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University of Minnesota
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Universita degli Studi di Padova
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SESSION II: LAND MARKETS IN THE U.S. AND E.U.

PAPER 3: THE EFFECTS OF LANDSCAPE PROTECTION ON REAL ESTATE VALUES: THE CASE OF THE COLLI EUGANEI REGIONAL PARK

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THE EFFECTS OF LANDSCAPE PROTECTION ON REAL ESTATE VALUES: THE CASE OF THE COLLI EUGANEI REGIONAL PARK

Tiziano Tempesta

1 Introduction

Many studies were carried out on the land market in Italy in the paste decades (Vanzetti, 1965; Ferro, 1968; Di Sandro, 1972; Panattoni, 1976; Grillenzoni, 1981). These studies pointed out that both economic and not economic factors played an important role in land prices definitions. On the other hand, a great number of economic subject, sometimes poorly related with farming, are involved in land market (Grillenzoni, Grittani, 1990).
Because of the peculiarity of real estate equilibrium the land market are usually far from perfect competition and they are probably closer to the monopolistic competition and, in some case, to the bilateral monopoly.
Moreover, in recent years the land assumed the characteristics of a "consumption good" and not only, as in the past, of a production input, since it can directly satisfies some groups of needs (typically for recreation and tourist purposes) (Di Sandro, 1972).
Some recent studies contributed greatly to this topic (Grillenzoni, Gallerani, 1973; Grillenzoni, Gallerani, 1977; Grillenzoni, 1990, Grillenzoni et al, 1993).
Finally, another interesting field of researches has been focused on the relationship between land values and environment and landscape. The analysis of real estate's prices can show the role that the environment plays in the market prices' equilibrium (Randall, 1987; Pearce, Markandya, 1989).
In this way it would be possible to estimate the social values of environmental quality.
Starting from this evolution in economic and appraisal theory a new interesting sector of studies was developed to analyse the relationship between environment politics (e.g., new park) and land values.

The setting up of a park is in general followed by the introduction of some restrictions in the use of the land.
These restrictions may cause a reduction of benefits from the resources' use. So a park may have quite strong impacts on real estate values.
Studying the land market' evolution interesting cues on the actual impact of a park on the real estate and, consequently, on the income of the park's employed (especially farmers) can be pointed out.
In order to verify such a problem, a research on the evolution of the land market has been carried out in an area inside and surrounding the Colli Euganei park (1). In this way it was possible to compare the land market before and after the park's set up and to formulate some hypotheses on the emerging elements of diversification.

2 Methodology

In Italy the sources of information on the land market are very poor. In the Veneto Region there are not any systematic gathering on the market's cues (prices, characteristics of the real estate on sale, contractors) (2). Even with this lack, to study the land market in the Colli Euganei, we investigated the contracts of sale of the real estate sent each month from the Registrar's Office to the Town Councils in order to calculate the INVIM tax. This source allowed to have detailed information on many aspects of the land

market such as: type of real estate on sale, physical characteristics, categories of contractors, etc.. However, in most cases the data on real estate's prices were unreliable (Fratepiero, 1990).
To know the real estates' prices I made a survey among five estate agencies working inside the study area. For this purpose we defined two standard real estate:
1) land sold without any buildings;
2) land sold with a building.
In the first case the average price of arable land, woodland and vineyard were surveyed in the 1982-1992 period.
In the second case, analysing the contracts of sale's data, two type of real estate were defined:
2.1) building of 600 cubic metres with 1500 squared metres of land;
2.2) building of 600 cubic metres with 1.5 hectares of land.
As far as real estate with buildings are concern only average values of 1982-1985, 1986-1988, 1989-1992 periods resulted from the estate agency .
These three periods were linked to the introduction of restrictions by the park:
1982-1985: no restrictive laws whatsoever;
1986-1988: the Regional Master Plan, which came into force in 1986, defined the temporary borderlines of the park and some provisional land use restriction (3);
1989-1992: four years following the specific regional law (38/1989) instituting the park.
To isolate the effect of the park institution on land market trends, the survey was carried out both inside and outside the protected area. The analysed area inside the park cover an agricultural and forest surface of 3484 hectares (24% of the protected area), while the external area includes 2315 hectares. About 1275 contracts of sale were taken into account.

3 The results

From 1982 to 1992 in the area inside the park 1200 rural estate changed landowner. In this way 1043 hectares were transferred on, corresponding to 3.23% yearly of the farm surface. About 66% of these property's changes was due to sale, similarly inside and outside the park.
The data analysis shows, first, that inside the park the mobility land index (4) increased from the 2.19% in 1982-1985 period to the 2.92% in 1986-1988 period, reaching the annual average of 4.32% after 1988. Secondly, this depend highly from the changes in the land purchased and sold.
About the traded land, the survey show that:
1) within the Colli Euganei, since the date of the designation of the territory to become a park, there is a raise in the land market mobility (Figure 1). This is particularly evident for the sales of real estate with buildings;
2) lands with rural buildings is a second element of strong diversification of the hilly land market with respect to the plain. Inside the park, about 45% of the land sales regarded buildings and cultivated areas. On the other hand, such a percentage was always below 30% in the plains;
3) during the '80s there was a strong transfer of real estate from non-resident to resident people. This trend favoured certain professional categories such as farmers. This process was

diversified inside and outside the park. Outside, the transferring of the real estate to the residents diminished during the observed period; the opposite happened inside the park. After the area was designated to become a park, the transfer of the real estate from non-residents to residents was emphasised.
With reference to the land values, the study shows a typical cyclical trend of land values. So land values in the Veneto Region increased in the second half of '70s, decreased in the first half of '80s and decreased again after 1986 (Rosato, 1991). This is because the land market trends are strongly influenced by the general trends of the whole economy.

Figure 1 Land sold incidence on farm's area in the park and in the plain. Percentage; 1982-92.

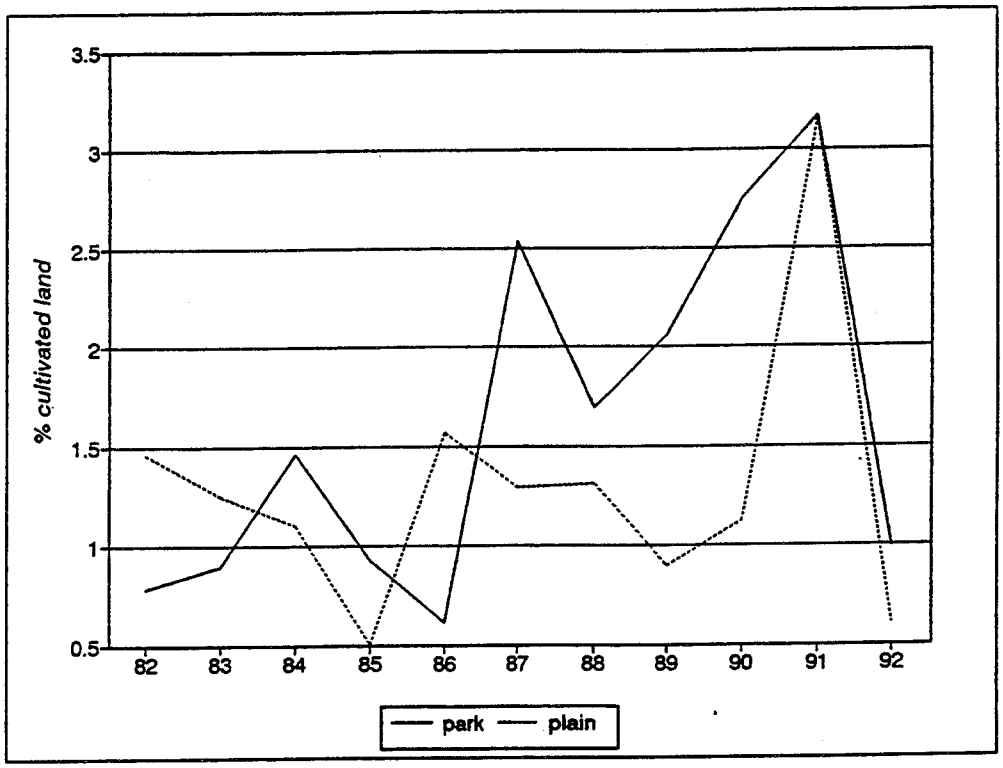

Table 1 Land sold inside and outside the park from 1982 to 1992.

park

	land only		land and buildings		total		%farmland
	ha	%	ha	%	ha	%	
82	13.25	57.81	9.67	42.19	22.92	100.00	0.78
83	11.01	42.02	15.19	57.98	26.20	100.00	0.89
84	25.10	58.56	17.76	41.44	42.86	100.00	1.46
85	19.44	71.68	7.68	28.32	27.12	100.00	0.92
86	6.28	34.85	11.74	65.15	18.02	100.00	0.61
87	41.88	56.14	32.72	43.86	74.60	100.00	2.54
88	20.85	41.94	28.86	58.06	49.71	100.00	1.69
89	40.17	66.46	20.27	33.54	60.44	100.00	2.06
90	46.84	58.02	33.89	41.98	80.73	100.00	2.75
91	60.05	64.58	32.94	35.42	92.99	100.00	3.17
92	16.28	56.08	12.75	43.92	29.03	100.00	0.99
total	301.15	57.40	223.47	42.60	524.62	100.00	17.86

Plain near the park

	land only		land and buildings		total		%farmland
	ha	%	ha	%	ha	%	
82	23.35	100.00	0.00	0.00	23.35	100.00	1.45
83	20.06	99.95	0.01	0.05	20.07	100.00	1.25
84	15.98	90.44	1.69	9.56	17.67	100.00	1.10
85	6.25	77.26	1.84	22.74	8.09	100.00	0.50
86	23.48	93.21	1.71	6.79	25.19	100.00	1.57
87	16.83	81.27	3.88	18.73	20.71	100.00	1.29
88	16.77	79.71	4.27	20.29	21.04	100.00	1.31
89	13.74	95.62	0.63	4.38	14.37	100.00	0.89
90	17.60	97.78	0.40	2.22	18.00	100.00	1.12
91	50.74	59.37	34.72	40.63	85.46	100.00	5.32
92	8.19	84.17	1.54	15.83	9.73	100.00	0.61
total	212.99	80.78	50.69	19.22	263.68	100.00	16.42

Table 2 Number of land market transactions inside and outside the park.

park

	land only		land and buildings		total	
	n.	%	n.	%	n.	%
82	26	66.67	13	33.33	39	100.00
83	25	53.19	22	46.81	47	100.00
84	23	53.49	20	46.51	43	100.00
85	33	64.71	18	35.29	51	100.00
86	13	32.50	27	67.50	40	100.00
87	34	56.67	26	43.33	60	100.00
88	33	57.89	24	42.11	57	100.00
89	26	56.52	20	43.48	46	100.00
90	49	56.98	37	43.02	86	100.00
91	53	50.96	51	49.04	104	100.00
92	24	48.98	25	51.02	49	100.00
total	339	54.50	283	45.50	622	100.00

Plain near the park

	land only		land and buildings		total	
	n.	%	n.	%	n.	%
82	8	100.00	0	0.00	8	100.00
83	9	75.00	3	25.00	12	100.00
84	11	64.71	6	35.29	17	100.00
85	10	71.43	4	28.57	14	100.00
86	14	73.68	5	26.32	19	100.00
87	16	76.19	5	23.81	21	100.00
88	14	70.00	6	30.00	20	100.00
89	15	83.33	3	16.67	18	100.00
90	12	80.00	3	20.00	15	100.00
91	14	56.00	11	44.00	25	100.00
92	6	46.15	7	53.85	13	100.00
total	129	70.88	53	29.12	182	100.00

Generally speaking, we can suppose that there are three main factors affecting land demand and supply:
a) search of investments able to preserve the capital from the inflation;
b) land farming demand;
c) land demand for housing and building purposes.
The examination of land values shows that the all three factors played an important role in land market trends in the studied area.
The deflated values of both arable land and vineyard decreased until 1986, increased from 1986 to 1990 and decreased again in the first '90s (Table 3, Figure 2, Figure 3).
Given this general trend, some important differences in crops, geographical area and good sold exists can be pointed out. Firstly we can see that land values trends are different inside and outside the park.
The average price of arable land in the hilly area was lower than in the plain outside the park in all the periods analysed, even though this difference increased during the time.
Regarding to the vineyards, the situation is different. First the price difference inside and outside is smaller. Moreover, the vineyard prices are higher in the hill. The land price trends probably were influenced by technology, market and E.U. policy changes in vineyard, cereals and soybean production. As far as the grape growing sector is concern the market and political changes determined higher prices of wine of some areas where high quality wine is produced. Since the second half of the '80s the E.U. imposed some restrictions in grape growing that favoured this trend.
In the cereals and soybean production the progressive price's reduction caused an income reduction especially in marginal hilly and mountainous areas where the per unit production is lower than in plain.
Inside the park probably also other factors than E.U. and market changes played a role in the prices decrease of arable land. It is noticeable that the arable land prices inside the park became lower than outside after the park designation of Colli Euganei.
The market trends of the land with buildings were very different from that of land without.
The value of the farmlands with buildings has always been much higher in the hills than on the plains (Table 4). The average value of a standard farmland of 1500 m^2 with a 600 m^3 building to be refurbished inside and outside the park resulted as follows:

	park (A)	Plain (B)	A-B
1982-85	80	34	46
1986-88	102	39	63
1989-92	115	44	71

(1989 millions of lire)

Figure 2 Average prices of the arable land in the park and in the plains; 1982-92 period.

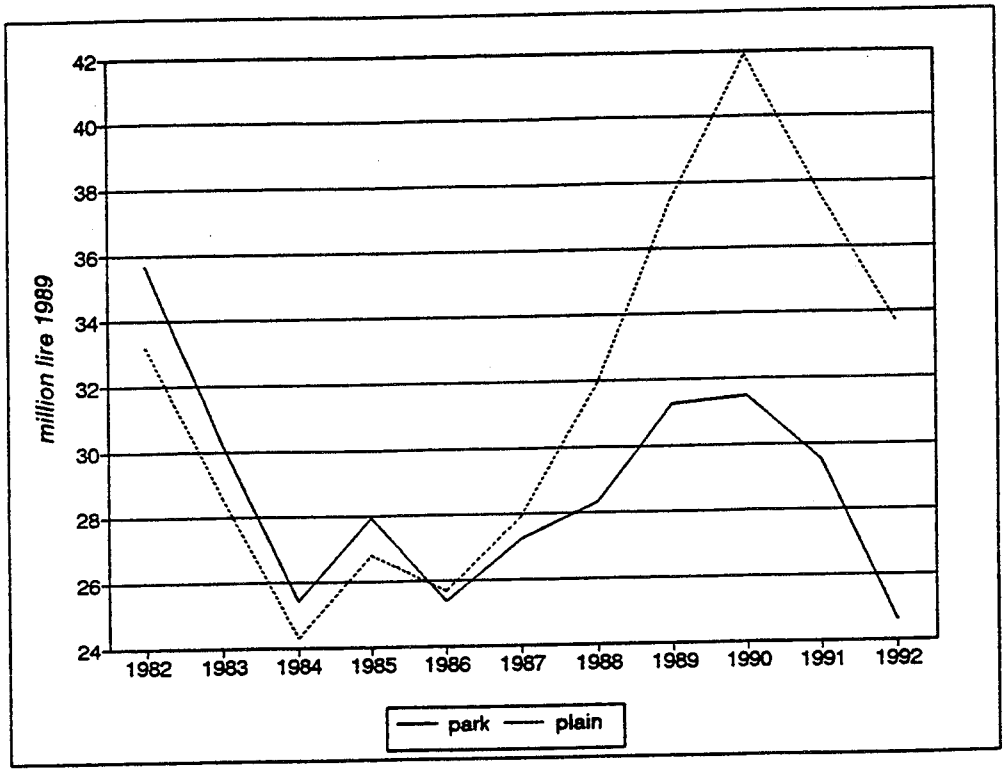

Figure 3 Average prices of the vineyards in the park and in the plains; 1982-92 period.

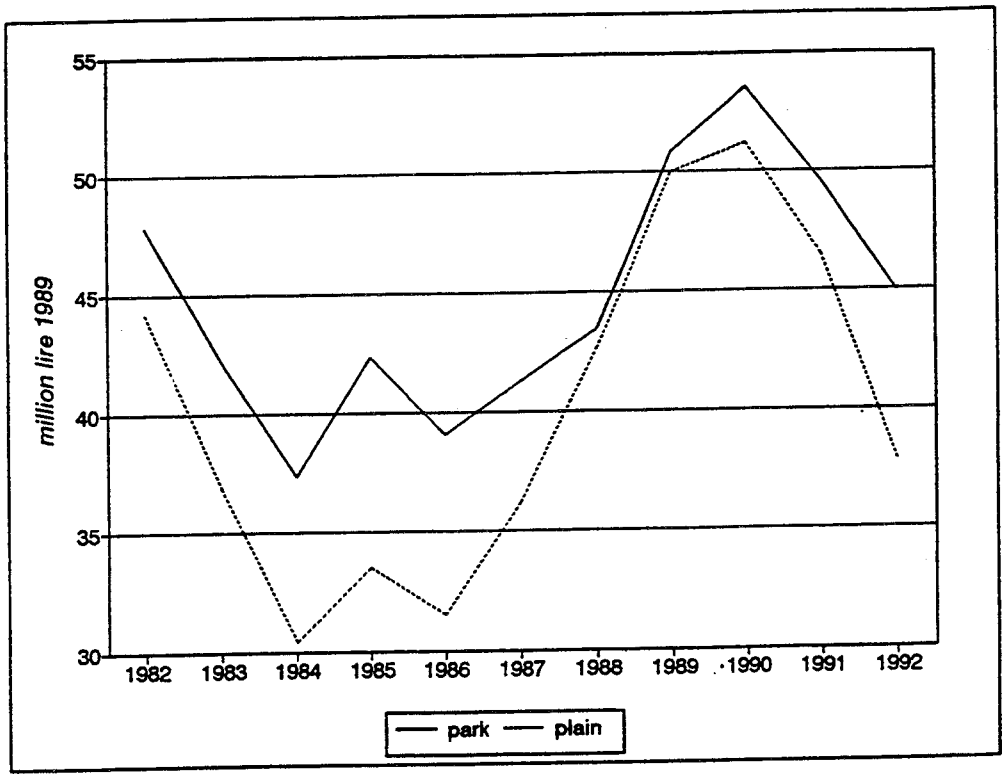

Table 3 Average price of the arable lands, vineyards and woodlands inside the Colli Euganei park and in the nearest plain (1989 prices).

	arable land Arquà P.	Cinto E.	Lozzo A. hill	park average A	Plain outside the park B	A-B
1982	53.5	31.4	22.1	35.7	33.2	2.5
1983	47.0	26.9	16.8	30.2	28.6	1.6
1984	41.1	22.9	12.2	25.4	24.3	1.1
1985	45.2	25.2	13.4	27.9	26.8	1.1
1986	40.0	22.9	13.2	25.4	25.7	-0.3
1987	41.8	24.5	15.4	27.2	27.9	-0.7
1988	43.1	24.5	17.3	28.3	31.9	-3.6
1989	47.5	27.5	18.8	31.3	37.5	-6.2
1990	46.6	26.8	21.0	31.5	41.9	-10.4
1991	44.3	26.6	17.7	29.5	37.6	-8.1
1992	35.8	23.2	14.8	24.6	33.7	-9.1

	vineyards Arquà P.	Cinto E.	Lozzo A. Hill	park average A	Plain . outside the park B	A-B
1982	58.9	58.9	25.8	47.9	44.2	3.7
1983	52.4	52.4	21.9	42.2	36.9	5.3
1984	46.9	46.9	18.3	37.4	30.4	7.0
1985	53.5	53.5	20.1	42.4	33.5	8.9
1986	48.0	49.2	20.0	39.1	31.5	7.6
1987	50.2	51.3	22.3	41.3	36.2	5.1
1988	50.5	53.2	26.6	43.4	42.6	0.8
1989	58.0	62.0	32.5	50.8	50.0	0.8
1990	60.6	65.2	34.9	53.6	51.2	2.4
1991	55.8	62.0	31.0	49.6	46.5	3.1
1992	52.3	57.3	25.3	45.0	37.9	7.1

	woodland Arquà P.
1982	9.3
1983	6.7
1984	6.1
1985	7.8
1986	8.0
1987	8.9
1988	10.6
1989	12.5
1990	14.0
1991	13.3
1992	11.2

Table 4 Average value of standard farmland with buildings (1989 lire. Millions).

Type 1: 600 m^3 building to be refurbished and 1500 m^2 of land

Periods	Arquà P.	Cinto E.	Lozzo A. hill	park average	Plain outside the park	D-E
				D	E	
82-85 (A)	94	67	80	80	34	46
86-88 (B)	122	84	100	102	39	63
89-92 (C)	141	97	106	115	44	71
B/A *100	29.8	25.4	25.0	27.0	14.7	
C/B *100	15.6	15.5	6.0	12.4	12.8	
C/A *100	50.0	44.8	32.5	42.7	29.4	

Type 2: 600 m^3 building to be refurbished and 10000 m^2 of land

Periods	Arquà P.	Cinto E.	Lozzo A . hill	Average park	Plain outside the park	D-E
				(D)	(E)	
82-85 (A)	121	94	107	107	54	107
86-88 (B)	156	111	134	134	67	110
89-92 (C)	177	133	133	148	62	128
B/A *100	28.9	18.1	25.2	24.5	24.1	
C/B *100	13.5	19.8	-0.7	10.5	-7.5	
C/A *100	46.3	41.5	24.3	37.6	14.8	

The value of buildings is higher inside the park and it is also increased very much with time. The large variation inside the park before and after the designation and the further increases during the 1989-1992 period should be noticed. Such a fact did not happen in the plains area.
A final consideration should be drawn regarding the variations in value of real estate in the different periods:

	arable land value		vineyard value		land value of 1500 m^2 with build.	
	park	plain	park	plain	park	plain
% variation 1982-85/1986-88	-10.6	-2.2	-2.2	-3.3	+27.0	+14.7
% variation 1986-88/1989-92	+7.4	+34.2	+19.8	+29.1	+12.4	+12.8

From this, it can deduce that, while the lands without buildings registered stronger decreases in prices inside the park than outside the area, the rural buildings instead were much more appreciated, and this proves an asymmetrical effect of the institution of the park on the land market values.

4 Park institution and land market: some hypothesis

Prices and annual sold land (namely the market equilibrium points) permit a better understanding of the different trends inside and outside the park.
Regarding the land without buildings inside the park after 1987 there was an increase of traded areas but the prices were substantially flat.
On the contrary, there was a largest prices increase while the land marketed was stable in the plain near the Colli Euganei.
That is probably due to the different changes in demand and supply function in the two areas. An enlargement of both supplied and demanded land without buildings within the park and only demand increase in plain can be supposed.
The institution of the park induced some owner's groups to sell the land mainly because of the fear of restrictions imposed to the building activity. Mainly the owners not living inside the park caused the increase in land mobility in the late '80s. They had purchased the land for building purposes that they were little interested in farming. In this period, the demand's increase shows that the farmers had not pessimistic expectations on the possible effects of the park institution on the farming and cattle rearing income. Farmers, both in the plain and in the park, purchased a large part of sold land. The demand expansion inside the park was probably due to the good price trend of the high quality wine.
Also with reference to the marketing of land with buildings a difference inside and outside the park was observed.
The analysis of the average prices and of the marketed land suggest that the market changes was due to a great demand expansion in presence of a steadiness of the supply both inside and outside the park. In the hilly areas, as seen above, the

prices increase was larger than in the plain. That suggests that the demand increase was probably higher in the hilly area. In the park there was an overvaluation of the land with buildings, probably due to the reduction of the building suitability of cultivated land introduced by the park.
In order to give an insight of the whole effect of the prices changes described above, an appraisal of the real estate value of cultivated land in the Colli Euganei regional park in '80s was made (Table 5).
The data of Table 5 show that the real estate value increased, at 1989 constant prices, from about 400 billions lire of 1982-85 period, to 598 billions lire of 1989-92 (+32%). The buildings are the most important part of rural real estate value; its incidence on total value increased from 56% in 1982-85 period to 63% in 1989-92. In the same period also the values of vineyards and woodlands increased, while, on the contrary, arable land and grassland value decreased.

5 Conclusions

The study has evidenced that the institution of a park could influence the land market in different ways. Generally speaking, the environmental constraints can cause both increase and decrease in real estate value. Environmental constraints, real or expected, do not determine a real estate loss to the owners, but they have a distributive effect among different owner's groups.
In this direction, the analysis of the land market trends is an interesting tool to investigate the park institution impact on the local economy and on particular land owner's groups.
The Colli Euganei regional park study, although referred to the first period of activity of the park, shows that the park did not cause a generalised decreased of real estate. Even though it is difficult to state that the park determined all the changes in land market showed, the protected area could have promoted an increase in buildings' rural value higher than the decrease due to the loss of land building suitability. Moreover table 5 shows that inside the park the tourist and recreational land use and some farming activities strictly connected with recreational activities like the wine production and selling had more and more importance during the '80s. It could be stated that in the Colli Euganei area some changes in land use occurred endowing the tourist and recreational attitude of the area. That phenomena favoured a real estate value increase, especially with reference to the land owner living inside the park and the farmers.
Finally, while in the studied area the park institution caused prevailingly positive effects, negative effects could be prevailing in other territorial and social contests. In this ways it can not be concluded that the effect of a park institution would ever be the increase of the real estate value. Only a detailed analysis in each geographical, environmental and agricultural contest could states if positive real estate effects are prevailing on negative ones.

Table 5 Real estate value in the park of Colli Euganei in 1982, 1986 and 1991 (1989 millions lire).

1982

	surf. ha	price millions	value millions	%
arable land	3252	30.4	98871	13.9
vineyard	3498	42.5	148651	20.9
grassland	651	21.4	13932	2.0
woodland	5322	7.4	39384	5.5
uncultivated	1101	8.7	9576	1.3
total surface	13824		310413	43.7
buildings.	5000	80.0	400000	56.3
total value			710413	100.0

1986

	surf. ha	price millions	value millions	%
arable land	3082	27.2	83841	10.7
vineyard	3454	31.9	110191	14.0
grassland	610	20.3	12377	1.6
woodland	5362	8.8	47182	6.0
uncultivated	1108	8.2	9089	1.2
total surface	13616		262679	33.5
buildings.	5120	102.0	522240	66.5
total value			784919	100.0

1991

	surf. ha	price millions	value millions	%
arable land	2870	29.2	83804	8.9
vineyard	3400	49.7	168980	17.9
grassland	558	22.3	12460	1.3
woodland	5411	12.8	69261	7.3
uncultivated	1118	10.1	11292	1.2
total surface	13357		345797	36.6
buildings.	5200	115.0	598000	63.4
total value			943797	100.0

Notes

(1) The Colli Euganei are a hilly area sited at the middle of the Veneto plain, near the city of Padua. The territory of Colli Euganei is densely populated and farming is one of the most important economic activities. The park is about 13000 hectares of which:
- 3428 hectares of arable land;
- 3400 hectares of vineyard;
- 5400 hectares of woodland.
The territory has a very interesting landscape especially with regard to the naturalistic, historical and cultural aspects.
Because of the closeness to Padua and to the densely populated Veneto plain Colli Euganei are intensively used for recreational and tourist purposes. A great number of tourist houses was also built especially during the '60s and the '70s (Tempesta, 1994).

(2) The only exception is the Emilia Romagna Region where since twenty five years ago the land market prices data information system exists (Grillenzoni, 1970; Grillenzoni, Bazzani, 1988).

(3) By the adoption of the first regional master plan (1986) the Veneto Region defined the areas where regional parks and natural reserves should be realised.

(4) The mobility land index (LMI) was calculated as follows:
$LMI = A_t/SAT * 100$
where:
A_t = land which changed landowner in t year
SAT = total agricultural and forestry surface in studied area.

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