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Challenges for developing Forest Stewardship Council certification for ecosystem services: How to enhance local adoption?

Sini Savilaakso [a,*], Manuel R. Guariguata [b]

[a] Center for International Forestry Research, PO Box 0113 BOCBD, Bogor 16000, Indonesia
[b] Center for International Forestry Research, Av. La Molina 1895, Lima, Peru

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ABSTRACT

The rise of ecosystem services (ES) as a conservation and management tool has changed the way forests are conceived, but so far its translation into management actions has been limited. In this paper, we discuss the development of certification of forest ecosystem services (FES) from the perspective of those implementing it at the local level. We focus on the lessons that emerged from applying the Forest Stewardship Council (FSC) certification framework at selected sites in Chile, Indonesia, Nepal and Vietnam.

Our results indicate a clear relationship between local and global levels in the development of FSC FES certification. Although the FSC already had a broad vision of ES, it was only through local-level learning within a specific pilot experiment that the vision evolved and resulted in more formal FES certification becoming part of FSC forest management certification. We also found that those sites where participatory approaches to management and decision-making were applied could work with an undefined vision of the future system, and still successfully design and implement management activities. However, overall the lack of specific vision and detailed information about future FES certification was problematic in attracting market interest in FSC certified ES.

1. Introduction

The benefits that nature provides have long been recognized. Plato had already observed the effects of deforestation on soil erosion and drying of springs in 400 BC (Daily, 1997). Until the late 18th century and the beginning of classical economics, land was seen as a main source of wealth (Gómez-Baggethun et al., 2010). Furthermore, the importance of labor as a source of wealth was emphasized. It was only during the neoclassical period of the past century that economics was decoupled from the physical world. And it wasn't until the late 1970s that nature's value became prominent again leading to the concept of ecosystem services (ES). More than one decade ago the (Millennium Ecosystem Assessment, 2003) drew international attention on the importance of ecosystem processes for human well-being.

Despite the elevation of the ES concept into the public and private sectors, it is yet to transform natural resource use worldwide. In particular, there is a need for improved management and governance of forest resources that acknowledges the value of ES and the necessary actions to minimize their degradation (e.g. Thompson et al., 2013). This will need a system that incorporates environmental values (both tangible and intangible) into markets, institutions, and policy actions (Barbier, 2011). Such transitions are usually rare because of intransigence of social institutions: existing structures are created to preserve the *status quo* and power imbalances are hard to eradicate (Barbier, 2011; Westley et al., 2011). Even when transitions occur, they are still shaped by existing elements and interactions between them (Westley et al., 2013).

One key component of a transition is to change governance systems either by creating new policy instruments or by incorporating innovative ideas. Policy instruments in the context of forest governance stem from the public and private sectors. Those of public origin include command-and-control (e.g. government-sanctioned protected forests and forest concessions, agricultural and forestry policies) as well as those that affect forests indirectly (e.g. international trade and foreign investment policies; (Mather, 2006, as cited in Lambin et al., 2014). In addition, there are market-based, voluntary instruments by non-state actors such as certification

Abbreviations: ES, ecosystem services; FES, forest ecosystem services; ForCES, pilot project: Expanding FSC certification through incorporating additional ecosystem services; FPIC, free, prior and informed consent; FSC, Forest Stewardship Council; NGO, nongovernmental organization; NTFP, non-timber forest products; PES, payment for ecosystem services.

* Corresponding author.
E-mail addresses: sini.savilaakso@gmail.com (S. Savilaakso), m.guariguata@cgiar.org (M.R. Guariguata).

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schemes and commodity roundtables (Auld et al., 2008; Lambin et al., 2014). The evolution of international forest governance from its early focus on sustainability, then to legality, and finally to units of sequestered carbon has also given rise to new instruments such as payments for environmental services (PES) and REDD+[1] mechanism (McDermott, 2014; Wunder et al., 2008). The core of both PES and REDD+ is that avoided forest degradation and deforestation is compensated to those that maintain a set of forest values including the many ES it provides (UN-REDD 2015; Wunder et al., 2008). Although recognition of ES as positive externalities that should be paid for have the potential to improve forest management and conservation, commoditization of ES has risks because of their intrinsic complexity (Muradian and Rival, 2012). These risks include trade-offs and overlaps with other land use decisions and other ES when the management focus is on a single service. In addition, low levels of additionality as well as oversimplification and untested assumptions of the functional linkages between ES and management actions may occur (e.g. Prager et al., 2016).

One potential policy innovation to improve natural resource management, among other arrangements (e.g. "network governance" Provan and Kenis, 2008; Scarlett and McKinney, 2016) is the emerging field of certification of ES (Berg et al., 2013; Polasky et al., 2015). Specifically, here we define certification of forest ecosystem services (FES) as a market-based mechanism that includes activities meant to guarantee that a given forest stand is explicitly managed in a way that maintains or enhances the provision of a specified ES. This may come in some form of direct quantification of the service provided and its quality. The current ES certification standards concentrate on either specific services or bundles of services. For example, the Verified Carbon Standard (VCS, 2014) focuses on carbon sequestration projects; the Climate, Community and Biodiversity Standards (CCBA, 2014) focus on land management projects that deliver net positive benefits for climate change mitigation, local livelihoods and biodiversity.

To move beyond timber, the Forest Stewardship Council (FSC) is currently expanding to include FES in an explicit fashion (ForCES, 2011). This was put to the test through a multi-country pilot project entitled "Expanding FSC certification through incorporating additional ecosystem services" (hereafter ForCES). To date, the provision of FES has been implicit within FSC certification schemes for timber (Romero et al., 2013). However, the provision of FES is most often not directly evaluated during third-party auditing. The FSC pilot approach to FES certification is built around providing new tools for certificate holders to access ES markets or non-monetary benefits, and includes several key features: it targets several ES at once; the potentially certifiable ES are agreed through consultation with local stakeholders; and it includes impact evaluation assessments to ensure that promotional claims are evidence-based (FSC, 2015a). To our knowledge, there is not yet a third-party, voluntary certification scheme that verifies the impact of forest management on the provision of ES and the associated benefits these provide to people.

There are several areas of opportunity for FES certification to become a reality. First, is the recognized value of ES to human well being (Millennium Ecosystem Assessment, 2005; Stern, 2007) which has manifested in the rise of payment for ecosystem services (PES) schemes and national ES accounting schemes, and in corporate interest in natural capital and ES (Boyd and Banzhaf, 2007; Costanza et al., 2006; de Groot, 2011; Stanton et al., 2010; van der Meer et al., 2007; Waage and Kester, 2013). Second, the general lack of safeguards associated with REDD+ projects to protect local communities from potential negative impacts, such as loss of biodiversity, weakened property rights, and unequal distribution of project benefits (Jagger et al., 2012). FSC certification already includes environmental and social standards used globally, with guidance on processes such as free, prior and informed consent (FPIC), which are at the center of REDD+. A third opportunity is that political commitment is moving from "business as usual" to the use of natural resources for the maintenance of ES provision. This is exemplified by the establishment of the Intergovernmental Platform on Biodiversity and Ecosystem Services created to strengthen the science-policy interface for biodiversity and ecosystem service conservation and human well-being (IPBES, 2012). Finally, there is the growing need to manage asymmetric information flows between sellers and buyers in the ES markets to keep the markets both efficient and effective (Ferraro, 2008). Certification of FES could provide the buyer with information about the quality and quantity of the service being delivered, and thus increase both transparency and information flow between parties.

Yet challenges for certification of FES do exist. These include: (1) not large enough markets and reduced consumer demand for bundled FES; (2) complexity associated with the delivery of FES and forest management actions; and (3) potentially high costs of getting certified (Meijaard et al., 2011). To transform a forest governance model focused on timber production towards one both including and directly valuing ES, FES certification needs to not only tackle these challenges but become adopted into public legislation, either as a complementary instrument or through incorporation of the concepts ingrained in the FES certification. For example, verification of certification impacts and FPIC. Here we seek to introduce an operational framework on how such a transition could occur and use it to analyze empirically the development of FES certification through the multicountry ForCES pilot project (see Section 2 below). In the next section we introduce key concepts (niche development and sustainability transitions) in the multi-level perspective framework, before outlining the research questions and research methods. We then examine how different factors have contributed to the development of FES certification through the ForCES project, from an initial vision and to the development of specific certification tools. The paper follows with a discussion on how to enhance local-level adoption of FES certification schemes and after that presents some conclusions.

1.1. Multi-level perspective: An operational framework for understanding niche development and sustainability transitions

The multi-level perspective (MLP) framework, although it originates from the technological transitions literature (Rip and Kemp, 1998), provides a useful approach for understanding sustainability transitions in other contexts. The MLP distinguishes three levels: niches (micro level), regimes (meso level), and exogenous landscape (macro level) (Fig. 1) (Geels and Schot, 2007). Adapting the framework to forest governance, we see that a transition, for example, from timber production towards a new management paradigm can occur through interacting processes within and between the above mentioned levels. In a technological context, niches are where innovations are developed (Schot et al., 1994) but in our adapted model, the niches are used to create and test policy innovations. Earlier research has found that the importance of niches is especially relevant in a sustainability context where markets and user demand may not readily exist (Schot et al., 1994). In the following paragraphs we describe the MLP framework in detail as it relates to our work.

According to the MLP framework, innovation development occurs at two levels simultaneously: local and global (Geels and Raven, 2006). Local projects are often used to test the vision in real-life situations and further develop the innovation as is the case

[1] REDD+ stands for "reducing emissions from deforestation and forest degradation, and enhancing forest carbon stocks in developing countries". REDD+ includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks through emission reductions (UN-REDD, 2015).

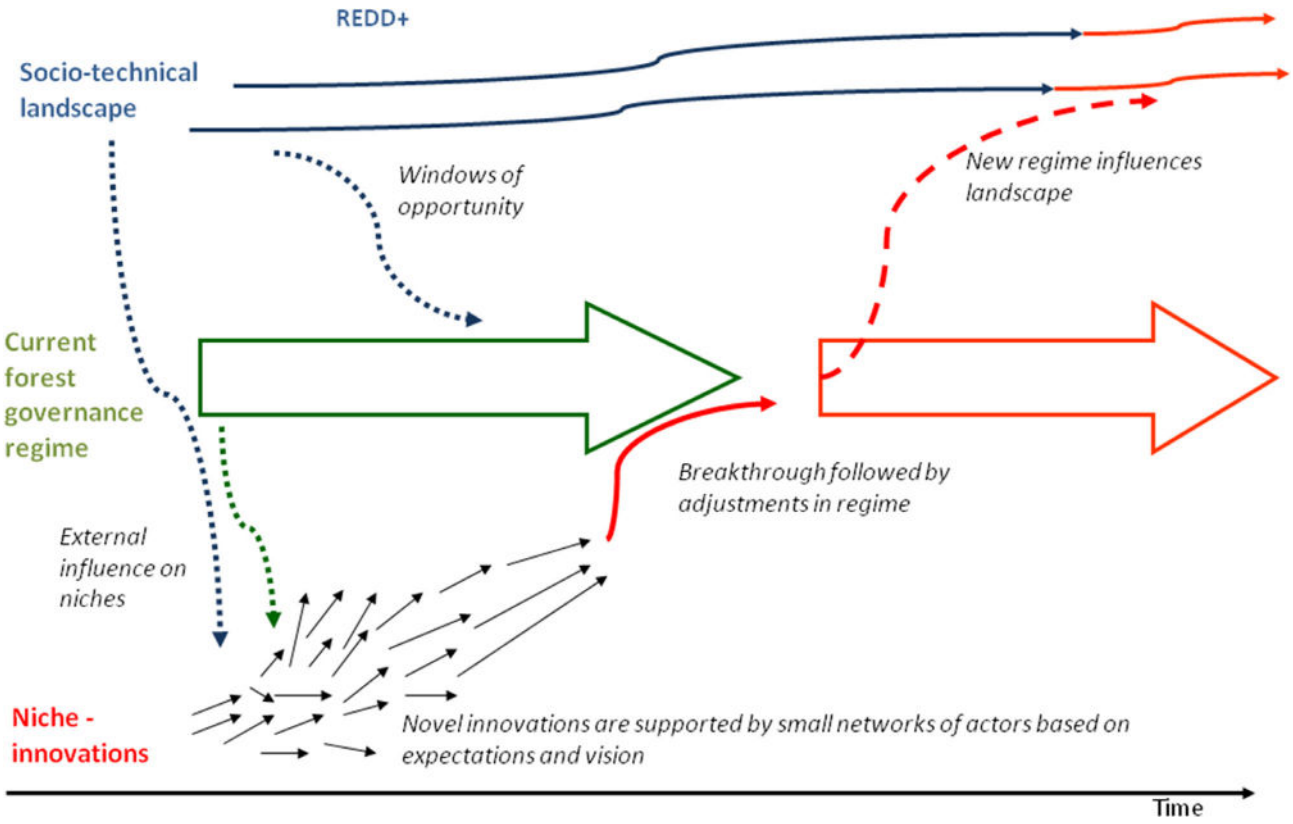

Fig. 1. The operational framework for how policy innovations can generate transitions towards more sustainable governance of natural resources. Adapted from Geels and Schot (2007). *Note*: The socio-technical landscape includes macro-political developments such as REDD+ that provide possible opportunities for policy innovations to break into the current forest governance regime, whereas niches are where the policy innovations are developed and tested. Changes in the current governance regime occur through interacting processes within and between these levels. The first big arrow in the figure depicts the governance regime before the policy innovation breakthrough, whereas the second big arrow depicts the governance regime after the innovation has led to adjustments in it.

in development of FES certification within the ForCES project. Experiences from the local level are aggregated at the global level and lead to clearer expectations and visions that steer innovations. It is important to note that in research on sustainability transitions, the terms "local" and "global" are not tied to the conventional meaning but rather depend on the scale of the study (i.e. whether sustainability transition is studied within a nation state, part of it, a certain region or globally). In our study, the local level comprises activities undertaken within the ForCES project as explained later, including national standard development, and hence the line between national and local actors is not clear cut.

In our adaptation of the MLP framework the forest governance regime comprises national public policies together with voluntary instruments. The regime is embedded in the socio-technical landscape that includes societal values, political ideologies, macro-political developments and macro-economics (Geels and Schot, 2007). Landscape-level developments put pressure on the regime and create opportunities for change; in the field of forest governance an example is the pressure to combat deforestation and forest degradation that led to the creation of certification schemes, which have become part of the forest governance regime in many countries.

Following the original MLP framework, novel innovations are supported by small networks of actors based on their expectations and visions. These actors often include policy-makers, but do not necessarily exclude others (Schot and Geels, 2008). Drawing from the transition literature we determine that actors of the social networks have several roles in niche development (e.g. Moore et al., 2014; Schot and Geels, 2008; Westley et al., 2013) They are the visionaries and momentum builders behind the innovation (first-order social network) that provide an initial vision and try to build support for it in order to gain funds and other resources to enable testing it at pilot sites. If they succeed, second-order networks are built to gain further support. Social learning is important. Actors implementing the pilot activities give feedback on the original innovation, which in turn can be improved to correspond with real-life situations. Actors in the social networks also build bridges that help with the adoption of a given innovation. Before a new policy innovation breaks through into the existing forest governance regime, it builds linkages within the niche level as well as between the niche and regime levels, a process called anchoring (Elzen et al., 2012). Following the conceptualizing of Elzen et al. (2012) the new connections are vulnerable at the beginning but can over time develop into durable links that enable transition. Anchoring can take place within the network of actors who are developing or using the innovation (i.e. the social network) either by strengthening the connections between the actors or extending the network. Anchoring also occurs when the details of the innovation become more specific in response to the further refinement of the original idea and to the needs of those that will use the innovation. Finally, anchoring can happen between regime and niche levels when developments within a niche are translated into new or adapted (interpretative, normative or economic) rules that have influence, at least temporarily, on the activities of both niche and regime actors.

The extent of a transition is dependent on the timing and nature of the multi-level interactions. The optimum timing occurs when there is awareness about the problem, at least one potential solution to the problem, and a favorable policy-making environment. So that policy-makers have the motive and opportunity to enact

policies that cause sustainability transition (Kingdon, 1984; Zahariadis, 2007). The three main interactions that can occur at different stages of the regulatory process (agenda setting and negotiation, implementation, and monitoring and enforcement) are complimentarity, substitution and antagonism (Lambin et al., 2014). Complementarity means that two governance systems mutually reinforce each other. For example, compliance with FSC certification may guarantee a certain level of resource provision for ES buyers in PES schemes, or generate rewards for those who comply with extra-legal standards; while a public regulation sanctions those who violate the law. Substitution occurs when a government entity replaces a private-led mechanism through policy learning or norm generation. The initial mechanism may maintain an informal role after a formal regulation takes over its function. Hence, substitution and complementarity may overlap. Finally, when two governance systems are antagonistic they can undermine each other at all stages of the policy and implementation processes.

Although sustainability transition can result from one innovation, in forest governance it rarely would. This is because forest governance is usually fragmented across jurisdictions and includes multiple actors. Forest governance is practiced not only within the boundaries of nation states but also in the realm of international politics, which subsequently may affect national arrangements (Arts and Buizer, 2009; Giessen, 2013; Primmer et al., 2015). It is executed by state, markets or civil society either alone or more often through hybrid modes of governance, which include public–private partnerships (e.g. logging concessions and co-management of resources) and social–private partnerships such as PES (Lambin et al., 2014; Lemos and Agrawal, 2006). Yet PES as a term has been used to describe various governance instruments also outside of this category (Pirard, 2012). As forest governance related to FES is emerging at multiple levels (Berg et al., 2013; Hamrick, 2016; Mann and Simons, 2015; Polasky et al., 2015), lessons learned on developing FES certification may give guidance to other similar initiatives.

1.2. Research questions

In this empirical study we examine the key factors that play a role in the early phases of sustainability transition. That is, when a new policy innovation is developed and tested at the niche-level with the purpose of transforming it into a market-based policy tool to influence the current forest governance regime (internal factors hereafter). The focus is on the FSC-led, FES certification approach based on the multicountry, ForCES pilot project as described below. Our research questions are the following: (1) How has FSC's vision for FES certification evolved during and before the ForCES project? (2) What has been the role of vision in steering the FES certification development process in the ForCES project? (3) What kind of social networks have existed at the pilot sites to support the development of FES certification? and (4) What has been learned in the FES certification development process through the ForCES project? By answering these questions, we aim at identifying ways to eventually enhance the local-level adoption of FES certification schemes in the future.

2. Methods

2.1. Study area

The study comprises 10 sites across four countries (Chile, Indonesia, Nepal and Vietnam) that implemented pilot FES certification schemes in the context of the ForCES project (October 2011 through March 2017). The sites targeted several FES (biodiversity conservation, hydrological services, tourism and scenic beauty, carbon sequestration and soil conservation) which are managed by different entities (Table 1). There were two different strategies to guarantee or else enhance the provision of FES across sites: (1) Preserving the existing forest and improving their management and (2) reforesting while protecting existing forest. The first was used in sites prioritizing biodiversity conservation, carbon sequestration, tourism, and scenic beauty (Carahue-Imperial, Pumalin, Kapuas Hulu, Ratah, Charnawati, Gaurishanker and Huong Son) whereas the second was used in sites targeting hydrological services or soil conservation (Mechaico, Lombok and Quang Tri). Overall, the national-level context differs between different countries (Table 2). It should be pointed out that only in Lombok there were two existing PES-like schemes in place at the time the ForCES project started (De Buren, 2013). The first one commenced in 2009 after a district-level regulation was passed on "environmental services management" in which consumers pay a monthly compulsory amount as part of their water bill, while water producers pay a volume-based tax. The funds are governed by a multi-stakeholder agency and are used to cover expenses for tree planting and local empowerment activities proposed by farmer groups in upstream areas. The second is run by the local water company. Since 2011 the water company has made bilateral agreements with farmers and the tree planting activities run in parallel with the first scheme.

2.2. Data collection and analysis

To answer the above research questions, we conducted both a quality-based assessment of FSC documents and semi-structured interviews, complemented by information gathered from workshops in the study countries (six), site visits (five) and project annual meetings (five). To analyze the vision of the FSC, we examined global strategy documents since 2007, as well as documents related to ES. We searched for vision statements using "ecosystem services", "services", "goals", "expectations" and "vision" as key words. The searches were run using the key words separately. The statements containing one of the key words and those that were referred to as goals, expectations and visions were extracted and the evolution of the vision assessed against time. The year 2007 was chosen as a starting point, when the FSC published its Global Strategy (a new Global Strategy was launched in 2015; see next section), well before the ForCES project begun. The full list of the searched documents is provided in Annex A.

For the semi-structured interviews, current and past ForCES project managers in each of the study countries were targeted as the sole holders of the knowledge required to answer the research questions. In total there had been six country-level project managers for the duration of the ForCES project but we could not reach one of them (bringing the total number of interviews to five). The respondents were asked about (1) articulation of vision and expectations in regard to FES certification during the implementation of the ForCES project, (2) the participants in social networks and their contribution to the FES certification scheme process, (3) the challenges in project implementation and key lessons learned in developing a national FSC standard on certification of FES, finding buyers for the FES, and implementing field activities (for specific questions see Annex B). Interviews were conducted in English – face to face or by Skype – in June 2016 and recorded. They took between one and two hours to complete. The textual data was analyzed using a thematic analysis framework by means of descriptive coding in which a short phrase or a single word is assigned to summarize the content (Esterberg, 2002). As there were only five respondents manual coding was undertaken. We used pre-established categories based on the interview guide except for the question related to challenges in project implementation for which we used open

Table 1
Key characteristics of the ForCES project sites.

Site	Ecosystem service targeted	Type of forest	Governance model
Chile			
Carahue-Imperial	Biodiversity (medicinal plants)	Plantations with patches of natural forest within the plantation	Private ownership by timber companies
Mechaico	Hydrological services	Natural forest (tree planting undertaken in erosion-prone areas).	Plots owned by individual farmers mainly for livestock and small-scale farming
Pumalín	Biodiversity conservation, tourism and scenic beauty	Natural forest	Privately owned protected area
Indonesia			
Lombok	Hydrological services	Mixture of natural and secondary forest as well as areas planted with multi-purpose tree species	Managed by four community groups
Kapuas Hulu	Tourism and biodiversity conservation	Natural forest	Community
Ratah	Carbon sequestration and biodiversity conservation	Natural and secondary forest	Private ownership by a timber company
Nepal			
Charnawati	Carbon sequestration, biodiversity conservation and soil conservation	Both natural and plantation forest	Managed by community forest-user groups
Gaurishankar	Carbon sequestration, biodiversity conservation and soil conservation	Both natural and plantation forest within a conservation area of various landscapes	Forest areas managed by community forest-user groups
Vietnam			
Huong Son	Carbon sequestration and biodiversity conservation	Natural and secondary forest	Government owned land managed by state forest enterprise
Quang Tri	Soil conservation	Plantation with an area of natural forest nearby	Managed by an association of smallholders

Table 2
Information about governance, the state of forest resources, and PES projects in the study countries.

	Chile	Indonesia	Nepal	Vietnam
Governance				
Specific law on PES exists	No	Draft	No	Yes
Other specific PES regulations or policies	No	Yes	No, but possibly not needed to implement PES in community-managed forests	Yes
Forest ownership	25% public and 75% private	91% public ownership	100% public ownership	72% public ownership, 24% private ownership
Holder of management rights in the public forest	Public administration	43% public administration and 57% business entities	66% public administration and 33% communities	NA
National FSC standard as of 2011 when the ForCES project begun	Yes	No	No	No
State of forest resources (% of total forest area)				
Natural forest[a]	30.2	50.6	14.5	0.6
Other naturally regenerated forest[a]	52.6	44.0	84.4	74.6
Planted forests[a]	17.2	5.4	1.2	24.8
Rate of change in the area of primary forest (% 2005–2010)[b]	−0.22	−1.21	0	−0.22
Rate of change in the area of primary forest (% 2010–2015)[a]	3.80	-0.50	0	0
Rate of change in the area of planted forests (% 2005–2010)[b]	−0.82	4.68	0	2.93
Rate of change in the area of planted forests (% 2010–2015)[a]	0.60	−0.82	0	−0.90
Current PES projects				
REDD+ pilot country	No	Yes	Yes	Yes
Number of operational forest carbon projects[c]	4	8	1	1
Number of active watershed projects[d]	0	7	1	1
Number of biodiversity compensation projects[e]	1	0	1	0

ForCES = Pilot project: Expanding FSC certification through incorporating additional ecosystem services; FSC = Forest Stewardship Council; NA = not applicable; PES = payment for environmental services.
[a] FAO (2015).
[b] FAO (2010).
[c] Forest Carbon Portal (2017).
[d] Watershed Connect (2017).
[e] Madsen et al. (2011).

coding to allow different categories to form. We also interviewed local stakeholders from Vietnam and Chile who had actively participated in the project (29) and further attended two local meetings by project participants in Nepal from July to November 2016 to extract further information related to the study questions and to triangulate the information previously given by the project managers. There were approximately 20 community members present at each local meeting. The participants represented their work

related to the maintenance and enhancement of FES and discussed challenges and opportunities related to FES certification at practical level.

3. Results

3.1. Evolution of vision for FES certification and its role in steering the development of FES certification in the ForCES project

Based on the FSC documents that were analyzed, we observed three phases in the development of the vision for FES certification. In the initial phase, ES were recognized at the conceptual level, as exemplified by the statements in the 2007 FSC global strategy: "The full range of forest products and services are maintained as part of the overall landscape" (FSC, 2007, p. 2) and "Other public benefits of forests such as ecosystem services and carbon sequestration are recognized by the FSC system" (FSC, 2007, p. 9). Four years later, the ForCES project document articulated the organizational need for change: "Nevertheless FSC is often seen as being exclusively timber focused rather than addressing the wider ecosystem services" (ForCES, 2011, p. 3). The 2007 strategy also included the first explicit mention of an FES-focused business model: "Non-timber forest products and services account for at least 5% of the total FSC-certified forest products market" (FSC, 2007, p. 7). Furthermore, details on the ways to move forward with development of FES certification started to appear. For example, regarding modifications of the FSC system: "To pilot test expanded and enhanced global and national environmental standards applied to emerging markets for biodiversity conservation and eco-systems services as an initial step for upgrading of successful models of FSC certification. This will be achieved through establishing FSC certification as a market tool for a wide range of ecosystem services which are currently not adequately covered for sustainable forest management" (ForCES, 2011, pp. 88–89).

In the second, or main development phase, the vision became more concrete as evidenced by the development of the FSC ES certification strategy (FSC, 2015a). The vision was also articulated in the FSC 2015 global strategy: "A new forest paradigm realized: the true value of forests is recognized and fully incorporated into society worldwide" (FSC, 2015b, p. 4); and further defined as "FSC will act as a vehicle for engaging with forest owners, producers, retailers and others to connect to new markets and other incentives that more accurately reflect the true value of forest ecosystems" (FSC, 2015b, p. 22). Also, it was stated that "FSC offers new tools for certificate holders to access emerging ecosystem service markets, and forest owners report increased net revenue as a result" (FSC, 2015b, p. 22). The ES certification strategy (FSC, 2015a) published during late 2015, outlines strategies on how to increase access of FSC certificate holders to ES markets.

The vision for FES certification had, by the end of our empirical data gathering, entered its last phase, where it was found to be specific enough to steer the development of the new FES certification tools that were emerging as part of the ForCES project. The local-level experiences at the different study sites had influenced the vision by providing a set of issues that FES certification needs to take into account. Based on the interviews, common questions that were raised among the people directly involved in implementing the project were: Would FES certification be a separate scheme like non-timber forest product (NTFP) certification or an add-on to the current forest management certification? How can it be used to access markets? Should social impacts be evaluated as well? Would it be the same scheme for all locations and all services (although different ES were tested across pilot sites)?

Our assessment on how the vision had evolved through the analysis of strategic FSC documents was supported by the responses from the interviews. At the beginning, the vision was vague and hard to operationalize. Although respondents were clear on the broad vision "to promote responsible management of forests for local livelihoods and forest resources" at the beginning of the ForCES project, they were less clear about the expected form of the outcome. When asked about the current vision in 2016, all respondents reported a more specific vision on FES certification and also felt confident in explaining it to a potential ES buyer. They also indicated its usefulness in attracting the client's attention and reported having used it in practice. For example, in three of the study sites the vision has been used for establishing watershed PES agreements, and in the Charnawati site in Nepal it led to a local payment scheme for hydrological services in which the FES certification was used as a verification tool. However, it was also highlighted that the vision for FES certification came too late to be properly pilot tested under the ForCES project; in one respondent's opinion, "[it] should not be put for use for everybody until tested properly".

3.2. Social networks at the ForCES sites

The social networks developed in the four study countries were similar in their composition. They included NGOs, government agencies (from local to national level), local communities, academia, and in some cases, international development organizations. The respondents reported difficulties in getting local communities to participate actively, due to skepticism, low levels of understanding or else time constraints. Furthermore, certifying bodies were not well represented and the business community (beyond the timber companies managing three sites) was only marginally involved in the initial set up of the social network, as the focus was on those actors that would support project implementation and help develop the national FSC standard for FES certification. The lack of specific details about certification and benefit models may explain the absence of the business community seen in the results. Yet, from the "seller" side, including those either directly or indirectly involved in improving the livelihoods of the communities providing the ES, there was sufficient satisfaction with the broad vision to participate in the project. As the time came to test the standard through audits, certifying bodies became part of the social networks. It was suggested in the interviews that certifying bodies and Accreditation Services International (ASI) should have been involved in the development process from early on, as they possess valuable knowledge of the weaknesses and strengths of the verification dimension of a certifiable system.

The contribution of the vision to building social networks has been limited, mainly because social networks were built before a concrete vision of the certification tools and their benefits for certificate holders, emerged. Thus, rather than talking about the exact form and benefits of FES certification, the respondents used the importance of ES and their benefits as a starting point for building the networks and described how certification can help guarantee the provision of ES through sustainable forest management. In three of the study sites, participatory processes were used from an early stage to build knowledge of all stakeholders directly involved in the resource management, define good management practices and to map locations of the chosen ES. Based on the interviews, stakeholders were committed to continue with the vision for sustainable resource management for ES provision beyond the project, and talked about broadening the use of participatory processes to other sites.

3.3. Key lessons learned regarding niche development

The main learning experiences that were assessed related to the development of the national FSC standard, finding buyers for certi-

Table 3
Main lessons learned on the key processes studied, and specific issues linked to them based on the interviews.

Main lessons learned	Specific issues mentioned by the respondents
National FSC standard development	
Needs to be managed as a political process	Requires time as members of standard development committee are volunteers and people have other priorities Historical conflicts between stakeholders Inclusion/exclusion of stakeholders ("right" stakeholders need to be identified) Relationship between FSC and other certification standards Lack of understanding why a new FSC standard is needed Lack of ownership of the process
Strong technical expertise helps	The linkages between ES and forest management unknown General indicators even at national level may not fit the local circumstances FSC certification is technically complex Low awareness and knowledge about certification
Market aspects	
Need for a compatible regulatory framework	Forestry law focused on timber and silviculture ES not mentioned in requirements of forest management plans ES have no formal place in forestry regulations Legal framework for trading ES does not exist Policy changes are outside FSC control Certification not seen as relevant by policy-makers
Difficult to find buyers for new innovation	Low awareness of ES among buyers – difficult to convince of benefits Buyers need clear process and actual outputs Markets for ES not developed at national/local level Obstacles to accessing international markets → support needed from FSC global Local people think short term [in a poor country]
Capacity-building	
Understanding of ES needs to be developed	ES is a new concept for local people and other stakeholders Skepticism among forest managers – difficult to convince on certification or ES benefits
Certification is a complex system	System difficult to understand No FSC representative in the country to give support No one in the country can officially talk about FSC to stakeholders Lack of expertise in certification within country: rests on projects and small number of individuals Auditor may not understand local situation if the person comes from outside the country
Community-level monitoring might be a challenge	Will community-based monitoring be enough and is it trustworthy? Can certificate holders do monitoring? FSC ES tools are quite technical and science based Monitoring not well defined in FSC system Proper guidance and training needed

ES = ecosystem services; FSC = forest stewardship council.

fied ES, and capacity-building needs (Table 3). The respondents acknowledged the complexity of developing a national FSC standard for FES certification, which needs to be managed as both a political and technical process. Compared to timber management certification, FES certification has a broader range of beneficiaries who may be directly affected by management decisions. They, in turn, can have a direct impact on ES provision, either within or outside the managed area. The political aspects highlighted in the national standard development process were linked to ownership of the process in itself. In the words of one respondent, "Once they [the stakeholders] understood what the FSC Principles and Criteria are, and got involved, they owned and supported the process to enhance and expand it". Ownership is what three of the interviewed country managers also referred to as the need to identify the "right" stakeholders and recognize their expertise and true interest. Hence, the term "right stakeholders" refers to people's motivation to participate and complete the voluntary process. In one of the study countries, one person prevented the development of a steering committee for standard development due to historical conflict, which hindered the national standard development process for several years. The term "right stakeholders" also refers to the need to have technical expertise on ES and certification among those involved due to the complexity of certification and to the often context-specific linkages between management actions and ES provision.

According to the respondents, the lack of clarity about the exact form of future FES certification, for example, whether it will be an independent scheme or an add-on to existing forest management certification, hindered the development of a FSC national standard. Respondents also questioned whether the development of a national FSC standard could be based on only a few pilot sites – a problem that was somewhat alleviated with the publishing of the International Generic Indicators (IGIs) by the FSC in 2014 (FSC, 2014). However, in two of ForCES countries progress to have voluntary FES certification in the national standard or the national standard development itself was hindered because one member of the national standard development group objected either to a specific indicator included in the IGIs or to the whole ES annex contained in the IGIs to be transferred into the national standard.

All respondents were unanimous in that finding ES buyers had been difficult. Three perceptions were commonly shared. First, that it is hard to operate without a suitable regulatory framework. That is, as found in some of the study countries, FES have no formal place in forestry regulations. In Nepal, for example, forestry regulations focus on timber and silviculture, and ES are not mentioned in forest management plans. And in Vietnam, for example, there is no legal framework for the financial trading of ES. The lack of official status in public regulations might also explain why FES certification was not seen as relevant by policy-makers in some of the study countries.

The second perception is that both the certification scheme and benefit models (i.e. the business strategies on how the FES certification will create benefits) should have been ready early on, to bring interested people on board. As one respondent pointed out

"you cannot go and sell without the certification and benefit models or the FSC-approved promotional claims" [as you don't know what you are selling or how]. This is especially important in the light of doubts expressed by respondents during project implementation; in some sites potential certificate holders were skeptical about the FSC certification scheme and its credibility in maintaining forest values, and in general about the need for certification. Respondents also reported skepticism among some forest managers about ES-related benefits. Thus, the need to have a clear business case for FES certification was raised by the respondents, either in reaction to the low level of awareness on the importance and contribution of ES to human well-being, especially at local levels, or as a way to align with other programs such as REDD+. One respondent said that the so-called "green buyers" are already convinced, so they should be easier to attract, but very few of the respondents had a clear idea who are the buyers that should be contacted; except for hydrological services, where a local buyer was identified in those sites focused on watershed management.

The third shared perception among respondents was on the need for strong efforts in finding ES buyers. Dissemination activities to raise awareness about FES certification and the benefits of ES were mentioned by the majority of respondents as a key activity at local and global levels. Respondents said the global leadership should have been more active in developing contact networks, which would have anchored the innovation to the broader FSC system early on. A suggestion was that the FSC Key Account Management Program (that manages relations with existing and potential corporate partners) could have linked ForCES pilot sites with potential ES buyers. The perceived lack of support from the International FSC office may stem from difficulties faced by the country teams when trying to achieve all of the project objectives with relatively few resources. "There were too many things to develop under one project," as one respondent put it.

The respondents also highlighted the need for capacity-building and awareness-raising. The capacity-building needs fall under two categories: building of technical capacities (especially related to certification and monitoring) and increasing understanding of ES and the FSC certification system. The former includes writing management plans, training on NTFP harvesting and developing harvesting plans, and ensuring monitoring continuity; whereas the latter is more focused on increasing understanding of different concepts such as the ES themselves, FPIC and PES. The participatory processes mentioned earlier contributed to building the understanding and capacities of those involved. In the words of one stakeholder: "Now I understand what is important for them [the other stakeholders using the same area] in the forest and I can work to protect it". Community-based monitoring was highlighted from both capacity-building and policy perspectives. Although the interviews and field visits provided evidence of successful community-based monitoring after training had taken place, its credibility in fulfilling FSC certification requirements was questioned in the interviews.

4. Discussion

4.1. Developing policy innovations through local-level learning

This study focused on how the internal factors at the niche level (i.e. articulation of vision and expectations; building of social networks; and learning processes) contributed to the development of a FES certification scheme as part of the ForCES project. We observed three phases in the development of the vision for FES certification: the initial phase, main development phase and operational phase. The operational vision emerged rather late during the ForCES project and hence had limited use for building the social networks and various processes at the local level; including finding ES buyers and developing a FSC national standard. Therefore, our analysis suggests that in the specific case of the ForCES project, the transformation from a pilot innovation into an operational market-based tool is still incipient.

Yet important steps were taken towards the generation of tools for operationalizing FES certification through local-level learning in the ForCES project. Our results show an interactive relationship between the local sites and the FSC in development of the FES certification, concurring with theoretical expectations (Geels and Raven, 2006; Schot and Geels, 2008). Although the FSC had a broad management vision for a long time (based on the FES-related safeguards included in the forest management standard), it was only through local-level learning within a specific pilot project such as ForCES that its vision resulted in FES becoming a formal, albeit voluntary, part of the FSC forest management certification as specified in the IGIs (FSC, 2014). However, the tools to assist certificate holders to access new markets as mentioned in the ES strategy (FSC, 2015a) and the IGIs (FSC, 2014), such as the "FSC Procedure for Demonstrating the Impact of Forest Stewardship on Ecosystem Services", are still under development. It is hoped that their further construction will benefit from the evolved vision that emerged during the course of the ForCES project.

Local participation in project design and implementation as well of monitoring management outcomes raise environmental awareness, generate social learning and build trust between different stakeholders (Becker et al., 2005; Poulsen and Luanglath, 2005; Villaseñor et al., 2016). We found similar outcomes in our analysis as those involved in participatory processes during the implementation of the ForCES project reported increased understanding of the ES concept. However, the use of community-based monitoring was questioned by some of the respondents in terms of credibility and capacity: Will community-based monitoring be enough and is it trustworthy? Can certificate holders do monitoring? We believe this is possible as there are many examples on the success of local monitoring practices regarding for example watershed services and biodiversity (Becker et al., 2005; Danielsen et al., 2007; Gomani et al., 2010).

4.2. Enhancing local adoption of FES certification

Our analysis highlights the importance of social networks and their need for linking the local to the global so to ensure uptake of policy innovations. Building a supportive constituency for FES certification globally will be critical for moving from a pilot to a market-based approach, as shown in the context of other innovations (Schot and Geels, 2008). Three key steps are required to this end: (1) identification of the actors that can transmit information effectively among their social networks; (2) identification of "visionary forerunners" that believe in FES certification and have the power to promote and drive innovation; and (3) establishing commitment within organizations, as this generates ownership towards the innovation itself (Smith and Stirling, 2008; Schot and Geels, 2008).

That said, both horizontal and vertical social networks need strengthening. Horizontal networks comprise actors within nation states that are in a position to expand the adoption of FES certification, either by disseminating information (e.g. FSC national offices) or by using it (e.g. water companies and local communities). The vertical network refers to how ownership and knowledge of FES certification schemes will need to move from the ForCES project and FSC International to other parts of the FSC system, such as FSC national offices, or actors linked with the FSC system (certification bodies). Then, both networks can be used to influence the different stages of the regulatory process (agenda setting and negotiation, implementation, and monitoring and enforcement)

in order for FES certification to break into the forest governance regimes and subsequently change them.

Certification, as a policy instrument, is geared towards large companies, due to its complexity and costs (Eba'a Atyi et al., 2013). However, the FSC facilitates the certification of "small and low intensity managed forests" (SLIMFs) as well as group certification. Companies are also under pressure to get certified as a safeguard measure since sustainability issues are increasingly scrutinized by the media (Holt and Barkemeyer, 2012). Smallholders may have less of a need to get their forest certified – a situation that could change with greater recognition of ES and potential market access that comes with it. So far, no specific adapted requirements for FES certification regarding SLIMFs have been published. In fact, group certification holders may be in an advantageous position in regard to obtaining FES certification as they are allowed to demonstrate the impacts of management activities at the group level. Previous studies suggest that certification delivers co-benefits such as improved local decision-making institutions and benefit-sharing mechanisms (e.g. Cerutti et al., 2014; Poffenberger, 2015). Thus the potential of certification of FES as a safeguard should not be overlooked.

The perceived skepticism about FSC certification and ES-related benefits expressed by some of the stakeholders in our study points to a need for the FSC to improve its credibility as it embarks on its mission to increase its market share and to be "the leading catalyst and defining force for improved forest management and market transformation, shifting the global forest trend towards sustainable use, conservation, restoration and respect for all" (FSC, 2015b). Distrust in the FSC's credibility has also been reported elsewhere (e.g. McDermott, 2012; Moog et al., 2015). It is crucial for the FSC to establish trust if it wants to function as an enabler of ES market access for certificate holders. Based on previous research, improved market access from certification is not at all guaranteed, especially in the case of smallholders (Carlson and Palmer, 2016). Currently, demand for FES certification in the markets is limited (Hodgkinson and Labrasca, 2014; Ecosystem Marketplace, 2014) although investment in watershed services and biodiversity conservation has increased in recent years (Bennett and Ruef, 2016; Hamrick, 2016). The move towards successful market adaptation is aided by the development of business models (as these can be tested in practice and modified based on experiences), as well as by the relatively high adaptability of key FSC stakeholders (such as certification bodies and FSC enabling partners) to incorporate FES into their work (Jaung et al., 2016).

The need for capacity-building, as found in our analysis, calls attention to the disconnections between local realities and global academic and policy processes while highlighting the need to build a constituency that connects both dimensions. It further emphasizes the importance of a properly conducted FPIC processes to ensure that local communities fully understand how activities will affect them before providing consent. Establishing mutually agreed grievance procedures in advance will provide additional safeguards against unforeseeable outcomes (Colchester, 2010). The perceived need for capacity-building also highlights some of the challenges FES certification may face on its way to a fully fledged market tool. It is known that different stakeholders have varying perceptions and access to ecosystem benefits (Díaz et al., 2011). Limited knowledge capacity can further hinder local market creation and adoption of policy instruments related to ES provision. Other challenges may need to be overcome, such as the contrast between the location of potential ES markets and FSC uptake. The majority of ES projects target developing countries where the FSC has limited adoption (Marx and Cuypers, 2010).

One proposed solution for increasing the capacity of potential certificate holders, especially local communities, is to apply participatory processes to build knowledge, agree on best management practices and to map the sources and sinks of selected ES (Becker et al., 2005; Danielsen et al., 2007; Paudyal et al., 2015; Pokorny and de Jong, 2015; Poulsen and Luanglath, 2005). Our analysis of stakeholder involvement at the early stages of the ForCES project suggests adoption of the concept of sustainable resource management, although it is too early to say that definite behavioral change has taken place. Participatory mapping of ES is especially informative as it helps to clarify what is meant by ecosystem services and to reveal which ES people perceive to be important and their locations. Mapping ES supply can help empower marginalized people in natural resource management and increase their participation in decision-making (Paudyal et al., 2015). It can also help ensure that the full suite of ES and their beneficiaries are also included as perceptions differ both across experts and local people, and between men and women (Abram et al., 2014; Fagerholm et al., 2012).

4.3. Changing forest governance through policy innovations

Perhaps the greatest change detected at the local level in our analysis was improved knowledge capacity. We advocate that increasing public understanding of ES might be the greatest value of FES certification at the global level, once both the concept and the scheme is in use. Earlier research shows that certification can influence all stages of the policy process from the moment it enters the national arena: agenda setting and negotiation, implementation, and monitoring and enforcement (Savilaakso et al., 2016b). It also shows that by introducing new concepts in national policy arenas, voluntary certification standards promote and shape sustainability transition processes (Manning and Reinecke, 2016; Savilaakso et al., 2016a). So far the broader sustainability goals have been translated into standards through an evolving set of manageable, adaptable and quasi-independent governance modules (e.g. "soil conservation" and "child labor") (Manning and Reinecke, 2016). The introduction of the ES concept is a deviation from the earlier modules because of its broad coverage and its strong linkages to other modules (e.g. FPIC, high conservation value forests and benefit-sharing). Thus, instead of introducing a new module, it strengthens and changes the existing modules. Nevertheless, the increased recognition and knowledge of ES provision through voluntary certification standards may create enough push to change current forest governance regimes in many countries towards broader sustainability in resource use.

4.4. Limitations of the study

Our results are based both on secondary information as well as responses of a limited number of informants. As the 10 pilot sites across the four countries were purposefully chosen to represent different sociopolitical and environmental conditions, we argue that our results may offer generalizable lessons, especially as the field of certification of ecosystem services is a relatively novel endeavor. In order to gain a broader knowledge about the process of a policy innovation and social networks associated with FES certification, we suggest more targeted sampling of the second-order social networks in the future (i.e. those supporting the innovation but not part of the original group behind the innovation).

5. Conclusions

This paper focused on the three internal factors thought to influence innovation in natural resource management through the niche development theory: (1) articulation of expectations and visions by those behind the innovation; (2) building of social networks; and (3) the learning processes involved. After studying

a five-year pilot project to incorporate FES into a broader FSC certification system, we found that the vision for FES certification had evolved from general to more specific through local-level learning. Yet the lack of a concrete future scenario outlined at the beginning of the project made it difficult to develop national FSC standards and attract potential buyers. We stress the need for targeted capacity-building throughout the certification chain (from potential certificate holders to auditors), the need to expand social networks to ensure uptake from local to global, and the importance of supporting regulatory frameworks in the context of FES certification. If FES certification can overcome some of the challenges highlighted in our analysis and thus capitalize on its potential opportunities for enhanced natural resource management, it may become a valuable tool for current and prospective FSC certificate holders to access ES markets. In addition, it could contribute to wider recognition of the full value of both natural and restored forests.

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Annex A. Published Forest Stewardship Council documents searched for vision statements

- Strengthening forest conservation, communities and markets. The global strategy of the Forest Stewardship Council. 2007
- Project document for the ForCES project: Expanding Forest Stewardship Council (FSC) certification at landscape level through incorporating additional ecosystem services. 2011
- ForCES project: An opportunity for forest managers. Project factsheet. 2012
- FSC and ecosystem services: Protecting the planet's essential processes. Project factsheet. 2012
- FSC ecosystem services strategy. 2015
- FSC Global Strategic Plan 2015–2020. 2015

Annex B. The interview guide for project managers

Articulation of vision and expectations

I. How has the vision been articulated over time and by whom?
1. From where or whom did you first learn about the vision for FSC [Forest Stewardship Council] ES [ecosystem services] certification?
2. When?
3. How would you describe the vision for FSC ES certification at the beginning of ForCES [Expanding FSC certification through incorporating additional ecosystem services]?
4. What about now?
5. If asked, could you explain FSC ES certification to a potential ES buyer?

II. What has been the role of different stakeholders in developing the vision?
6. Have you participated in developing the vision? If yes, how?
7. Have any other people you work with, in the context of ForCES, participated in developing the vision?
8. Have you or they been consulted (formally or informally) on the vision (e.g. asked to provide comments)?

Building of social networks

I. Who are the actors in the social networks at the local level?
1. Who are the stakeholders involved in the ForCES sites?
2. Are there any other stakeholders involved in ForCES in your country?

II. How have they supported the innovation process?
3. What role do the various stakeholders have?
- Central government
- Local government
- Municipal government
- NGOs [nongovernmental organizations]
- Local communities living within the pilot area
- Local communities living outside the pilot area
- Academia
- Certifying bodies
- Other standards (e.g. carbon)
- Buyers (timber, NTFPs [non-timber forest products], ES)
- Development organizations (USAID [United States Agency for International Development], SNV [Netherlands Development Organization], GIZ [Deutsche Gesellschaft für Internationale Zusammenarbeit] etc.)
- Others

III. Has the vision contributed to the building of social networks?
4. Have you used the vision to get people involved in ForCES?

Learning processes

I. What are the challenges that have been faced when implementing the vision?
1. Have you faced any challenges while working towards ES certification?

II. What solutions have been found for the challenges?
2. How did you resolve the challenges?

III. What have been the key lessons learned?
3. What are the key lessons you have learned on:
- Developing the FSC standard;
- Finding buyers for ES; and
- Implementing field activities (e.g. monitoring)?

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