



Standards and guidelines for forest plantation management: A global comparative study



Mauro Masiero, Laura Secco*, Davide Pettenella, Lucio Brotto

Department of Land, Environment, Agriculture and Forestry (TESAF – Territorio e Sistemi Agro-Forestali Department), University of Padua, Viale dell'Università 16 – AGRIPOLIS, 35020 Legnaro, Padova, Italy

ARTICLE INFO

Article history:

Received 7 May 2014

Received in revised form 4 December 2014

Accepted 20 December 2014

Available online 26 January 2015

Keywords:

Forest plantations

Planted forests

Forest management standards and guidelines

Comparison

Gap analysis

ABSTRACT

The increasing area covered by forest plantations creates a demand for trustworthy mechanisms to ensure they are responsibly established and managed. In the last twenty years efforts have increased to develop standards and guidelines as voluntary-based policy tools for guaranteeing sustainable forest management. However, most are focused exclusively or prevalently on natural or semi-natural forests, while only a few are specific to planted forests or plantations. Many differences can be identified among existing standards and guidelines that can be applied to planted forests and forest plantations. The paper, which main aim is to assess whether and to what extent planted forests are properly considered within the existing sets of standards/guidelines and to identify areas for improvements, is based on a series of comparative analysis. Both quantitative (number) and qualitative (quality in terms of coherency, consistency and completeness) aspects of indicators for addressing environmental, economic and social issues are considered. First, 42 standards/guidelines are classified and compared. Secondly, 3 standards for forest certification and 3 guidelines developed by international organisations are compared. Finally, a gap analysis is carried out with respect to an ad hoc “reference standard” with 386 indicators. Ball-charts, radar graphs and histograms are used to show results.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Planted forests have represented a common land use and a very important resource for centuries. While plantation forestry has a long history in many countries, the development of a globally significant plantation estate and the establishment of large-scale planted areas is a relatively new phenomenon (Evans, 2009). Today, planted forests constitute about 6–7% of the global forest area, covering around 264 million (M) ha, with a steady increase in all regions since early 1990s. In the last ten years, the area covered by planted forests worldwide has increased by an average of almost 5 M ha/year: East-Asia, Europe and North America have the greatest coverage, together accounting for about 75% of global planted forest area. East-Asia alone makes up 35% of the total land, mainly due to China (FAO, 2010). Planted forests provide about 50% of global wood production (FAO, 2007) and 32% of industrial wood production (Buongiorno et al., 2012) with forecasts suggesting an increase of up to 80% by 2050 (Carle and Holmgren, 2008). Considering the projected increasing importance of this controversial land use, we think there is a need for scientists, practitioners

and policy makers to better understand, more carefully plan and more responsibly manage forest plantations worldwide.

Planted forests vary widely, not only in terms of species, location and size, but also for their main purposes, from primarily protective functions to exclusively timber production. Forest plantations, defined as “forests of introduced and/or native species established through planting or seeding either for productive or protective purposes” (FAO, 2006), cover about half of the total planted area (140 M ha). Forest plantation issues and their relationships with natural forests are complex (White, 2003; Bull et al., 2006) and sometimes controversial, fuelling strong debates among forestry stakeholders about their potential multi-functionality as well as their positive and negative impacts.

On the one hand, although plantation forests are typically assumed to be poor substitutes for natural ones, according to many authors and several studies (e.g. Parrotta, 1995; Parrotta et al., 1997; Sedjo and Botkin, 1997; Bernhard-Reversat, 2001; Carnus et al., 2003; Montagnini et al., 2003; Toma, 2004; Kanowski et al., 2005; Montagnini et al., 2005), they can play an important role in the provision of a variety of ecosystem services, when compared with agriculture and other forms of land use or when natural forests have been degraded (Pawson et al., 2013). More in general, plantations help to relieve pressures on natural forests, contributing to reduce the harvest by about 20% in Africa, 23% in North-central America, 33% in Europe (on average, –26% at global level) and thus supporting the maintenance of ecosystem services from natural areas. According to this perspective, even if forest

* Corresponding author. Tel.: +39 0498272692; fax: +39 0498272750. Skype: laura.secco.

E-mail addresses: Mauro.masiero@unipd.it (M. Masiero), laura.secco@unipd.it (L. Secco), davide.pettenella@unipd.it (D. Pettenella), lucibrotto@gmail.com (L. Brotto).

plantations are mostly (80%) intended for timber production (FAO, 2007), thus contributing towards meeting the growing global demand for timber and wood fibre, they often supply nontimber forest products (NTFPs) and contribute substantially to the provision of a wide range of other social, economic and environmental benefits. They assure forage, wildlife habitats, watershed and soil protection, recreational settings, aesthetic vistas, and ecological conditions for many other forest services, including carbon sequestration (Boyle, 1999; Evans and Turnbull, 2004; UNEP, 2009). Forest plantations, for example, represent the bulk of the 15 afforestation and reforestation projects implemented so far under the Clean Development Mechanism (CDM) of the Kyoto Protocol (UNFCCC, 2013). Plantations also play a central role in the voluntary carbon market: although the market share of afforestation/reforestation (A/R) projects has dropped significantly compared to 2011, together with reducing emissions from deforestation and forest degradation (REDD) projects they remain the most transacted forest offset type (Peters-Stanley et al., 2013). According to FAO (2010) figures about 25% of the world's forest plantations are established for protective purposes. These figures might be even higher because a large proportion of the increase in planted forests in the last years has taken place in China where many plantations are established for protective purposes, including desertification control and protection of soil and water resources. In terms of social benefits, plantations can directly or indirectly create employment, boosting the development of the wood–paper industry at local/national level; moreover, especially in Southern countries, plantation projects are often developing side healthcare programmes (e.g. HIV/AIDS programmes), providing resources and opportunities for children's education (schools, etc.), assuring job training for poor people, etc. (Bull et al., 2006).

On the other hand, according to other opinion makers, forest plantations are often described as “[...] *biological deserts, water guzzlers, livelihood saboteurs and carbuncles on the landscape*” (IUCN and WWF, 2006 – p. 1), replacing diversity with monocultures, local species with exotic ones, causing or hastening soil erosion and loss of fertility and excessive water consumption. In this perspective, while subsidising forest plantations has been a common practice (Szulecka et al., 2014), its effectiveness is debatable, since this may act as a disincentive to sustainable management of natural forests. Also, by flooding the market with cheap timber and fibres they can either make natural forest management uncompetitive or, on the contrary, help in raising consumer demand for wood products from both planted and natural forests (IIED, 2004; Buongiorno et al., 2012). In many cases, a lack of due diligence in financing forest plantation initiatives and connected investments (Spek, 2006) has been demonstrated, with public funds used to establish plantations in inappropriate sites, using poor genetic material, poorly managed or sited too far from markets. These mistakes can erode values of investment over time, which, when coupled with time-related uncertainty and risk, creates new challenges for raising capital for plantations (Cossalter and Pye-Smith, 2003; Brotto and Pettenella, 2012). More recently, afforestation/reforestation projects established for the purpose of carbon sequestration under either the CDM or REDD + mechanisms have in many countries been associated to land grabbing (e.g. Uganda and many other African countries) and/or unsustainable land uses/management (Görge et al., 2009; Cotula, 2010; Oxfam, 2011; Deininger and Beyerlee, 2011; Anseeuw et al., 2012; FOEI, 2012).

Relevant potentials and challenges of plantations are connected with their growing role in providing timber and globally-sensitive environmental services, the conflicting positions of stakeholders about their effects on natural forests and people (namely, forest industries vs. environmental/social movements), the real impacts they might have on the environment and people, and the large and increasing amount of forest plantation investments worldwide. Despite all this, relatively few scientific papers have been published addressing these issues, in a systematic fashion. The scientific literature on plantations mostly references medium- to small-scale cases in different contexts, exploring, for example, the ecological effects of plant regeneration in restoring

Mediterranean forests (Gomez-Aparicio et al., 2009), the potential positive impacts of multi-purpose plantations (Paquette and Messier, 2010), the potential socio-economic impacts of introducing forest plantations to rural households (Landry and Chirwa, 2011), the management practices that can contribute to improve water conservation in forest plantation landscapes (Ferraz et al., 2013) or providing an overview of policies for forest plantations in a large scale context like China and of main socio-ecological impacts (Turnbull, 2007). Most of these studies are focused on the identification of (often only potential) ecological and social impacts of plantations, either negative or positive, while very limited attention is given to the policy implications of their results and to the definition of common criteria and instruments to evaluate them. Moreover, a limited number of policy documents have so far been drawn up¹ specifically guiding the creation, management and evaluation of plantation investments.

The most common policy instruments currently available for addressing the establishment, management, monitoring and evaluation of forest plantations and improving their governance are sustainable forest management standards (STDs) and guidelines (GLs).² But, among the several STDs and GLs developed in the last 20 years (Holvoet and Muys, 2004; Marjokorpi and Salo, 2007; Clark and Kozar, 2011), which are fragmented, not sufficiently harmonised, overlapping each other or missing key issues, the majority are focused on natural or semi-natural forests while planted forests and forest plantations are considered marginally. Nowadays, more accurate, complete, specific and responsibility-oriented sets of criteria and indicators for sustainable management are required in order to successfully deal with the wide range of special environmental, social, economic and managerial challenges posed by forest plantations. STDs and GLs are considered the most useful policy instruments developed to operationalize SFM so far (Caswell, 2014). Standards or guidelines for natural forests – not having been designed for application to plantations – need proper interpretation. We assume that the more specific the policy instruments are, the more accurate and suitable the forest operations are expected to be, thus positively addressing the impacts of plantations in the long-term. Consequently, we argue that policy makers and scientists have not given enough attention so far in taking into consideration the specificities of forest plantations, both in developing or periodically updating standards and guidelines for assessing progress towards sustainability and management performances, in guiding management operations in the field, and evaluating impacts and effectiveness. Our paper, based on a comparative analysis of selected documents, has three main objectives: i) to investigate whether and to what extent existing standards and guidelines for sustainable development (SD) and sustainable forest management (SFM) specifically take forest plantations into consideration; ii) to highlight similarities and differences among existing standards/guidelines in order to assess their different (potential) effectiveness in ensuring sustainable management of forest plantations; and iii) to identify the main gaps existing between the analysed STDs/GLs and an “idealised (i.e. hypothetical, full comprehensive) list” of requirements for sustainable forest plantations that takes into consideration all environmental, social, economic and procedural issues of their management, with the aim of identifying possible areas for improvement. In the following sections, the **Methodology**, **Results and discussion**, as well as our **Conclusions** are presented.

2. Methodology

The methodology is based on 4 steps: (1) existing STD/GL identification and classification; (2) creation of a “reference standard”; (3) STD/

¹ As reported by Boscolo at the Scientific workshop “Governance, Economics and Trade, Markets, Profitability of Planted Forests” held in Porto (15–17th May 2013), a Sustainable Forest Management toolbox is currently under development at FAO.

² The definitions of “standard (STD)” and “guideline (GLs)” adopted for the purpose of this study are reported in paragraph 2.1.

Download English Version:

<https://daneshyari.com/en/article/91429>

Download Persian Version:

<https://daneshyari.com/article/91429>

[Daneshyari.com](https://daneshyari.com)