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What scope for certifying forest ecosystem services?

Erik Meijaard [a,b,c,*], Sven Wunder [d], Manuel R. Guariguata [c], Douglas Sheil [c,e,f]

[a] People and Nature Consulting International, Country Woods 306, Jl. WR Supratman, Pondok Ranji-Rengas, Ciputat, 15412 Jakarta, Indonesia
[b] ARC Centre of Excellence for Environmental Decisions, Centre for Biodiversity & Conservation Science, University of Queensland, Brisbane, Australia
[c] Center for International Forestry Research, Bogor, Indonesia
[d] Center for International Forestry Research, Rio de Janeiro, Brazil
[e] Department of Ecology and Natural Resource Management, Norwegian University of Life Sciences, Ås, Norway
[f] School of Environmental Science and Management, Southern Cross University, Lismore, Australia

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ABSTRACT

Ecosystem services have rapidly moved to the mainstream of environmental policies. Certification has for decades been a market-based tool for sustainability. Here, we assess whether certification of ecosystem services supports forest management and conservation. We look at forest ecosystem services, such as water regulation, carbon sequestration, and pollination provision, and evaluate the opportunities and constraints for developing systems to certify them. We discuss a series of challenges, and suggest that caution is needed: insufficient demand for multiple services, high biophysical service complexity, and elevated monitoring costs all indicate that opportunities for large-scale commercial viability of certified forest ecosystem services are limited. While some certification already exists for forest carbon services, we expect the certification of other services to remain a minor niche that seldom justifies major subsidies.

1. Introduction

Certification has generated considerable interest as a means to achieve improved environmental and social outcomes in forests and forest landscapes (Auld et al., 2008). But successful certification remains hard. Forest product certification has generated numerous debates and a broad critical literature relating to its claims, viability and achievements (Putz et al., 2000; Cashore et al., 2003; Rametsteiner and Simula, 2003; Auld et al., 2008; Tikina et al., 2008; Ebeling and Yasue, 2009; Zagt et al., 2010; Clark and Kozar, 2011; Angelstam et al., 2013; Romero et al., 2013; Visseren-Hamakers and Pattberg, 2013). In this article, we consider not forest products but forest ecosystem services (FES). While many of the challenges facing the certification of forest products will also apply to FES we shall highlight four challenges that cause us specific concern and lead us to conclude that certification of FES will face greater obstacles than products. Our approach is to first briefly explain the principles of certification and how they apply to forest products and ecosystem services. In Section 2 we consider "demand side constraints", and highlight the challenge of finding sufficient buyers. In Section 3 we consider "supply side constraints" and the high costs and technical difficulties of certification. In Section 4 we consider options for progress.

1.1. Certification theory

Certification is a guarantee that a given product or process complies with an agreed set of rules. Certification initiatives aim to set and implement standards, and communicate them transparently to the external world, in particular the actors in a commercial chain of products or services (e.g., Marx and Cuypers, 2010). Certification generally requires a demand for certified products or services ("consumer markets" in Fig. 1). This includes certification that focuses mostly on the end product (e.g., foods that do not contain trans-fats), intermediate cases where there is both a concern for the end product and about its production (e.g., organic products), and certification that concerns mostly the production and marketing process (e.g., Fair Trade coffee). In the latter case, consumers (individuals, households, firms, or public agencies) care particularly about the conditions under which marketed goods have been produced. Certification thus becomes a tool helping buyers of a market commodity, whether at the consumer or retail stage, to distinguish different types of products or services according to whether or not they have certain underlying, often non-observable, desirable features. For instance, certified "biodiversity-friendly" coffee entails the principle that the coffee commodity and biodiversity protection are sold jointly to the same consumers, who can choose whether they want to buy it ("selling biodiversity in a coffee cup") (Pagiola and Ruthenberg, 2002). This implies either that the core commodity production and trade do little if any harm to the bundled side objective or, that it actively improves it (e.g., better worker conditions, producer profits).

* Corresponding author. Tel.: +62 812 5514006.
E-mail address: emeijaard@gmail.com (E. Meijaard).

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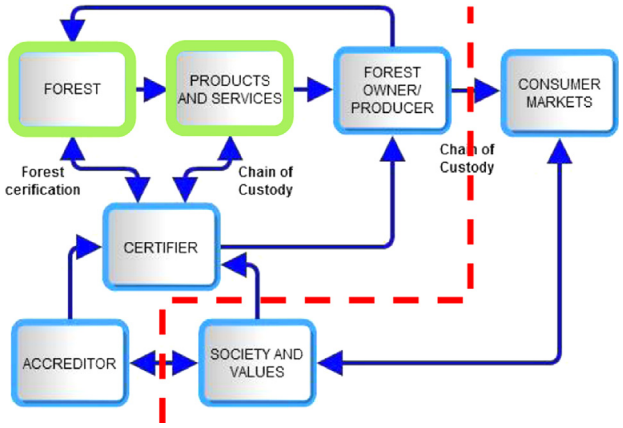

Fig. 1. Components of certification (adapted from Sprang, 2001). The red line emphasizes the importance of consumer markets and societal values for developing viable certification systems for FES. If actors to the right of the red line do not push for certification, its relevance will be questionable. "Chain of custody" refers to the value chain that allows consumers to determine where products originated.

A certification system needs to be accepted at each step along the production and marketing chain, e.g., with wholesale, retail and end-user markets willing to care for the certification (Chen et al., 2010). It therefore assumes potential buyers who care enough to pay ("Society and Values" in Fig. 1). Independent certification assumes that key information about the product or service is unavailable: if origin, qualities and impacts are apparent and evident, certification would not be needed, as it would not provide anyone involved with additional knowledge. Second, it also requires some agents (e.g., a market) to benefit from the differentiating effect of certification. At the extreme, if a product chain involved only one consumer and one supplier, engaging a third party to certify the product adds unjustified transaction costs to a business deal where the buyer could self-verify any aspect of the production system. Finally, from a market perspective, certification should lead to a premium price paid by the consumer of the certified product, which could pay for the incremental cost of "good stewardship" by the producer, and for the costs of certification.

Direct market incentives or disincentives are not the only driver of certification. Other considerations, such as reputation, relationships and perceptions also matter in various ways (Araujo et al., 2009; Chen et al., 2010; Lannelongue and González-Benito, 2012). For example, certification is a way to exclude undesirable (e.g., illegal or irresponsible) producers who are unable to achieve certification. For producers, certification is about gaining market incentives as well as about avoiding disincentives. Understanding where the original demand for certification comes from—the seller, the buyer, the verifier, or a combination—helps in deciding what kind of certification system suits a particular market context. This is because different stakeholders have different preferences and requirements for what certification should achieve. These preferences and requirements affect costs and the system's financial viability.

Certification requires the voluntary participation of providers. This exposes certification to a selection bias: those producers who already perform close to the required standard will be the most motivated to join, since their immediate opportunity costs are minimal. If there is widespread pre-certification compliance with good standards, the certification programme's short term additionality (i.e., the environmental impact over and above status quo) will be limited; focus will be more on rewarding good stewardship and the consolidating functions this can lead to (Persson and Alpízar, 2012).

1.2. Forest certification

Independent certification, related to sustainable forest management, was first proposed by the International Tropical Timber Organization (ITTO) in the beginning of the 1990s. The first working example of a certification body was the Forest Stewardship Council (FSC), founded in 1993 by environmental non-governmental organizations (NGOs), retailers and some private foundations. It focused on timber production and trade. Additional certification systems were subsequently developed and introduced by the forest industry and governments (Meijaard et al., 2011), including certification of non-timber forest products, such as rattan, nuts and medicinal plants (Guedes Pinto et al., 2008; Shanley et al., 2008). Two decades later, over 30 forest certification systems have been developed, with more than 500 million ha of certified forest (Meijaard et al., 2011), equalling approximately 15% of global forest cover (FAO, 2010), although only 1.5% of tropical and subtropical forests had been certified by 2008 (Bennett, 2008). Various constraints to forest certification have been identified. Limited market demand for certified products is a major impediment (Meijaard et al., 2011). On the supply side, the scale of operations and quality of governance are important considerations (Ebeling and Yasue, 2009), while high upfront costs, insecure tenure, and high concentrations of commercial timber can also limit adoption of sustainable forest management practices, especially affecting tropical forests (Putz et al., 2000).

1.3. Forest ecosystem services certification

Several organizations have been developing certification systems that explicitly include FES, such as pollination, flood buffering or carbon storage (FSC, 2010; WWF, 2011). This includes FSC's Forest Certification for Ecosystem Services (ForCES) project, while other initiatives are being developed by forest carbon organizations. For example, Gold Standard and FSC recently agreed to jointly leverage their respective approaches to social and environmental safeguards for carbon certification (Peters-Stanley et al., 2012). Together with other financial mechanisms such as direct payments for environmental services and tax incentives, certification is intended to reward forest managers for providing environmental services, as well as possibly other co-benefits. Given the multiple societal demands on forest ecosystems, certification of FES is considered a logical progression from timber certification (FSC, 2012). The two share many characteristics, but, as we will explain below, there are crucial differences.

To inform the process of FES certification, we evaluate here what possible constraints and barriers may exist, and to what extent FES certification is a viable means to promote sustainable forest management. We specifically consider ecosystem services (ES), as distinct from goods and products. In economic terms, services are intangible commodities. In ecological terms, services include those biophysical processes that contribute to production, to human wellbeing or value. For example, carbon fixation generates wood and insect pollination results in fruits. Both human-induced and intrinsic variability in the rate of service delivery will inevitably result in variable yields. The Millennium Ecosystem Assessment (2005) lumped goods (termed "provisioning services") with what we consider "genuine" services, and this alternative classification is currently used by many (Wallace, 2007), but may have confused the ecosystem service concept more than it has informed it (Boyd and Banzhaf, 2007; Buyers, 2008). Forest goods or products differ substantially from services in the way they are made, owned, shared and consumed. In addition, many types of extraction processes for goods (e.g., timber, non-timber forest products) can have negative environmental impacts (externalities), and there are often pronounced trade-offs with service