

The “not cutting” management: a case study contributing to the debate on sustainability of forest policy

Carbone⁽¹⁾ F., Anselmi⁽²⁾ N., Venzi⁽¹⁾ L.

(1) Department of *Ecology and Sustainable Economic Development* (DECOS)
University of Tuscia, Viterbo. Italy;

(2) Department of *Plant Protection* (DIPRA)
University of Tuscia, Viterbo. Italy;

Introduction

- **Lazio Regional Administration introduced law 43/1974 “Provisions for the protection and development of forest heritage”;**
- **For more than 2.800 hectares of forests distributed almost 38 sites, any forest management activity has been stopped;**
- **Thirty years afterwards, forest researchers of University of Tuscia proposed and obtained regional funds to investigate about the sustainability of that forest policy;**

Objectives

- ❖ **Evaluations of monetary and Environmental impacts of the r.l. 43/1974 forest constraint by means **Cesano Forest Estate case study**;**
- ❖ **Discuss the role of Forest Authority to achieve a forest policy sustainable.**

Items considered

- **The case study:**
 - a) r.l. 43/1974; b) Cesano Forest Estate;

- **The impact of the r.l. 43/1974 forest constraint on the Cesano Forest Estate on:**
 - a) monetary; c) environmental;

- **Final consideration**
 - a) Cesano Forest Estate; b) Sustainable forest policy

Law 43/1974

❖ R.l. 43/1974 included special **forest constraint** named “**forest with relevant vegetation interest**” (*law introduced before the Regional or National Protect Area Act was adopted – r.l. 29/1997*) .



❖ **Preservation and increase environmental functions in forest areas** were the objectives expected by Regional Administration;

❖ Any **forest intervention** has absolutely **been forbidden**, and the forest owner received an **indemnity** for income losses;

Law 43/1973

- ❖ It involves more **coppice** than high stand forest, and all the considered forest area is **Public or Common estates**;
- ❖ The majority of 38 sites **are actually included** within the **National or Regional Protect Area Schemes**, or **European Network Nature 2000**;
- ❖ **R.l. 43/1974 was repealed** with r.l. 39/2002. Today the Regional Administration have to manage its **“heritage”**.

Cesano Common Estate

Cesano Forest Estate (CFE)

Regione	Lazio (Italy)
Town	Rome
Location	North-east of Rome (ca. 15 km)
Forest estate:	61 hectares;
Specie	<i>quercus cerris</i> L. (majority) and <i>quercus pubescens</i> Willdenow.;
Forest	coppice;
Management	clear cut, leaving selected stands (60-80 stands/ha);
Rotation	14 years;
Organisation	4 sections, of different age;
Production	fuelwood;
Aims of management:	fuelwood for local people and for market;

Cesano Common Estate

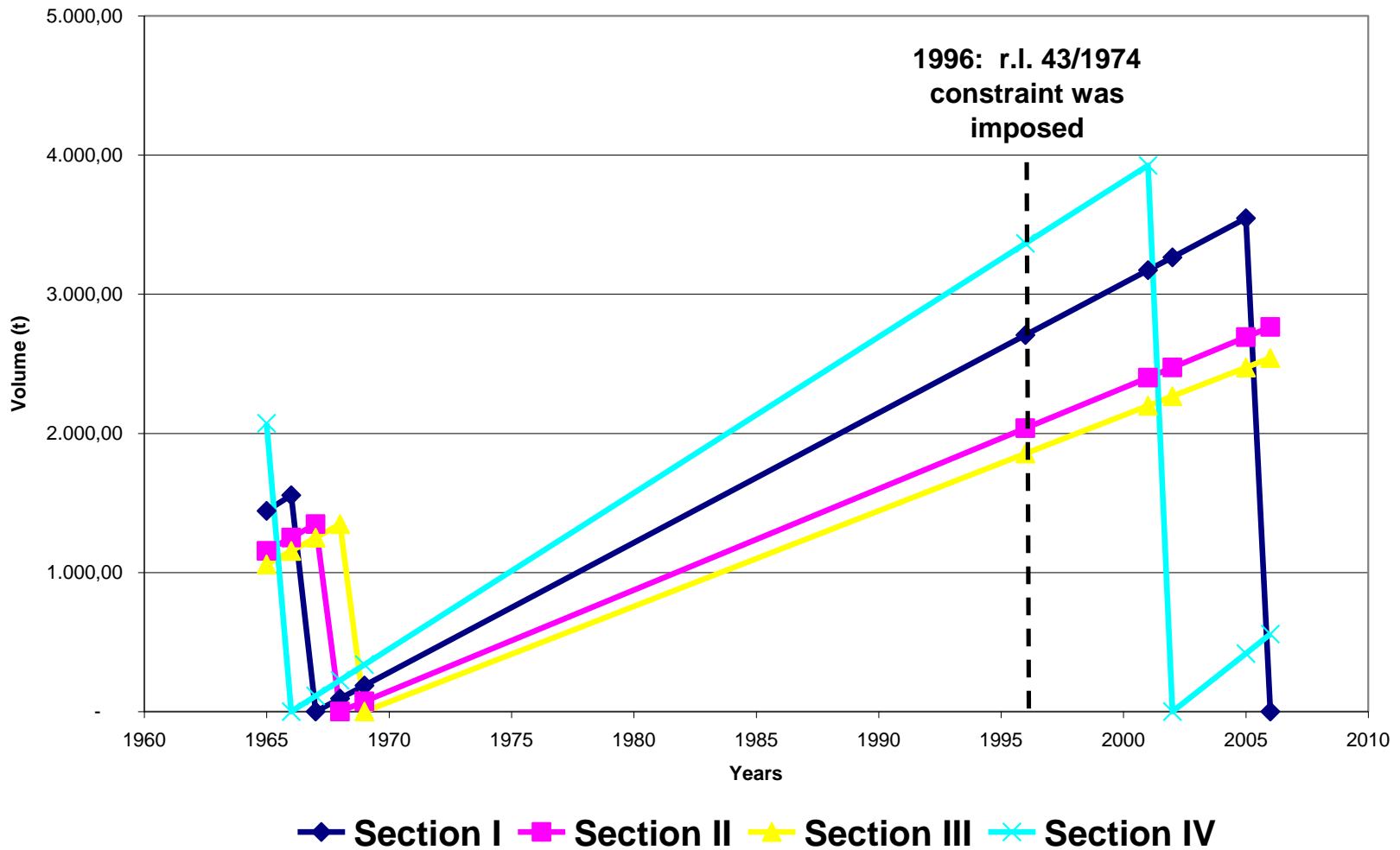
Cesano Forest Estate (CFE)

.... at 1996 ...

Forest area :	61 hectares;
Age:	18-21 years old;
Volume:	8.887,40 t
Forest indenmity:	€ 228.487,99

Cesano Common Estate

Cesano Forest Estate (CFE)



Cesano Common Estate

Cesano Forest Estate (CFE)

.... at 1996 ...

Forest area : 61 hectares;
Age: 18-21 years old;
Volume: 8.887,40 t
Forest indenmity: € 228.487,99

.... at 2000 ...

Forest area : 61 hectares;
Age: 23-26 years old;
Standing situation 60-70% of standing dead
Problems:
a) **Excess of biomass.**
b) **Primary and secondary pathogenic infestation, reinforced by unfavorable climate trends.**

Detail about Cesano forest at 2005



Cesano Common Estate

Cesano Forest Estate (CFE)

.... at 1996 ...

Forest area : 61 hectares;
Age: 18-21 years old;
Volume: 8.887,40 t
Forest indenmity: € 228.487,99

.... at 2000 ...

Forest area : 61 hectares;
Age: 23-26 years old;
Standing situation 60-70% of standing dead
Problems:
a) **Excess of biomass.**
b) **Primary and secondary pathogenic infestation, reinforced by unfavorable climate trends.**

.... at 2008 ...

Forest area : 61 hectares;
Age: 1-6 years old;
Management ad hoc interventions (10-20 stands/ha)
[emergency silvicultural interventions]

Items considered

- **The case study:**
 - a) r.l. 43/1974; b) Cesano Forest Estate;

- **The impact of the r.l. 43/1974 forest constraint on the Cesano Forest Estate on:**
 - a) monetary; c) environmental;

- **Final consideration**
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Materials and methods (1/4)

- **Part of data are collected by a multidisciplinary research supported by Lazio Regional Administration;**
- **Other data are collected from literature and, for environmental functions, by use of “*benefit transfer*” procedure;**
- ❖ **Where data are unavailable, the trend has been computed;**

Materials and methods (2/4)

The general model compares the two following hypothesis:

H0: present situation of CFE (*free, natural and spontaneous evolution of CFE*);

H1: potential management of forest (*forest managed according to the sustainable silvicultural criteria*);

Evaluation:

If: **H0>H1**

then **marketable and no marketable benefits** of present management scheme **have been increased**;

If: **H0<H1**

then **marketable and no marketable benefits** of present management scheme **have been reduced**.

Materials and methods (3/4)

Categories	Benefits	
Marketable	Wood, Hunting, Pastoral activities	“Proxy of” Total Economic Value
No- marketable	Recreation Biodiversity Carbon sequestration Soil protection	

Materials and methods (4/4)

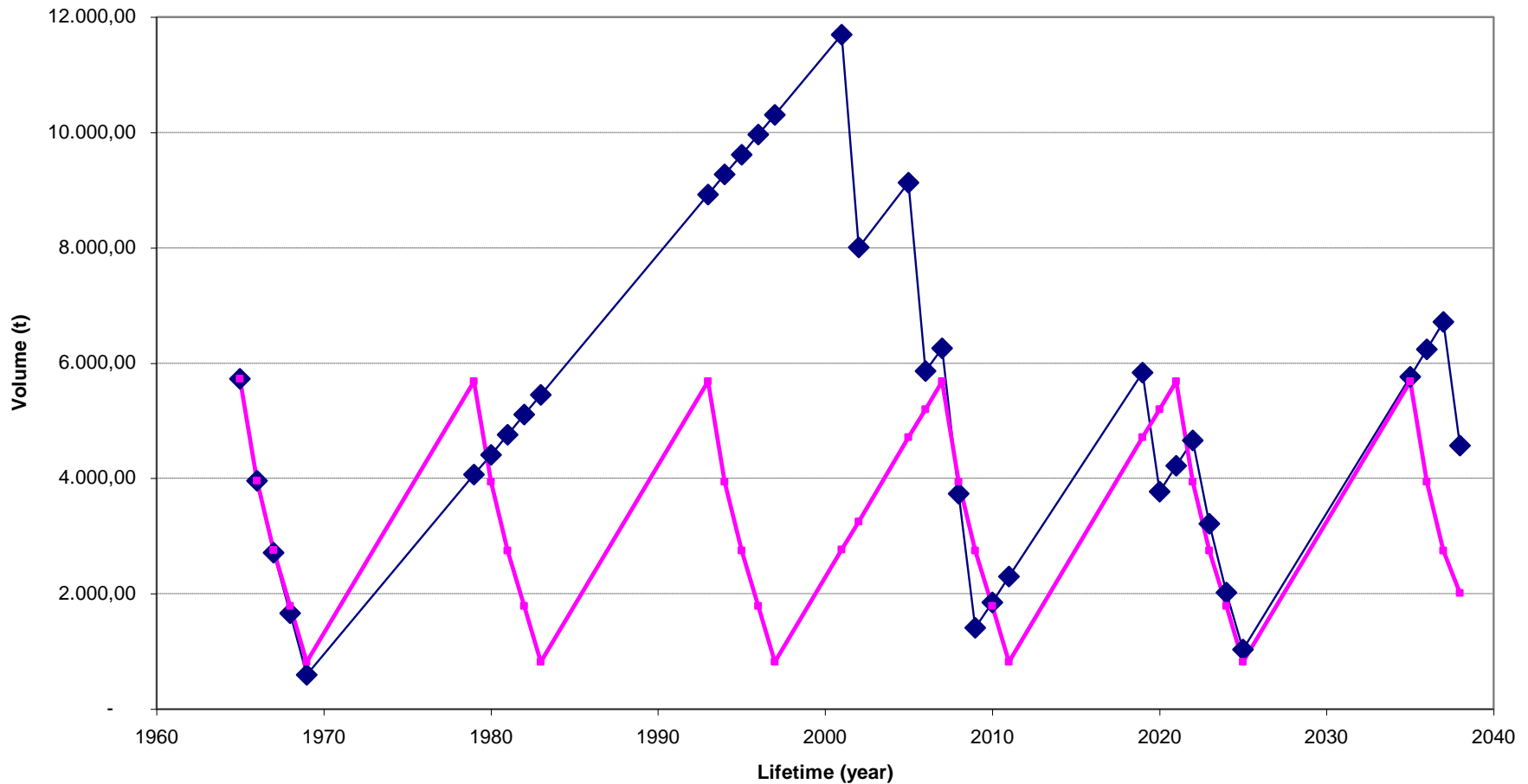
Marketable and no-marketable impacts have been evaluated for the following **period**:

❖ **1965**: year when the **last clear cutting** was implemented before the r.l. 43/1974 forest constraint;

❖ **2038**: year in which it is reasonable to assume that the **forest reaches the same structure that it had in 1965**, overcoming the transitional phase originated from emergency silvicultural interventions (2001, 2005, 2007 e 2008).

Evaluation of impacts on **marketable** benefits

Changes in wood production



- ◆ H0: forest with I.r. 43/1974 constraint forest
- ◆ H1: Sustainable management of forest

Change on wood production

Net wood production 1965-2038		Scenarios		H0-H1	of which	
		H0	H1		Good wood	Dead wood
Volume at 1965 (before the last cutting)	t	5.727,60	5.727,60	-	-	-
Net wood production 1966-2037	t	27.408,90	34.498,80	- 7.089,90	- 13.025,07	5.911,20
Volume at 2038 (before the previous cutting for the year)	t	4.565,80	2.012,80	2.553,00	2.460,65	153,18
Net wood production 1965-2038	t	26.247,10	30.784,00	- 4.536,90	- 10.564,42	6.064,38
Net wood yearly production	t/ha/year	5,89	6,91	- 1,02	- 2,37	1,36

Remark

If CFE was managed according to criteria of SFM, it would have been more productive.

Impact on wood production

(monetary evaluation)

Net timber production 1965-2008		Scenarios		H0-H1
		H0	H1	
Standing value at 1966 (just before cutting)	€	104.349,13	104.349,13	-
Production for period 1966-2007	€	535.970,60	775.754,45	-239.783,85
Standing value at 2008 (just before cutting)	€	99.228,79	135.161,09	- 35.932,30
Net production value (exclude forest indemnity)	€	530.850,26	806.566,41	-275.716,15
Forest indemnity	€	228.487,99		228.487,99
Standing value at 1996 (not marketable)	€	275.546,37		275.546,37
Net production value (included forest indemnity)	€	483.791,88	806.566,41	-322.774,53

Remark

R.L. 43/1974 reduces significantly wood production. At 2009 CFE registered a loss of 275.000 €. Considering forest indemnity and excluding standing value at 1996 (not any more marketable), the loss is even higher (323.000 €).

Forest indemnity is not able to recover the income loss.

Impact on **other marketable benefits** *(monetary evaluation)*

Pastoral activities:

In the past Cesano Forest Estate was used for horse breeding by local farmers. Today the few local farms still operative are interested to use CFE for their activities. The reduction of number, however, is due to socio-economic reasons and not to the imposition of the l.r. 43/1974.

Hunting:

in the past hunting activity was practiced in Cesano Forest Estate. Since the inclusion of the Cesano Forest Estate into Bracciano - Martignano Regional Park (1999), this activity has been forbidden.

Remark:

These two main activities developed in the CFE, have been dramatically reduced compared to the past. However, **both decrease is not attributable to the imposition of the l.r. 43/1974.**

Evaluation of impacts on
no-marketable benefits

Impact on recreation function (*environmental evaluation*)

Recreational activity is occasionally practiced in the CFE. It has involved families and the elderly, both coming from Rome, and it was mostly practiced in traditional holidays.

In recent years users have significantly reduced and their profile changed. Now are expert users and individuals who appreciated “forest-wilderness.”

Estimation of WTP for the two alternatives

	H0	H1	H0-H1
WTP	4,72 €/cad	6,74 €/cad	-2,02 €/cad

Remark

L.r. 43/1974 produces a reduction of recreational function. Its impacts both on the number of users and the single value. This **seems rather contradictory**, since the rationale for **non harvesting** is to restore suitable environmental conditions as many **citizens claim to appreciate**.

Impact on **biodiversity function** (*environmental evaluation*)

Parameters	Scenarios	
	H0	H1
a) modification of the inter-species genetic patrimony	Given the fact that it is a “quercus” coppice, the genetic patrimony of the specie keeps the same.	
b) Modification of the species diversity in the ecosystem		Richer ecosystem of saprophyte organisms guest by dead wood. Increase in number and diversity of soil micro-organism until the clear cutting, then they drops down .
c) Modification of the ecosystem	No variation, being a proper formation with vegetational potential of that area. .	

Remark

R.L. 43/1974. yielded an increase in the biodiversity of the ecosystem as saprophyte and soil organism. N.B: soil organism had a positive trend until the emergency silvicultural interventions have occurred, after decrease dramatically.

Impact on carbon sequestration function (environmental evaluation)

Hypothes H0

Year/Period	Living biomass		Dead organic matter		Soil	Total
	Above biomass	Below biomass	Dead wood	Litter		
1.965	4.861,01	948,49	118,56	-133,79	2.507,79	8.302,07
1965-2037	22.601,73	4.410,09	2.753,49	-683,87	11.228,95	40.310,39
2.038	3.874,99	756,10	94,51	- 99,05	2.052,13	6.678,68
Net Carbon sequestration	21.615,71	4.217,70	2.729,44	-649,13	10.773,29	38.687,01

Hypothes H1

1965	4.861,01	948,49	118,56	-133,79	2.507,79	8.302,07
1966-2037	29.279,13	5.713,00	714,13	-825,45	14.968,26	49.849,07
2038	1.708,26	333,32	41,66	- 22,72	1.050,84	3.111,38
Net Carbon sequestration	26.126,38	5.097,83	637,23	-714,38	13.511,32	44.658,38

Variation of Carbon captured (H0-H1)

1965	-	-	-	-	-	-
1966-2037	- 6.677,40	-1.302,91	2.039,36	141,58	- 3.739,31	- 9.538,67
2038	2.166,73	422,78	52,85	- 76,33	1.001,29	3.567,31

Remark

At the end of period 1965-2038 the carbon sequestration function has been reduced of 5.971,37 t. If the living biomass and soil reduced the amount of carbon captured, the dead wood increase its contribute. Forest constraint reduce the carbon sequestration function of CFE.

Impact on **soil protection** (*environment evaluation*)

	Difference	
	H0	H1
Soil erosion	Protection by the stands	Actualy no protection
Landslide	Same level of protection enhanced by the roots	

Remark

R.L. 43/1974 does not modify the leve of soil protection, since this level would be the same would have been achieved whenever periodically felling would occur. The r.l. 43/1974 does not determine a significant variation on this function

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Conclusion

About Cesano Forest Estate

Categories	Benefits	Period	Evaluation method	Value H0-H1	Trend
Marketable	Wood production	1965-2038	Net production	- 6.064,38 t -322.774,53 €	Decrease
	Hunting		Computed	-	Stable
	Silvopastoral		Computed	-	Stable
No-marketable	Recreation		Benefit transfer (CVM)	-2,02 €/visit	Decrease
	Biodiversity		Computed	???	Increase
	Carbon sequestration	1965-2038	Net carbon sequestration	-5.971,37 t	Decrease
	Soil protection		computed	-	Stable

Remark

Despite the **environmental vision of r.l. 43/1974**, **negative impacts** in the CFE are occurring;

Conclusion

About Cesano Forest Estate

- ❖ According to the hypothesis, **CFE is experiencing a relevant reduction of market products and environmental benefits** in the period 1965-2038;
- ❖ At present CFE and Regional Administration are managing the l.r. 43/1974 “heritage”, whose **impacts are delivered over very long time and are not easy to solve**;
- ❖ **Forest indemnity does not cover the fall in of market products.** Forest indemnity not include also the environmental functions decrease in CFE and the community are registering, and the future community will registered too.

Outlines on sustainable forest policy

The **use of r.l. 43/1974 mechanism, or others similar**, finalized to safeguard environmental value, nowadays ought to rely on:

- a) **permanent monitoring network** of forest ecosystems;
- b) a **more flexible legal** framework;
- c) the adoption of a **forestry policy** more in line with to the characters of the **relate forest patrimony**;

Outlines on sustainable forest policy

Considering **secondary forest ecosystems**, such as these in the Lazio Region and in Italy as a whole, **with fragile biological equilibria**, the safeguarding activity should **not only consider** the “**virtuosity**” of **environmental objectives**, but should take care also of the fact that **we are intervening** on a system which **evolves** following **its own natural laws**, independently by discussion taken;

Public Forest Authority must acquire awareness that achieving **sustainable forestry management depends** also, and often most of all, **on its co-ordination action/function**, overcoming the habit of considering the latter as only a specific problem of activities in the forest.

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This is all,

.... tank you for your
attention and patience!!!

Francesco Carbone

Department of *Ecology and Sustainable Economic Development* (DECOS)

University of Tuscia, Viterbo. Italy;

Largo dell'Università (building E), I 01100 Viterbo (Italy)

Tel. ++ 39 0761 357748;

Fax ++ 39 0761 357751

Email: fcarbone@unitus.it