state and private schemes also occurred in the sphere of timber legality certification in Indonesia, where proponents of the four main schemes (FSC, PEFC, LEI, and SVLK) delegitimized each other's schemes, suggesting that legitimacy is a tool in market competition to win market acceptance and share [51]. Although the FSC scheme was considered the best scheme according to the Forest Certification Assessment Guide (FCAG), small-scale forest holders prefer the SVLK scheme, which had the lowest FCAG score, because of its mandatory nature and available subsidies.

Antagonism could also be reduced by better linking existing state regulations to private standards at multiple levels and embracing sectoral and multi-stakeholder approaches of commodity value chain certification and corporate sustainability initiatives, with more integrated territorial, landscape level management and governance. Accommodating and coordinating multilevel governance in landscapes (such as those in the ForCES project) beset with institutional fragmentation and jurisdictional mismatches is challenging. It requires alignment with local initiatives and governance structures, and frameworks to assess and monitor the performance of multi-stakeholder approaches implies moving beyond existing administrative, jurisdictional and sectorial silos, where multi-stakeholder platforms and bridging organizations and individuals are seen as key [52].

### 5.1.3. Substitution Interrelations

Thirdly, no substitution was found between state regulations concerning ecosystem services and FSC ES certification. The state did not endorse or adopt FSC ES certification. This may be because the concept is too recent. Examples from timber and oil palm certification schemes, which explicitly mention ecosystems services [14,53] and have been operating for longer show how the state has adopted many of the concepts used in the timber VPA and oil palm certification. These commodity certification schemes also followed some similar development trajectories: starting as private, civil society and NGO governance arrangements with later state adoption of these concepts in mandatory standards. For example, in 2011, Indonesia's Ministry of Agriculture decreed the mandatory ISPO standard, which has similarities to the voluntary, certification systems of RSPO, International Standard for Carbon Certification (ISCC) and Sustainable Agriculture Network (SAN). These four standards cover a similar range of topics, but the depth, breadth, and level of detail in addressing key issues varies, reflecting goals of the different initiatives behind each standard but also indicative of a process of converging, emerging norms for sustainable good practices in oil palm [53].

### 5.1.4. Absence of Interrelations

A fourth category, where a lack of state and non-state interactions was found, was also evident. FSC ES certification was promulgated as NSMD governance, with the ForCES project used to develop the ES standard by civil society, non-governmental and research organizations as key stakeholders in the agenda-setting and negotiation phase. Although the Indonesian government was in the overall project steering committee, only one other example of engagement with the government was found, where private-social agents collaborated at niche and regime level to formulate a supporting environment for ForCES and FSC to work the field. Paraphrasing Mokyr's [54] analogy, they prepared the environment for seeds to grow because eventually "the environment into which these seeds are sown is, of course, the main determinant of whether they sprout" or die. Agents in the state and non-state systems did not interact to endorse or implement the voluntary standard into a state regulation. This contrasts with the legally binding VPA on timber legality developed between EU and Indonesian public, private and civil society actors to promote trade in legal timber products and improve forest governance. This agreement led to the mandatory SVLK [55].

## 5.2. Opportunities to Create Synergies by Closing the Gap between Conceptualizations of ES in State Regulations and Voluntary Sustainability Certification

Different complementarities, antagonisms and absences of collaboration characterize the current governance arrangements of ecosystem services by the state, private sector and civil society. Building connections and enhancing complementarities could be important ways to gradually reduce antagonisms and fill the voids.

The results of the analysis of Indonesian regulations show that various terms for the concept of ES are used and lack consistency. Different regulations use different terms, some without clear definitions, creating the possibility for different interpretations. State regulations concerning ES are biased against improved forest management due to problems in practice to access credit and high transaction costs to obtain and process permits, the lack of tenure security and unclear tenure and resource rights and weak institutional capacity to enforce forestry regulations and avoid forest encroachment. These results confirm Lambin et al.'s [10] findings on the limitations of command and control instruments. They found uncompensated opportunity costs, a lack of government enforcement, decreased governmental power in response to transnational markets and unanticipated spill-over effects outside the regulator's jurisdiction.

As the majority of forestry and conservation laws were enacted over twenty years ago, they largely predate the international use of the concept of ecosystem services in this policy arena. However, Government Regulation No. 46/2017 on Environmental Economic Instruments provides definitions of types of ES and market driven initiatives which seek to enhance, protect nature and to mitigate

impacts on ecosystems. However, this regulation adds to the complexity of existing regulations on natural resources. An abundance of state regulations does not imply their efficacy, particularly when land tenure continues to be disputed [56]. In contrast, ecosystem services are clearly defined in the FSC ES certification procedure, providing a bridge between some state regulations and FSC ES certification, and a complementary bridge to other voluntary commodity certification standards, corporate deforestation commitments, REDD+ and PES.

Given that this study is based on a single, recent case (the ForCES project and resulting ES procedure) of market-driven governance, a limited number of informants and scrutinized only state regulations and policies that directly affect land use (protected areas and other land use restrictions) relating to forestry and agriculture, the generalizability of lessons to other forms of voluntary, market-driven initiatives is limited. Mather [57] notes that state governance of land use has traditionally relied on mixes of command-and-control instruments covering both direct land use policies (such as protected areas and other land use restrictions) with land-based activity policies (such as agricultural and forestry policies) and indirect land use policies (macro-economic, trade, fiscal and property law). As this study scrutinized only state regulations and policies directly affecting land use and agricultural and forestry policies, a wider review of policies is recommended in future studies.

The existence of multiple laws and regulations in parallel with market-driven certification also creates difficulties in unentangling and determining the impacts of the different state and NSMD governance arrangements and determining the effectiveness of each in reaching sustainability goals at different scales [43,58], enabling policies and private initiatives to be implemented more cost-effectively.

## 6. Conclusions

This study aimed to understand the interrelationships between ecosystem services certification as a voluntary sustainability standard and state regulations concerning ecosystem services in Indonesia. The study is framed using conceptual frameworks of transition theory and governance, focusing on statutory and non-state market-based governance arrangements and their interrelationships in the agenda setting and negotiation stages of the development of the FSC ES certification in three pilot sites in Indonesia.

Public regulations in Indonesia are shifting towards more explicit attention to and governance of ecosystem services. Forests are defined as an ecosystem unit in the form of landscape containing biological resources dominated by trees. Therefore, ecosystem services are embedded in regulations covering forest ecosystems and their products—mainly timber and non-timber, but also services. Recent regulations have defined the benefits of ecosystems for people and life including the provision of natural resources, natural and environmental arrangements, natural processes and for their cultural values. By explicitly using the terms environmental and ecosystem services, environmental challenges are framed in neoclassical economic utilitarian terms [13]. The many interpretations of ecosystem services in Indonesian regulations and policies, however, appear to trigger confusions, i.e., how forest owners and managers should comply with the different regulations. Statutory regulations are mandatory, based on a carrot and stick policy design, creating obligatory requirements for companies and individuals, whilst there are few regulatory or fiscal incentives for compliance with voluntary standards, stakeholders, particularly NGOs and CSOs, and competitive and supply chain-based pressure appears to provide an alternative incentive.

The FSC ES certification standard and procedures provide one clear definition of ES compared to the multitude of definitions of ES in state regulations. ES certification is an option under FSC Forest Management Certification, aiming to demonstrate the impact of restoration and conservation initiatives by forest managers in return for monetary incentives.

At all levels of the governance process—agenda setting and negotiation, implementation and monitoring and enforcement, complementary, substituting and antagonistic interrelationships occurred between voluntary sustainability standards as non-state market driven governance arrangements, and state governance arrangements. An absence of any interrelations was also found. Although the

ES certification standard is voluntary, and the Indonesian government was hardly involved in its development, it is generally complementary to state regulations: filling gaps and providing tools to measure benefits and impacts of restoration and conservation activities. As most of connections were complementary, and as FSC certification and FSC ES certification has a strong focus on stakeholder engagement, traction can be gained using a stakeholder approach that includes public, social and private sector stakeholders to reduce antagonistic relationships, which is known to suppress innovation. Antagonism occurs also in the state regulations where various regulations are existing with varying ES terms in the regulations leading to public confusion.

While ES certification is novel to Indonesia and globally, the FSC ES system appears to have synergies with other market driven ES initiatives by allowing the certification of ES and bringing them to an ES market. FSC ES certification provides tools to measure and quantify ES.

Two major aspects need to be addressed if the concept of ES certification is to move from a niche to regime innovation. The first are the interlinked issues of transparency, legitimacy and accountability that have dogged voluntary NSMD standards [59,60]. Concerns about the lack thereof have led to the counter-development of southern standards [61], such as the Indonesian Sustainable Palm Oil and the Indonesian Timber Legality Verification System. Also, there have been cases where after pressure and campaigns, certification standards such as FSC have disassociated themselves from companies not complying with their standards. Experiences with NSMD commodity certification suggest whilst voluntary sustainability standards were introduced as innovations with high expectations of solving multiple sustainability issues including safeguarding ecosystems, they generally have not been a panacea with expected outcomes and impacts [41,58]. Without support from enabling regulations it is questionable if FSC ES certification can achieve its intended impact [58] or gain a sufficient “logic of appropriateness” as it progresses through the phases of innovation, to garner sufficient legitimacy [1]. A second barrier are the underlying issues of land and natural resources tenure rights and responsibilities. Without clarification, the potential access, benefits and costs that could accrue from ES certification rest on rocky ground, as has been shown in NSMD approaches such as PES and REDD+ initiatives [46,62].

In summary, three types of interactions between FSC ES certification and regulatory governance arrangements were found. Most of the interrelationships are largely complementary with Indonesian state regulations with non-state arrangements filling policy and regulatory gaps, such as providing tools to verify the impacts of certification as a tool to protect ecosystem services. Voluntary, non-state market driven governance such as certification, some PES based REDD+ schemes and corporate zero deforestation commitments focus on private sector activities—both on producers such as timber concessions but also on companies as buyers and consumers. The development of FSC ES certification in Indonesia has also involved stakeholders such as small-scale farmers, communities, NGOs and civil society organizations, but the state was only involved when protected areas were included in a landscape level initiative. State regulations governing ES are abundant and operate on different scales, with antagonism among state regulations when instruments conflict each other at any different stage of the regulatory process and do not address unclear land tenure, undermining certification. To further the acceptance and adoption of ecosystem services certification and demonstrate its effectiveness as a non-state market-driven policy instrument for land use governance and conservation, both FSC as a standard organization and its civil society and non-governmental organization, and private sector partners arguably need to engage more with national and local policies and regulatory processes to ensure synergistic interactions. This could enable the voluntary non-state market driven governance mechanism to progress from a niche level innovation to a regime changing standard

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