

Benefits and costs of tourism and outdoor recreation in the Natural Park of the Ampezzo Dolomites (Veneto-Italy)

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1 Introduction

The Italian legislation on protected areas gives great importance to the positive effects which the setting up of a park has on the local economy. The Alps Agreement too, with particular regard to Tourism Protocol has underlined that tourism development has to be sustainable. Therefore, we need to know tourism and outdoor recreation benefits and costs. This is particularly important in the protected areas in the mountains, where ecosystems are fragile and tourism impact may be very dangerous. Nowadays, there is a great lack of information on costs and benefits connected to the recreational use of natural areas (Tempesta and Thiene, 2000). We generally do not know the number of visitors, their expenses and activities, the sites visited and so on.

The aim of the paper is firstly to define a conceptual frame referring to the Alps, in order to determine the data that allow to estimate benefits and costs. Next, results of the analysis carried out on the Natural Park of the Ampezzo Dolomites during summer 1999 will be illustrated. The paper contains, however, only the most relevant costs and benefits in the study area.

2 Benefits and costs of mountain tourism.

Tourism and outdoor recreation produce both positive and negative effects on the economy and the mountain territory that can be summarised as follow:

Benefits

- Benefits on the local economy (due to tourists expenses in the area)
- Benefits on the national economy (purchase of equipment and materials)
- Benefits for the visitors (recreational benefits)
- Benefits for the whole society (education and culture)

Costs

- Environmental costs (damage caused by tourists, facilities and infrastructures)
- Costs on local economy (unbalanced economic development)
- Costs on local society (loss of cultural identity)
- Non-market visitor costs (congestion, accidents)
- Public expenditure (path and road maintenance, oversight, public services, etc.)

In order to manage the mountain system, it is necessary to have systematic information on land for the detailed list of items. Benefits and costs have to related to:

- numbers of visitors;
- socio-economic characteristics;
- activities and motivations;
- environmental sensitivity of the visited area;
- the period involved (summer and winter).

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As regard accommodation, visitors have to be differentiated between daily visitors and tourists. Among tourists, we consider the following types of accommodation: second house; youth hostel, campsite and alpine huts; hotel and boarding house; lodging house.

Considering the socio-economic features, the age, the educational level; the income, the place of origin, etc. area particularly relevant.

Among the summer activities, can be considered: hiking in the woods at low height, picnicking, trekking, climbing, and mountaineering. Finally, it is very important to analyse the sensitivity of the different areas referring to the impact of the above activities.

3. The survey.

The Natural Park of the Ampezzo Dolomites was established on 22 March 1990 by Act number 21 of the Veneto Region and spreads out over an area of 11.000 hectares to the north of Cortina d'Ampezzo inside one of the most important tourist basins of the Alps, in the heart of the Eastern Dolomites. The Park encompasses the ancient property jointly owned by the "Regole d'Ampezzo", a vast area of woodland and grassland comprised within the boundaries of the local Municipality. The "Regole", or Family Mountain Communities, are age-old land managing bodies made up of the native families of the early settlers for the joint use and administration of pastures and forests. Created with the agreement of the General Board of the "Regolieri" (members of the Regole), the Park was entrusted by the Veneto Region to the managing competence of the Regole d'Ampezzo "... in accordance with the ancient rules laid down for the management of Ampezzo natural heritage, preserved and defended over hundreds of years"¹.

In order to frame the recreational demand two surveys have been carried out:

1. evaluation of the number of visitors;
2. analysis of the visitors' characteristics, expenditures and the relationship with the sites visited.

The estimation of the visitors has been realised as follows:

- a. identification of the main parking areas;
- b. computation of the cars in the parking areas during 42 days
- c. estimation of a cumulated distribution of frequencies of the arrivals in the parks through in-person interviews
- d. calculation of the total number of visitors of the protected area using the above information.

Therefore, 540.000 visitors have been estimated. As it can be observed in table 1 about 65% of them are concentrated in July and August. The Natural Park of the Ampezzo Dolomites is one of the most visited of the Alps (tab.2) and has a number of visitors per hectare per year greater than 40.

Table 1 Visitors of the Natural the of Ampezzo Dolomites.

Month	Visitors	%
May	30.657	5.7
June	27.372	5.1
July	119.575	22.1
August	232.992	43.1
September	95.464	17.7
October	33.940	6.3
Total	540.000	100.0

¹ For more detailed information see www.dolomitiparco.com

Table 2 Visitors in some Italian alpine parks.

Parks	Surface (ha)	Visitors	Visitors per ha
Gran Paradiso	72.328	1.700.000	23,50
Val Grande	11.733	15.000	1,28
Stelvio - Lombardia	60.176	27.609	0,46
Stelvio - Trentino	20.300	200.000	9,85
Dolomiti Bellunesi	31.512	120.000	3,81
Alpi Marittime	28.000	400.000	14,29
Alpe di Veglia e Devero	10.791	15.000	1,39
Monte Avic	3.500	25.213	7,20
Monte Barro	665	15.000	22,56
Dolomiti di Sesto	11.635	251.000	21,57
Dolomiti d'Ampezzo	11.200	540.000	48,21
Dolomiti Friulane	36.950	300.000	8,12

Source: Chodziaener-Bonne, Wiederwald 2000

Therefore, the management of this protected area is certainly more complex than in the other parks. Two different questionnaires were collected:

- the first, more detailed, was surveyed through in-person interview in the parking areas (500 interviews);
- the second, with general information, was self filled in the main alpine huts and picnicking areas (1.000 questionnaires).

The reason for the two questionnaires is due to the difficulty of reaching people visiting the highest parts of the territory in order to have more detailed information about them. They are, in fact, visitors of the most fragile areas and it was important to know the paths they followed. The in-person questionnaire includes:

- socio-economic characteristics;
- recreational behaviour (activities, visited areas, mobility);
- accommodation;
- congestion perception;
- expenditure.

4 The visitors

4.1 Accommodation

In 1999 daily visitors counted to 26% while 84% were people on vacation (table 3). Therefore the presence of daily visitors is considerable also in one of the most famous holiday areas of the Alps. Table 4 shows the distribution of visitors among different types of accommodation. The average length of stay strongly varies depending on accommodation. The longest stay is referred to the house owners and tourists in lodging house (about 19 days). People lodged about 5 days in the alpine huts. It is clear that alpine huts become an alternative accommodation to the traditional ones and not only a mere destination of a trip.

The importance of daily visitors is shown in tab.4, since last year they made an average of 10 trips in the park, that means 5 time more than people lodging in hotels.

A large number of visitors (38%) comes from the places around the protected area (table 5), travelling less than 10 km. This figure varies depending on the lodging; 54% of daily visitors travel more than 100 km. Moreover, there is a relevant group of people coming from the nearby valleys.

Therefore, the economic impact of the landscape resources of the park is quite extended concerning an area much wider than the real territory of the park.

Motivations of the excursion have been explored in the questionnaire. About one fifth declared a prevailing sporting interest (climbing and mountaineering); another large group went for trekking, that is a more relaxing activity. From the cultural point of view, only 9.3% was interested in having a contact with nature and 8.1% revealed a historical interest. Also reasons seem to be connected to lodging; in fact cultural and environmental interest prevail among people staying in hotels, lodging house and boarding house (table 6).

Table 3 Visitors in the park and accommodation.

	Visits		Visitors	
	n.	%	n.	%
Daily visitors	144.789	26,8	17.817	15,1
Hotel	72.747	13,5	22.683	19,3
Boarding house	45.647	8,4	14.326	12,2
Lodging house	126.430	23,4	28.611	24,3
Farm holidays	10.590	2,0	3.075	2,6
Holiday house	85.776	15,9	15.636	13,3
Alpine hut	14.159	2,6	4.141	3,5
Other	40.068	7,4	11.403	9,7
Total	540.205	100,0	117.690	100,0

Table 4 Length of stay and number of visits in the park in relation to accommodation.

	Holidays (mean)	Excursions (mean)
Daily visitors	0,0	10,2
Hotel	11,5	1,7
Boarding house	11,5	1,7
Lodging house	19,1	2,2
Farm holidays	15,5	2,1
Holiday house	19,2	3,4
Alpine hut	5,0	2,5
Other	9,4	1,0
Total	14,9	4,0

Table 5 Interviewees for distance covered in relation to accommodation.

	Classes of kilometres							Total
	<= 10	10 - 20	20 - 30	30 - 50	50 - 100	100 - 150	> 150	
Daily visitors	23	2	1	9	16	38	22	111
Hotel	38	11	14	8	1			72
Boarding house	8	10	15	10	3			46
Lodging house	40	24	21	9	6			100
Farm holidays	42	7	4	5	1			59
Holiday house	42	18	15	12	4			91
Alpine hut					2	2	10	14
Other			2		1		8	11
Total	193	72	72	53	34	40	40	504

Follows table 5

	<= 10	10 - 20	20 - 30	30 - 50	50 - 100	100 - 150	> 150	Total
Daily visitors	20,7	1,8	0,9	8,1	14,4	34,2	19,8	100,0
Hotel	52,8	15,3	19,4	11,1	1,4	0,0	0,0	100,0
Boarding house	17,4	21,7	32,6	21,7	6,5	0,0	0,0	100,0
Lodging house	40,0	24,0	21,0	9,0	6,0	0,0	0,0	100,0
Farm holidays	71,2	11,9	6,8	8,5	1,7	0,0	0,0	100,0
Holiday house	46,2	19,8	16,5	13,2	4,4	0,0	0,0	100,0
Alpine hut	0,0	0,0	0,0	0,0	14,3	14,3	71,4	100,0
Other	0,0	0,0	18,2	0,0	9,1	0,0	72,7	100,0
Total	38,3	14,3	14,3	10,5	6,7	7,9	7,9	100,0

Table 6 Motivations of excursion in relation to accommodation.

Motivation	Lodging facilities								Total
	Daily visitors	Hotels	Boarding house	Lodging house	Campsite	Holiday house	Alpine hut	Others	
Nature	3	10	4	14	3	12		1	47
Walking	1	9	3	13	2	13		2	43
Picnicking		1	2	7	1	4			15
MTB	3	1		2	5	8			19
Hiking	39	23	17	40	19	34	10	4	186
Landscape	25	24	18	35	9	24	2	4	141
War	6	5	9	9	6	3	2	1	41
Via ferratas	33	13	5	11	17	6	3	2	90
Climbing	9				2	4	2		17
Total	111	72	46	100	59	91	14	11	504

	Daily visitors	Hotels	Boarding house	Lodging house	Campsite	Holiday house	Alpine hut	Others	Total
Nature	2,7	13,9	8,7	14,0	5,1	13,2	0,0	9,1	9,3
Walking	0,9	12,5	6,5	13,0	3,4	14,3	0,0	18,2	8,5
Picnicking	0,0	1,4	4,3	7,0	1,7	4,4	0,0	0,0	3,0
MTB	2,7	1,4	0,0	2,0	8,5	8,8	0,0	0,0	3,8
Hiking	35,1	31,9	37,0	40,0	32,2	37,4	71,4	36,4	36,9
Landscape	22,5	33,3	39,1	35,0	15,3	26,4	14,3	36,4	28,0
War	5,4	6,9	19,6	9,0	10,2	3,3	14,3	9,1	8,1
Via ferratas	29,7	18,1	10,9	11,0	28,8	6,6	21,4	18,2	17,9
Climbing	8,1	0,0	0,0	0,0	3,4	4,4	14,3	0,0	3,4
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

4.2 Activities.

Inside the park it is possible to practise the entire number of activities that can be done during the summer in the Alps (table 7). Despite this, half of the interviewed declared their preference for hiking. Nevertheless, almost 27% goes through via ferratas and another 7% prefers the climbing routes, that is about 37.000 people climbing. This means that as to mountaineering activities the phenomenon of congestion occurs quite often, especially in July and August. The increasing number of accidents occurring every year in the park also points this out: on average in the last fifteen years 314 accidents, occurred with 28 deaths and 179 injured.

People staying in hotels, boarding and lodging houses and private houses preferably chose easy excursions along the paths (table 7). Climbing and mountaineering are more common among daily visitors and people lodging in alpine huts. By analysing the age in relation to activities (table 8), it can be observed that the older seem to prefer hiking and the younger, on the other hand, show a

clear preference towards harder activities. Nevertheless, there is a small group of strong experienced visitors, who are more than 50 years old, who can cope with climbing routes.

Table 7 Visitors in relation to accommodation and activities.

	Other activities	Hiking		Mountaineering				Total
		Paths	Alta vias	Vie attrezzate*	Via ferratas	Vie normali**	Climbing route	
Daily visitors	3	47	1	21	19	11	9	111
Hotel	16	35	1	15	3	2		72
Boarding house	10	22	1	6	6	1		46
Lodging house	9	67	4	13	7			100
Farm holidays	1	30	1	19	5	1	2	59
Holiday house	11	63		10	1	2	4	91
Alpine hut		4	3		4	1	2	14
Other	3	2	2	2	2			11
Total	53	270	13	86	47	18	17	504

	Other activities	Hiking		Mountaineering				Total
		Paths	Alta vias	Vie attrezzate*	Via ferratas	Vie normali**	Climbing route	
Daily visitors	2,7	42,3	0,9	18,9	17,1	9,9	8,1	100,0
Hotel	22,2	48,6	1,4	20,8	4,2	2,8	0,0	100,0
Boarding house	21,7	47,8	2,2	13,0	13,0	2,2	0,0	100,0
Lodging house	9,0	67,0	4,0	13,0	7,0	0,0	0,0	100,0
Farm holidays	1,7	50,8	1,7	32,2	8,5	1,7	3,4	100,0
Holiday house	12,1	69,2	0,0	11,0	1,1	2,2	4,4	100,0
Alpine hut	0,0	28,6	21,4	0,0	28,6	7,1	14,3	100,0
Other	27,3	18,2	18,2	18,2	18,2	0,0	0,0	100,0
Total	10,5	53,6	2,6	17,1	9,3	3,6	3,4	100,0

* vie attrezzate = easy via ferratas

** vie normali = the easiest paths or climbing routes to reach the peak

Table 8 Interviewees for activities and age.

Classes age	Other activities	Hiking		Mountaineering				Total
		Paths	Alta via	Vie attrezzate	Via ferratas	Vie normali	Climbing route	
30 – 39	6	43	5	23	11	6	4	98
40 – 49	22	82	1	32	15	4	10	166
50 – 59	8	69	5	16	14	5	1	118
Total	10	38	2	10	4	3	2	69
	7	38		5	3			53
Total	53	270	13	86	47	18	17	504

Classes age	Other activities	Hiking		Mountaineering				Total
		Paths	Alta via	Vie attrezzate	Via ferratas	Vie normali	Climbing route	
Under 30	6,1	43,9	5,1	23,5	11,2	6,1	4,1	100,0
30 - 39	13,3	49,4	0,6	19,3	9,0	2,4	6,0	100,0
40 - 49	6,8	58,5	4,2	13,6	11,9	4,2	0,8	100,0
50 - 59	14,5	55,1	2,9	14,5	5,8	4,3	2,9	100,0
Over 60	13,2	71,7	0,0	9,4	5,7	0,0	0,0	100,0
Total	10,5	53,6	2,6	17,1	9,3	3,6	3,4	100,0

4.3 Sites visited.

Great attention has been paid to the analysis of the sites visited by tourists. As far as huts are concerned (table 9), the greatest number of people was estimated at Lagazuoi, with over 100.000 visitors. This figure is partly due the presence of a cable car that makes the access to high mountains easier. In some areas this kind of facility can cause a strong impact on the ecosystem. Yet, the most visited area inside the protected area is the Fanes-Sennes plateau, where there were over 330.000 people. The massif of the Tofane is still a very attractive site with over 200.000 visitors, among which 5.000 people reached the Alpine bivouac located at 3.000 m above sea level. The study of the environmental and cultural characteristics of the sites (table 10), have pointed out two different demands: the environmental and the historical one. The environmental interest is highlighted by a huge tourist flow to the Fanes Waterfalls (39.000), Alpe (mountain summer pasture) de Sotecordes and Lerosa (20.000), Padeon Valley (13.000). Despite, the historical demand is related to the presence of over 58.000 visitors to a single site, that is the Castelletto Gallery. This is a gallery built during the First World War for military strategic purposes as it was for the long trench dug out in the whole area.

Some via ferratas, the Lagazuoi Gallery, Lipella and Tommaselli (table 11), were covered by more than 20.000 people. This charge could bring to dangerous situations, because it increases the possibility of accident. The above frame is much riskier if we take into consideration the climbing routes (table 12), where in some mountain faces as Lagazuoi Piccolo and Col dei Bos (which are not even the widest ones) we estimated over 12.000 climbers. The interviewees stated on average they met more 20 climbers along the climbing route they were covering (table 13).

Tab.9 Alpine huts visited.

Alpine huts	Visitors
Lagazuoi	108.014
Giussani	94.871
Dibona	77.389
Pomedes	20.234
Fanes	41.880
La Varella	26.639
Fodara	53.268
Biella	63.969
Sennes	82.376
Ra Stua	70.913
Son Forca	32.352
Lorenzi	42.476
Cima Banche	2.146
M. Travenanzes	8.010
Biv.della pace	4.650
Biv. Buffa Perr.	9.500
Biv. Alpini	4.910

Tab.10 Sites particularly important from a historical, environmental point of view visited.

Sites	Visitors
Lagazuoi	116.064
Galleria Castelletto	58.963
Col dei bos	42.850
Cascate Fanes	39.921
Val Travenanzes	39.881
Alpe Lagazuoi	25.272
Alpe e laghi Fosses	15.092
Pian de Loa	13.609
Val Padeon	13.438
Sass di Stria	13.174
Alpe Lerosa	12.544
Alpe Sotecordes	8.491
Cianderou	7.931
Antruiles	5.987
Pengia Paolina	5.115
Posporcorà	4.855
Son pouses	3.201
Pian de ra Spines	2.885
Masarè	1.758
Forcella Mortaio Casale	1.318
Zuoghe	545

Tab.11 Via ferratas made by visitors.

Via ferratas	Visitors
Ferrate Gallerie Lagazuoi	31.056
Lipella	28.974
Tomaselli	21.682
Llivieri	12.616
Bianchi	11.156
Punta Anna	9.613
Tofana III	7.328
De pol	2.339
Col Rosà	659
Strobel	0

Tab.12 Climbing routes made by visitors.

Climbing routes	Visitors
Lagazuoi Piccolo	19.947
Col dei Bos	12.830
Punta Fiames	6.379
Sas di Stria	5.397
Sud Tofana di Rozes	5.274
Torri di Falzarego	4.398
Lagazuoi Grande	4.192
Croda del Becco	2.366
Cima Scottoni	1.099
Croda Rossa	732
Croda da lago	659
Cristallo	659
Spalti col Bechei	565

Tab.13 Activities and people met by visitors.

Activities	Persons met
Other activities	31
Pathsi	57
Alta vias	83
Vie attrezzate*	57
Via ferratas	33
Vie normali**	46
Climbing routes	21
Total	53

* vie attrezzate = easy via ferratas

** vie normali = the easiest paths or climbing routes to reach the peak

5 The expenditure.

In the questionnaire were collected some information related to the expenditure arising from the excursion of visitors. This figure is a proxy of the economic benefits of the park tourism flow². The expenditure was divided into four main groups: transportation (fuel, highway tickets, etc.), food and beverages (restaurant, food in the hut, picnic), lodging, others (cable car, tickets, renting facilities, local products). It was assumed that the cost for overnight lodging during the visiting day must be added in order to correctly estimate the total cost of the visit³. The estimation of lodging costs, by

² The expenditure arising from the excursion cannot be considered the right measure of the economic effects of tourism. In order to give a correct estimate it would be necessary to make an Input-Output Analysis (Casini, 1993). "However the nature of the tourism industry... makes it (almost) impossible to utilise data produced in national input-output tables." (Slee, Far and Snowdon, 1997). The application of other approaches, as the proportional multiplier methodology (Archer, 1973), requires a great deal of data; this is a very difficult task in the case of Natural Park of Ampezzo Dolomites because of the wideness of the tourist basin.

³ Obviously, this is a simplification because the lodging expenditure could not be considered a strictly complement to the visits, but there are no other acceptable approaches to solve the problem.

excluding people staying in alpine huts, was done using the data of a Provincia Autonoma di Trento study (1997). The deflated lodging prices were established and are reported in table 14.

The daily visit expenditure changes in relation to accommodation (table 14). It varies starting from 31.000 liras of people camping to 120.000 liras of the ones lodging in the hotels. Quite relevant is the expenditure of daily visitors (38.000 liras). Obviously, the most important part of the expenditure for the tourist is lodging while for the daily visitors it is food.

In order to visit the park tourists spent about 34 billions liras in 1999. This figure is obviously only a rough estimate, but it underlines the importance of the amenities of the park. From the point of view of rural communities the park plays a very important role by generating a relevant economic flow and by creating a great deal of employment.

About one half of the global expenditure has to be related to lodging costs (16 billions liras), followed by food (10 billions liras) and transportation (3,8 billions liras).

Tourists staying in hotels and boarding houses spent 46% of the whole expenditure, although visitors lodging in alpine huts represent about 11% of the total expenditure. This last category of users could be assimilated to the so called ecotourist. Therefore, even in a world-wide famous tourist site as Cortina, the ecotourism phenomenon plays a very important role.

Moreover, it has to be underlined that economic flows generated by daily trippers, campers and holiday house owners are really huge although they are usually ignored by official statistics. So in Italy we almost do not know anything about their number or characteristics.

Tab.14 Average daily expenditure in relation to accommodation.

Average expenditure per person (liras)

	Daily visitors	Hotels	Boarding house	Lodging house	Campsite	Holiday house	Alpine huts	Others
Transportation	12.445	2.187	4.625	2.547	1.682	2.930	34.560	29.933
Others	3.556	10.075	11.000	5.569	5.071	8.154	2.500	16.455
Food	22.000	14.611	10.804	13.170	9.814	13.077	76.526	41.818
Lodging	0	99.000	75.000	27.000	15.000	16.000	0	5.000
Total	38.001	125.873	101.429	48.286	31.566	40.161	113.586	93.206

Total estimate (millions)

	Daily visitors	Hotels	Boarding house	Lodging house	Campsite	Holiday house	Alpine huts	Others	Total
Transportation	1.529	162	294	223	153	182	1.162	159	3.864
Others	437	747	699	487	461	507	84	87	3.509
Food	2.703	1.083	687	1.151	891	814	2.574	221	10.125
Lodging	0	7.341	4.767	2.360	1.363	996	*	26	16.853
Total	4.670	9.334	6.447	4.220	2.867	2.499	3.820	494	34.351
%	13,6	27,2	18,8	12,3	8,3	7,3	11,1	1,4	100,0

transportation = fuel and highway ticket

other = cable cars, local products, renting facilities

food = food and beverage (restaurant, food in the alpine hut, picnic),

accommodation = average daily lodging cost

* for those who stay in the alpine hut the food figure covers also lodging

6. Recreational benefits.

It is well known that parks produce a great amount of recreational benefits. A large number of studies both in Italy and abroad highlighted that recreational value of the territory is higher than any other alternative economic activity.

The acquisition of such information can be very important in the management of the protected areas (Marangon e Tempesta, 1998). In fact, a trade-off between the number of visitors, recreational benefits and the impact of tourism on the environment can be observed. The attempt to reduce the tourist flow in order to decrease the impact, can reduce both the number of expected visits, the recreational benefits and the expenditure flow.

International literature suggests several approaches for estimating such benefits. The use, whenever possible, of more than one approach is also recommended. It is in fact well known that each approach can be biased (Garrod and Willis, 1990; Bishop and McCollum, 1998).

In the case study of the Natural Park of the Ampezzo Dolomites the following approaches were adopted:

- individual travel cost method (ITC) (Walsh, 1986; Signorello, 1986; Randall, 1994);
- contingent valuation method (CV) open ended and close ended format (Mitchell and Carlson, 1989; Signorello, 1990; Garrod and Willis, 1992; Romano and Carbone, 1993).

6.1 Individual travel cost

Four different hypotheses about the visit costs were considered:

- a) mere transportation costs;
- b) hypothesis a plus parking and cable cars tickets;
- c) hypothesis b plus food costs (meal and others);
- d) hypothesis c plus lodging costs.

The estimation of the demand function was made firstly using the current methodology suggested in the literature by using one single function for all interviewees. Both price and income elasticity appeared to be very low. This is probably due to an operative distortion related to the estimation of a single demand function suitable for people with different utility function. In order to overcome this problem, interviewees were grouped by using the ratio between the total expenditure to visit the park over a year and their income. Such a ratio is equal to the demand function intercept under the hypothesis of a Cobb-Douglas utility function (Varian, 1990; Tempesta and Thiene, 1999). Four different demand functions were estimated in order to calculate consumer surplus. The following values were obtained:

Costs hypotheses	surplus	
	per trip (lire)	total (million lire)
a) mere transportation costs	1.760	950,4
b) hypothesis a plus parking and cable cars tickets;	5.975	3.226,5
c) hypothesis b plus food costs (meals and others)	14.758	7.969,3
d) hypothesis c plus lodging costs	29.343	15.844,6

The effect of the considered costs on the consumer surplus is very strong, but, considering the characteristics of the study area, realistic estimations seem to be hypotheses "b" and "c". The amount of recreational benefits lies between 3,2 and 7,9 billions liras per year.

6.2 Contingent valuation

The estimation of recreational benefits using CVM implies the definition of both hypothetical market and the elicitation methods. With reference to the first point, the following question was asked:

*“ The number of visitors of the park has largely increased in the last few years. If this trend continues there could be negative environmental impacts such as: paths degradation, excessive trampling down on the pasture and meadows and the disappearance of some vegetal species, disturbance of wild animals, air pollution due to cars, etc.
In the hypothesis of introducing an entrance fee aimed at reducing the number of visitors, would you paywithout reducing your visits per year to the park? Yes No
If No, could you tell us the reason?
Could you tell us the amount of fee that you would pay? _____ ”*

A logit model was estimated. Using the Hanemann approach (1984) we calculated the median and the mean WTP. Then, a second WTP was estimated by using the open ended format. Several interviewees (31,9%) gave protest bids (table 15). Such a phenomenon was particularly strong among daily visitors. People giving protest bids were therefore excluded from the analysis. Through the close ended approach the following logit function was estimated:

$$\text{PROB YES} = [1 + \exp (-2,2656 + 0,00018 \text{ WTP})]^{-1}$$

$$\text{Chi square} = 152,6 \quad - 2 \log \text{likelihood} = 313,0$$

$$\text{Overall percent correct} = 79,6\%$$

Mean WTP is equal to 13.135 liras and the median WTP is 12.586 liras per excursion. The total amount of recreational benefits is equal to 7.093 billions lire per year.

The open ended approach gives a WTP equal to 8.385 liras, a figure much lower than the close ended estimation. This means that some interviewees adopted a strategic behaviour (free-riders). By observing table 15 if we exclude protests, the mean WTP is quite similar among people using different types of lodging. Only visitors staying in the alpine hut showed a larger WTP, but this is due to the fact that they stay inside the park boundaries five days on the average.

By considering both travel cost and CVM we could assume that the amount of recreational benefits yearly generated by the Park lies between 7 and 8 billion liras. That is a value of about 700.000 liras per hectare per year.

Table 15 Willingness to pay for entrance fee (WTP) and relation with accommodation.

	Interviewees n.	Willingness to pay interviewees		Mean WTP (lire)	Trips	Benefits (million)
		n.	%			
Daily visitors	111	60	54,1	8.133	122.884	999,5
Hotel	72	51	70,8	8.245	74.154	611,4
Boarding house	46	34	73,9	8.868	63.561	563,6
Lodging house	100	76	76,0	8.243	87.396	720,4
Camping	59	37	62,7	8.973	90.839	815,1
Holiday house	91	66	72,5	7.659	62.236	476,7
Alpine hut	14	10	71,4	14.350	33.634	482,6
Other	11	9	81,8	6.500	5.297	34,4
Total	504	343	68,1	8.385	540.000	4.703,8

7 Conclusions

Parks play a crucial role in the mountain areas endorsement of tourism sustainable development. Alpine tourism will only survive if landscape and the environment will be preserved. In fact the tourist is not interested in the use of tourism facilities by themselves (hotels, restaurants, and so on); he will in fact use the above facilities in order to enjoy the mountain environment. Therefore, the recreational and tourism exploitation of the alpine resources firstly means the environment preservation. Secondly, means for improving the environment, historical and cultural understanding will have to be pursued. This is also important for developing low impact sports facilities. From this point of view, it becomes important to gain much more detailed information on tourism demand. The only knowledge of the economic issues involved in the tourism development allows their management.

It is therefore important to define the tourism flows and its related costs and benefits and the fulfilment of this aim strictly depends on to the realisation of a tourism information system. The present research has supplied a methodology for surveying the topic information for realising integrated policy.

Results have highlighted relations between visitors and the territory. On the other hand, expenditure and benefits were calculated. A detailed analysis of the visits on the different territory sites was made. A map of the most attended areas was developed.

For the first time, the relationship among lodging facilities, activities and sites visited has been studied. It has been observed that there is a close link among the above elements. Therefore, any environmental policy adopted by the park will determine important changes on the tourism expenditure and on the benefits connected to the recreational activities.

Moreover, any action of tourism exploitation inside a protected area will have necessarily an integrated and holistic approach.

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