

Forest Certifications in Sustainable Forest Management: Concerns Associated to its Application in A Forested Area of Tuscany



Forest Management

KEYWORDS : forest certification, forest marketing, forest management, certification costs.

Roberto Fratini

University of Florence – Department of Management of Agricultural, Food and Forestry Systems

***Francesco Riccioli**

University of Florence – Department of Management of Agricultural, Food and Forestry Systems * Corresponding Author

Toufic El Asmar

Food and Agriculture Organization of the United Nations (FAO) – Plant Production and Protection Division

ABSTRACT

Forest certification was launched over a decade ago to help protect forests from destructive logging practices. The systems adopted by the Italian forests, are based on an independent evaluation, or a certification of an external body. This study aims to define the direct and indirect costs that a logging company must address to achieve forest certification. The reference is to Tuscany (Italy) and some types of forestry enterprise. The study examines the direct and indirect costs to accede to the process of forest certification.

Introduction

“Forest management certification is a procedure whereby an independent verifier audits the management of a given forest area, including the felling and hauling of timber in the forest, in order to determine whether management procedures comply with the certification criteria” (cfr. Gomez-Zamalloa, Caparros and Ayanz, 2011). The certification of forests and wood products is a tool for the sustainable management and marketing now fairly widespread and known to woodland owners and entrepreneurs of Italian timber, although less recognized by consumers. This is due to the presence, since 2001, of national structures of the two most important and widespread forest certification systems: the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification schemes (PEFC). According to the most recent data in Italy 742,914 hectares of forests are certified through the PEFC scheme, while the FSC certified forest area stands at a total value of 52,102 hectares.

The costs and benefits of eco-certification: a data literature review

The costs of certification are often identified as the crucial factor determining the lack of interest, of smallholders, toward the request of certification. Such costs are classified in three main categories:

- Direct costs associated to the actual certification, of which the costs associated to the procurement of all information required by the certifying body (costs of travel and subsistence of non-residents evaluators in the country that is requesting the certification service, can have a strong impact on the overall budget);
- Indirect costs related to the compliance with the criteria prescribed in the sustainable forestry certification protocol;
- Any other costs related to promotional and information events.

Certification process and associated costs Forestry Certification Scheme

The procedure of certification begins with a written request made by the interested forest enterprise to the selected certification office accredited by the national or international responsible body. The applicant (single enterprise or a forestry association) must take care of the preparation of the technical and administrative documentation through the verification of the documents and the collection of internal data related to its enterprise or association (internal audits). This phase usually requires the intervention of an external consultant for helping the enterprise to set-up an environmental management system, that is, the organization and the procedures for the management of the environmental aspects of its activities.

The types of costs to be incurred in order to adhere to a process

of certification

The costs of the FSC and PEFC certification (Pettenella et al. 2000), even if they are not always comparable procedures and therefore of the same timeline, either for forest management or for the chain-of-custody, present some mandatory stages that can be summarized as follow:

1. Preparation Costs, are those costs that considers the necessary effort needed to prepare the documentation, the time card for internal personnel and external consultants for the control of the documentation and the organizational management, as well the eventual modifications to the normal enterprise activities;
2. Costs of actual certification, that include the rate of the notified body, normally based on the number of days of audit which must be added to the fixed costs for the examination of the application for certification and the issuance of the certificate;
3. Costs of maintenance, that represent a type of costs which include the annual audit by the entity to which are added the internal costs to keep active the entire system.

Certification procedures are an important management tool, which is implemented with a very rigorous field testing and monitoring of areas where forestry activities will be carried out. Also important are the verifications achieved with local stakeholders, civil society and populations. This last aspect has clear complicated procedures, which cannot always be carried out efficiently by the owners of related enterprise and forests considering their economic needs (Nussbaum and Simula, 2005).

An application example of forest certification in Tuscany.

The purpose of the survey was to determine the extent of the costs and missing income that forest owners must incur to comply with the standards PEFC, FSC, and the manual for forest management (Brunori et al., 2005). To check the degree of compliance with the rules laid down by the certification protocols, it was necessary to perform a monitoring across the enterprise. The enterprise features must be constantly compared with the standards identified by the protocol of certification and the Manual for Forest Management to ensure that the programming of the adaptation is effective and economically sustainable.

Methodology and results

In this case, the determination of the economic impact of the adaptation measurement model of a Forestry enterprise have been carried out through the “design” of a representative enterprise (forest model) of different dimension (100, 250 and 500 hectares), which includes a forested area divided (in percentage) on the basis of the type of forest existing Regional Forest Inventory of Tuscany (1998). According to this inventory, out of

a total area of 2,229,700 hectares, there are 1,086,000 hectares of forest (47% of land area) distributed among the different types of forests., In Table 1a and 1b, hypothesizing three forest enterprises of different size: 100, 250 and 500 hectares, are reported inside them the same types of forests present in the Tuscan Forest Inventory.

Forest typologies	procurement costs €/m3	Enterprise 1 stumpage value (€)	Enterprise 2 stumpage value (€)	Enterprise 3 stumpage value (€)
Beech	42,00	198,49	99,24	39,70
Chestnut	42,00	530,66	265,33	106,13
Oak	42,00	29,09	14,55	5,82
Total broadleaf roundwood		758,24	379,12	151,65
Silver fir	40,00	135,99	67,99	27,20
Douglas fir and other species	40,00	116,59	58,30	23,32
Total coniferous roundwood		252,58	126,29	50,52
Stump wood	32,00	-155,08	-77,54	-31,02
Chestnut pole	55,00	6869,99	3434,99	1374,00
Beech firewood	28,00	969,83	484,92	193,97
Firewood and chips	40,00	8287,98	4143,99	1657,60
Common locust firewood	40,00	0,00	0,00	0,00
Tot firewood, stumpwood,oth.		15972,72	7986,36	3194,54
Total		16983,54	8491,77	3396,71

Species	Enterprise 1 hectares	Enterprise 2 hectares	Enterprise 3 hectares
high forest			
beech	10,31	5,15	2,06
chestnut	5,08	2,54	1,02
oak	17,44	8,72	3,49
mediterranean pines	35,62	17,81	7,12
austrian pine	9,61	4,81	1,92
silver fir	7,12	3,56	1,42
douglas fir	5,49	2,74	1,10
total	90,67	45,33	18,13
coppices			
oaks prelevant	117,42	88,71	35,48
chestnut	68,12	34,06	13,62
beech	25,19	12,59	5,04
common locust	18,34	9,17	3,67
maquis	39,42	19,71	7,88
total	268,49	164,24	65,69
forest regener. areas	62,94	31,47	12,59
chestnut fruit	17,89	8,95	3,58
total forest	439,99	249,99	99,99

Table 1a- Surface and woody Growing Stocks of enterprises model

Species	production me/ha	Enterprise 1 500 ha growing stock mc	Enterprise 2 250 ha growing stock mc	Enterprise 3 100 ha growing stock mc
high forest				
beech	288,80	2.977,53	1.487,32	594,93
chestnut	226,90	1.152,65	576,33	231,44
oak	166,79	2.908,82	1.454,41	582,10
mediterranean pines	215,35	7.670,77	3.835,38	1.533,29
austrian pine	246,77	2.371,46	1.186,96	473,80
silver fir	381,80	2.718,42	1.359,21	542,16
douglas fir	207,57	1.139,56	568,74	228,33
total	1.733,98	20.939,20	10.468,35	4.186,04
coppices				
oaks prelevant	104,00	12.211,68	9.225,84	3.689,92
chestnut	226,90	15.456,43	7.728,21	3.090,38
beech	288,80	7.274,87	3.635,99	1.455,55
common locust	110,18	2.020,70	1.010,35	404,36
maquis	101,00	3.981,42	1.990,71	795,88
total	-	40.945,10	23.591,11	9.436,09
forest regener. areas	-	-	-	-
chestnut fruit	-	-	-	-
total forest	-	61.884,30	34.059,46	13.622,13

Table 1b- Woody Growing Stocks of enterprises model

The structure hypothesized carries out the exploitation of the forest following a plan of cutting (Table 2) and a forest management plan. These are two key elements that allow access to the certification process. The determination of the costs and loss of income was obtained through the estimation of the products obtainable from forest exploitation typical of the Tuscan territory, according to the different forms of their form of treatment.

Furthermore, the characteristics of the enterprise model were compared before and after adherence to the measure of certification, in order to highlight the differences. We have calculated the economic impact resulting from the application of criteria, indicators and principles of the process of forest certification. The costs and lost revenue that this process involves can certainly be offset by a greater qualification of woody material product. Moreover, the acquisition of a brand (FSC or PEFC) allows then the enhancement of the wood assortment, thus increasing its value added products.

Species	Enterprise 1 500 ha growing stock mc	Enterprise 2 250 ha growing stock mc	Enterprise 3 100 ha growing stock mc	Cicle year
high forest				
beech	33,08	16,54	6,62	90
chestnut	23,07	11,54	4,61	50
oak	32,32	16,16	6,46	90
mediterranean pines	95,88	47,94	19,18	80
austrian pine	39,54	19,77	7,91	60
silver fir	30,22	15,11	6,04	90
douglas fir	20,71	10,36	4,14	60
total	274,82	137,42	54,96	-
coppices				
oaks prelevant	768,84	384,42	153,77	24
chestnut	858,75	429,37	171,75	18
beech	242,46	121,23	48,49	30
common locust	112,23	56,12	22,45	18
maquis	221,21	110,61	44,24	18
total	2.203,49	1.101,75	440,70	-
total forest	2.478,31	1.239,17	495,66	-

Table 2- Yield determination per year for kind of forest (cubic meters)

Considering the farm's strong heterogeneity due to the presence of many types of forests, we have determined according to the different forms of silvicultural treatment, an annual yield imposed by a forestry management plan. On the basis of this yield we have calculated direct costs for silvicultural operation and / or lost income due mainly to the application of certification protocols and for a manual of forest management.

- A. Coppices. The rotation is differentiated according to the dominant species, each utilization must be conducted in order that the surface does not exceed 20 hectares (ref. 20 article, Rule Tuscan Forestry and Law 39/2000).
- B. Regarding deciduous high forest is adopted the minimum rotation, in according to 31 article, Rule Tuscan Forestry and Law 39/2000; the choice of the form of treatment will reflect the purpose or multi-purpose production of forest (beech high forest and high forests of oaks in transition, etc.).
- C. For the high forests of conifers with the prevalence of black (Austrian) pine, we provide selective thinning of high intensity with the aim of reducing the purity pine surface favoring the formation of mixed stands;
- D. The pine forests with a prevalence of maritime pine despite the high reduction due to the passage of the fires, most of the interventions will tend to favor natural regeneration.
- E. Fruit chestnut groves: interventions consist of pruning, cleanups of the undergrowth.

The determination of the costs and loss of income (Table 3a and 3b) was obtained through the estimation of the products ob-

tainable from forest exploitation typical of the Tuscan territory, according to the different forms of forest management and their traditional form of treatment.

Forest typologies	Market price (€)	Enterprise 1 yield per year (m3)	Enterprise 2 yield per year (m3)	Enterprise 3 yield per year (m3)
Beech	48	33,08	16,54	6,62
Chestnut	65	23,07	11,54	4,61
Oak	45	9,70	4,85	1,94
Total broadlea. roundwood	65,85	32,93	13,17	
Silver fir	45	27,20	13,60	5,44
Douglas fir and other species	42	58,30	29,15	11,66
Total coniferous roundwood	85,49	42,75	17,10	
Stump wood	30	77,54	38,77	15,51
Chestnut pole	63	858,75	429,37	171,75
Beech firewood	32	242,46	121,23	48,49
Firewood and chips	48	1036,00	518,00	207,20
Common locust firewood	40	112,23	56,12	22,45
Tot firewood, stumpwood,oth.	2326,98	1163,49	465,40	
Total	2478,32	1239,16	495,66	

Table 3a- Wood assortments obtainable from forest harvesting

	Enterprise 1 500 ha	Enterprise 2 250 ha	Enterprise 3 100 ha
Indirect cost	5.84	3.88	1.91
Direct cost	7.60	15.20	760.00
Total per hectare	1.61	3.22	8.02

Table 3b- Transformation values

The PEFC and FSC protocols adopted by the authors are made up of a series of mandatory elements and some of purely informative ones, while the necessary norms for the adjustment of farm enterprises to the needs of protocols are compulsory and include the costs and lost incomes.

Therefore we quantified in monetary terms the required formalities in compliance with the general forestry characteristics configured previously for the forestry enterprise used as reference, and with the forestry and/or organizational actions. These choices show what the forestry entrepreneur will have to realize to adapt its forest area with the required standards criteria.

Briefly, the considered costs are summarized as follows:

1. Maintenance costs, technical costs of membership and certification protocol (direct costs), whereby they are costs, subsequent to the recognition of eco-certification;
2. Costs or loss of income in respect to the required additional commitments with respect to art. 47 of the regional law.

The total cost per hectare (Table 4), according to estimates made by the authors, if referred to a company having a surface area greater than 100 hectares and up to a maximum of 500 hectares, is between a minimum of 12 Euros and a maximum of 32 Euros per hectare. Following the occurrence of economies of scale and for a more efficient organization, we can gain substantial decreases (between 20 and 25%).

Table 4 - Cost and/or loss of incomes resulting from the application of the joint PEFC FSC protocols and mandatory standards for certified forest area

The granting of an annual allowance (awarded for having adopted a certification procedure) intended to offset the additional costs for planning and getting the forest certification, as well as the loss of income during the period of commitment, could, if introduced into the forestry measures of the regional development programs, refer to the framework of the values assumed by us in Table 4.

Conclusions

Forest certification can also represent an instrument of qualification of the timber according to the new European Union measures related to "Due Diligence" (EU Regulation n ° 995/2010), which establish clear obligations for operators that place timber and timber produce in the market. For obligations that consist of wood traceability of the product that is placed in the market, it's very important to indicate at the end of the risk assessment, the country of origin of the woody material, with the following mitigation steps depending on the level of risk of illegality associated with the considered country. It should be stressed that within the "Timber Regulation" the forest certifications (PEFC, FSC, etc.) are not explicitly referred to be as sufficient evidence to be in line with the requirements.

REFERENCE

- Brunori A., Secco L. (2005). La certificazione FSC e PEFC in Italia, dati e prospettive. Alberi e Territorio, pp. 37-41, Edagricole. | Gomez-Zamallo G. M., Caparros A. Ayanz S.M. (2011). 15 years of Forest Certification in the European Union. Are we doing things right? Forest Systems 2011 20(1), 81-94. | Nussbaum R. and Simula M. (2005). The Forest Certification Handbook, second edition, Earthscan. | Pettenella D., Secco L. e Zanuttini R. (2000). La certificazione della gestione aziendale e dei prodotti nel sistema foresta - legno. Regione Veneto, Dip. Foreste ed Economia montana, Mestre, 2000. | Regione Toscana (1998). L'inventario forestale -Boschi e macchie di Toscana, Giunta Regionale, Firenze, available at www.regione.toscana.it/pro/indexsel.htm. | Vogt K.A., Larson B.C., Gordon J.C., Vogt D.J., Fanzeres A. (2000). Forest certification. Roots, issues, challenges and benefits School of Forestry and Environmental Studies, Yale University. CRC Press LLC. |