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► To cite this version:

Yohann Rech, Elodie Paget, Frederic Dimanche. Uncertain tourism: Evolution of a French winter sports resort and network dynamics. *Journal of Destination Marketing & Management*, 2019, 12, pp.95 - 104. 10.1016/j.jdmm.2019.03.003 . hal-03480659

HAL Id: hal-03480659

<https://hal.science/hal-03480659>

Submitted on 20 Dec 2021

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**Uncertain tourism:
Evolution of a French winter sports resort and network dynamics**

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1. Introduction

France has an important position in the international winter tourism market. With 51 million skier visits during the winter of 2016-2017 (Vanat, 2018), it ranks second in the world just behind the USA and ahead of Austria. France has 336 winter sports resorts with a total of 3391 lifts (1121 aerial lifts, 2238 ski lifts and 32 other lifts), which represent 18% of the worldwide capacity (STRMTG, 2015). Seven mountain ranges are suitable for skiing, and among them, the Alps (Northern and Southern) have the largest number of lifts. In fact, these two ranges alone account for 204 winter sports resorts. While there were ski resorts before the 1960s, the era of planned development of the mountains began in France in 1964, when a proactive state policy led to the rapid growth of the tourism sector. As Guerin (1984, page number required) explains, “the setting up on August 10, 1964 of an Interdepartmental Mountain Planning Committee to coordinate and guide investments for the creation of winter sports resorts is a fundamental date because it is the realization of an idea: the mountain is a playground.” Many resorts were created thanks to this deliberate tourism policy and the national ‘Snow Plan’ in 1970 accentuated this development. From the 1980s, the creation of new resorts became a rare event and there were instead expansions or connections between existing resorts. In contrast, the lift capacity for transporting skiers was greatly increased and most facilities have been renewed in the past few years.

Mountain tourism represents a very important market in France, with €9 billion of revenues (ATOOUT France, 2015). However, the strong development of the sector up until the beginning of the 2000s has tended to slow and serious difficulties have emerged. Winter tourism (and particularly the skiing market), which was for a long time considered as ‘white gold,’ has experienced important changes. The difficulties are both conjunctural and structural. There are especially large differences among the regions and among the mountain ranges (for example even in the heart of the French Alps, the Northern Alps offer larger and more famous resorts such as Chamonix, Megève, and Les Arcs), but there are also disparities with regard to resort management. In France, the ski resorts can be managed by public bodies, by private operators, or be the result of a public/private partnership. Moreover, an ever-greater dichotomy can be observed between the large and very prosperous resorts, which have a vast

35 ski area at over 2000 m altitude (with glacier skiing) and others, much smaller, located at
36 lower altitudes with a diminishing clientele. If winter sports resorts are particularly vulnerable
37 to climate change (Agrawala, 2007; Simpson, Gössling, Scott, Hall, & Gladin, 2008), this is
38 even more dramatic for those that are located at lower altitudes. As explained by Soboll and
39 Dingeldey (2012, p.102), “several ski areas, particularly the smaller ones at lower altitudes,
40 might cease ski operations and switch to snow-independent forms of winter tourism or to
41 summer tourism instead.” Faced with the current climate evolution and haphazard snowfalls,
42 these ski resorts experience increasing difficulty to provide services for the whole of the
43 winter season. As highlighted by Scott, McBoyle, Minogue, and Mills (2006, p.393), “climate
44 change will create winners and losers in the ski industry of eastern North America.” This
45 statement is equally valid for Europe as shown by studies in Sweden (Moen & Fredman,
46 2007), Austria (Wolfsegger, Gössling, & Scott, 2008), or Switzerland (Elsasser & Messerli,
47 2001). The risks are not concentrated in only one geographical region: they are felt just as
48 much in North America as in Australia (Morrison & Pickering, 2012) or in the Alps (Elsasser
49 & Urki, 2002; Koenig & Abegg, 1997).

50 This research project aims to understand how resorts are facing change. The study
51 focuses on all the conjectural (e.g. climatic risks, economic development, etc.) and structural
52 (e.g. changes in the management of the resorts, development of the services provided, etc)
53 changes that produce new forms of organization within the resorts themselves. These can be
54 analyzed according to Callon et al.’s (2011) study, which explains that there is a significant
55 difference between risk and uncertainty. In the first case, scientific knowledge is sufficiently
56 advanced to make well-grounded decisions, while in the second, situations are more complex
57 because knowledge is not yet well-established. Changes affecting winter sports resorts relate
58 more to the second case because on the one hand, there is a controversy (or several) with
59 regard to these changes (e.g. about climate change), while on the other hand, winter tourism
60 mainly suffers from uncertainty (about the clientele, the economic situation, the snowfall,
61 etc). Climatic uncertainty particularly illustrates this situation. Some winter seasons can
62 present numerous episodes of snowfall whereas others can be dry and thus catastrophic from a
63 winter tourism perspective. The situation is even more complicated because a very snowy
64 season can also turn out to be disastrous: the weather can be so bad that it deters
65 holidaymakers from choosing a winter vacation. It is therefore uncertainty that is dominant,
66 since no model can predict long-term development. For this reason, the definition of an
67 appropriate tourist policy remains complex and reflects the need to ‘act in an uncertain world’
68 (Callon et al., 2011). The analysis of the changes proposed by this study therefore allows a

69 shared exploration ‘of possible worlds’ by discussing the suitability of certain political
70 choices. It is above all a question of understanding how actors are involved in these tourist
71 controversies and what the terms of the debate are. It is also a matter of comprehending how
72 these controversies help to create the ‘collectives’, integrating actors into the debate and
73 mobilizing spokespeople from sports, tourist, environmental, or user associations. From this
74 perspective, actor-network theory (Callon, 1986; Latour, 2005; Law, 1994) is particularly
75 relevant as it captures new forms of organization and ‘collectives’ that are created due to the
76 new developments that affect resorts.

77

78

79 **2. Actor-network theory and tourist uncertainties**

80

81 2.1. Actor-network theory as a background

82

83 This study adopts a social constructivist approach with actor-network theory (ANT)
84 serving as the foundation to understand how the actors adapt to the changes that take place in
85 ski resorts and how they manage nature. The aim of ANT is to show how technical or
86 scientific innovations are made possible because of the association of human and non-human
87 entities, which together can form a socio-technical network (Akrich, Callon, & Latour, 2002;
88 Latour, 1987, 1996). This sociological approach deals with the society being formed and tries
89 to understand how ‘collectives,’ uniting various entities, are produced. It thus rejects the
90 sociologizing conceptions that explain social facts by other invisible social dimensions.
91 Collective action is composed of individuals but also of objects that classical sociology leaves
92 aside. The socio-technical networks being formed, which bring the innovations (or which are
93 at the core of important controversies), have therefore this particular quality: they are hybrids
94 that are composed of humans and non-human entities. One of the specificities of the actor-
95 network theory is thus to transcend the classical dichotomies upheld by the social sciences,
96 not only between the technical and the social, but equally between the individual and the
97 group, the micro-logical and the macro-logical, and even more between the social and nature.

98 The epistemological position of this approach rests on four principles (Law, 1994).
99 The first is the ‘principle of symmetry’ (Callon, 1986). This does not mean egalitarianism
100 between humans and non-humans, but simply that the researcher should not “impose a priori
101 some spurious ‘asymmetry’ among human intentional action and a material world of causal
102 relations” (Latour, 2005, p.76). While the modern world has created a great division between

103 humans and non-humans, it is, in contrast, a matter of reconsidering all entities that transform
104 the action. In fact, non-human entities have a capacity to perform the social, that is, to
105 transform it and recompose the relations among the actors. The second principle is that of
106 'reflexivity'. It is fundamental in ANT as it is a strongly epistemological position. Law (1994)
107 refuses to think that sociologists are observing the actors they are studying from afar. In fact,
108 even if the concepts used are different and the professional aspirations are divergent in terms
109 of purpose, all are participating together in the same movement. However, it is not a question
110 of objectivizing the actors' words but rather of following them in their explanations and their
111 activities (Latour, 1993). The actors are credited with the ability to explain their actions and to
112 have true self-reflexive activity on their actions. The position that sociologists hold in their
113 field of study is therefore redefined. It is a question of rethinking authority and no longer
114 establishing an asymmetry between the experts (the scientists) and the uninitiated (the actors).
115 The third principle is that of 'non-reductionism'. This concludes that the social cannot be
116 reduced to *a priori* categories. The approach is therefore close to ethnomethodology
117 (Garfinkel, 1967) and this precept of 'non-reductionism' can only be applied if one begins to
118 describe before explaining, by telling 'in-depth stories' (Law, 1994). Finally, the fourth
119 principle is that of 'recursiveness'. This is a matter of considering the social in its dynamics
120 and its instability. The social realm moves and is in perpetual transformation. Society is not
121 stable but uncertain and it is precisely this dimension that seems to be the most relevant to
122 understand contemporary mutations.

123 While actor-network theory has unquestionably contributed heuristically to sociology
124 and therefore to the understanding of social reality, it has also been the subject of much
125 criticism and is relatively divisive in the field of social sciences. Like any theoretical
126 approach, it presents limits that must be acknowledged. Several critiques have addressed
127 ANT, particularly in the field of science studies (Bloor, 1999). Such critiques particularly
128 concern the limits of symmetrical anthropology (Chateauraynaud, 1991; Grossetti, 2007) and
129 the metaphorical dimension of networks (Dubois, 2007). The controversies surrounding ANT
130 are numerous and need to be integrated to avoid any dogmatic use of this approach.

131

132 2.2. ANT and tourism

133

134 Actor-network theory has already formed the basis for various tourism studies (e.g.,
135 Dedek, 2017; Franklin, 2004; Johannesson, 2005; Jørgensen, 2017; Paget, Dimanche, &
136 Mounet, 2010; Ren, Pritchard, & Morgan, 2009; Ren, 2011; Rodger, Moore, & Newsome,

137 2009; Tribe, 2010; Van der Duim, 2007). It can be considered a new field of research in
138 tourism (Cohen & Cohen, 2012). However, in spite of this trend for research on tourism from
139 the ANT perspective, there is a certain fragmentation in the field of these studies. They are, in
140 fact, very diverse in terms of the objects of study and they vary from empirical to theoretical
141 (or even epistemological) considerations, and from case studies to more general analyses. The
142 main interest of ANT is to be able to comprehend tourism in its dynamic state, while at the
143 same time investigating it at multiple levels, going beyond the classical borderline between
144 local and global. It is also a way of understanding the phenomenon of generalized mobility
145 which tourism represents. According to Urry (2005, p.189), “this mobility is produced by
146 hybrids, flowing along ‘scapes.’ These networks include ‘physical’ and ‘human’ entities,
147 whose power derives from their complex and fluid association.” Therefore, ANT allows for
148 the understanding of the tourist phenomenon that is in fact a hybrid network of actors and
149 things. Objects fully participate in the creation of the tourism site and this materiality
150 performs the tourism site as much as the tourists themselves (Johannesson, 2005; Ren, 2011).
151 For Van der Duim (2005, p.86), “a concern with materiality in tourism is a concern with cars
152 and planes; restaurants, campsites and hotels and their supplies; and natural objects like seas,
153 beaches, hills and lakes and their related flora and fauna.” ANT also allows the researcher to
154 produce a territorial diagnosis of tourist destinations, by including how translation processes
155 (Callon, 1986) are accomplished. It is, for example, what Arnaboldi and Spiller (2011)
156 propose in the study of cultural districts, explaining that the collaboration among actors is
157 possible when three stages are in place: enrolling actors, fact-building, and circulating
158 translations. In the same vein, Paget et al. (2010) have shown how a ski resort can be
159 considered to be a hybrid network and how a tourism innovation can be imposed when a
160 translator (in this case an entrepreneur) commits himself to making it work and manages to
161 mobilize a *collective* around his project.

162

163 2.3. Winter sports resorts as an uncertain world

164

165 The conceptual framework of this research is based on ANT. However, it is difficult to
166 consider this theoretical approach in its entirety, without bearing in mind the changes it has
167 experienced over the past 30 years. The weakness of the tourism studies that have mobilized
168 ANT is perhaps to have been mainly inspired by the sociology of translation, without taking
169 into account recent theoretical developments (Rech & Paget, 2017). By starting from a
170 common foundation of the ANT concepts, the specificity of the present research is to mobilize

171 the traditional approaches to ANT (Callon, 1986; Latour, 1987) while also provoking
172 reflection using more recent theories which constitute developments in this approach. Indeed,
173 the latter, addressed in *Politics of nature* by Latour (2004) as well as in *Acting in an uncertain*
174 *world* by Callon, Lascoumes, and Barthe (2011), offer a particularly relevant framework for
175 studying tourism sites. They help to better understand the dynamics of change that can occur
176 and the strategies of resistance faced to certain developments, as well as the hybrid forms that
177 emerge and generate controversies restructuring the social. This perspective, in fact, allows
178 controversies to be researched that are of importance in the tourism sector and have, to date,
179 been the subject of little research.

180 In order to analyze the current developments in winter sports resorts, this research
181 project was based on three propositions from Latour (2004). The first is to discover how many
182 humans and non-humans make up the socio-technical network, called the 'collective'. Thus, it
183 is necessary to find the number of entities that participate in the collective action. Latour
184 (2004) calls this the *power to take into account*. It aims to identify entities that can integrate
185 debates but also clarify the terms of the debate. The second proposition is to know whether
186 humans and non-humans can live together in a collective. Latour calls this the *power to put in*
187 *order*. It is a question of understanding, on the one hand, how the common problems are
188 ranked and, on the other hand, how they are institutionalized and formalized. Lastly, the third
189 proposition concerns the exploration of common worlds: the way in which a new governing
190 system is installed. Following this, Callon et al. (2011) have shown how technological and
191 scientific developments do not always create certainty with regard to future situations. Public
192 policies are made in emergency situations where all the information cannot be cross-
193 referenced and above all, they are often written without established scientific knowledge.
194 According to this, we can state that lower altitude ski resorts, faced with the serious
195 consequences of change (e.g. climate evolution, customer volatility, international competition,
196 quick transformations in sports practice) are in situations of uncertainty that render
197 management very complex. Tourism policies should adapt to unexpected situations and try to
198 respond to different problems and questions: Will lower altitude ski resorts continue to
199 receive snowfall in the long term? Should they invest in new lift equipment without a clear
200 view of the future? Should public investments be chosen in spite of the financial difficulties of
201 the local authorities or should they find private investors? How can they diversify resort
202 supply without knowing precisely how demand will evolve? It is however not possible to
203 have clear answers to those questions at the moment.

204

205 **3. Methodology**

206

207 3.1. Presentation of the field investigation

208

209 The field investigation for this research took place in the Natural Regional Park of
210 Chartreuse (see Figure 1) in the Northern French Alps. This is a case study (Miles &
211 Huberman, 1994) and is conducted at two levels. The first is very local as it is the study of a
212 former winter sports resort, the *col du Coq*. This resort stopped operating in 1995 but the ski
213 lifts are still in place, although unused. It was a ‘micro ski resort’ like many in France,
214 composed of some ski lifts and located at about 1400 m altitude. The site is therefore marked
215 by its tourism past and over the last few years has become a brownfield site. Despite the fact
216 that the resort is no longer active, it is still very popular, especially for winter sports activities
217 (snowshoeing, ski touring, sledding, etc). The site has no buildings to offer on-site
218 accommodations to tourists. Tourist accommodations are therefore not at the resort but below
219 it in the nearby villages. The second level of analysis is at a more territorial level and explores
220 the links between this former winter sports resort and the neighboring resorts on the same
221 mountain range. These winter sports resorts are also small in size but continue to function,
222 even though they are located at a lower altitude (900 m) and are experiencing serious
223 difficulties. These are the *Saint-Hilaire*, *Saint-Bernard*, and *Saint-Pierre de Chartreuse*
224 resorts which belong to the territory of the *Plateau des Petites Roches* (PPR).

225

226 [Please insert Figure 1 about here]

227

228 The field investigation site was chosen on the one hand because it corresponded to the
229 researchers’ desire to investigate a tourist controversy by studying a winter sports resort. The
230 *col du Coq* resort matches this because it has been closed and has been the subject of local
231 debates about the future of the site. Indeed, the *col du Coq* site is very busy in winter and has
232 better snow conditions than other ski resorts at lower altitudes. As a result, the question of its
233 tourist future arose as well as that of its commercial exploitation. On the other hand, the
234 Natural Regional Park of Chartreuse funded the study. The choice of the field study was made
235 in agreement with the scientific director of the Park as well as the manager of outdoor
236 recreation, in order to respond to their concerns. Therefore, the analysis of the controversy can
237 be conceived as a decision-making aid, since the Natural Regional Park of Chartreuse had to

238 make important political choices to define a future for this site, while at the same time
239 defining a global strategy for the other ski resorts in the territory.

240

241 3.2. Qualitative research

242

243 The research project was carried out using a comprehensive (Weber, 1978) and
244 inductive (Glaser et Strauss, 1968) approach. Taking a qualitative perspective (Hollinshead,
245 2006; Jamal & Hollinshead, 2001; Pernecky & Jamal, 2012; Phillimore & Goodson, 2004;
246 Riley & Love, 2000; Walle, 1997; Westwood, Morgan, & Pritchard, 2006), the empirical
247 material collected rests on different methods of investigation, where data triangulation sought
248 to guarantee the reliability of results and allow for an objective analysis (Decrop, 1999;
249 Thietart, 2001; Yin, 2003). A multi-method approach was thus used, consisting of personal
250 interviews (with two different target publics: the site actors and the users), documentary
251 analysis, and observation.

252 The study sample was composed of 25 site actors. An interview guideline was prepared in
253 advance according to several dimensions related to the problem and semi-structured
254 interviews were conducted. Specifically, the actors (concerned by the site or by the former
255 resort) were asked about:

256

- 257 • Their respective roles, their objectives, their strategies and their (conflictive or
258 cooperative) relations with the other actors;
- 259 • The site and the different practice areas, the sports facilities and products;
- 260 • The involvement of the actor in the tourist controversy concerning the future of the
261 resort and its representation of the management mode that should be chosen (e.g.
262 tourism management, environmental management);
- 263 • The representation of changes and existing problems (e.g. climate,
264 accommodation, high usage rates);
- 265 • Tourist and leisure policies, and choices concerning the future of the low altitude
266 resorts.

267

268 The choice of relevant stakeholders was made according to the methodological
269 precepts of ANT, by following the actors and the controversy. The relevant actors who could
270 represent an organization (or an authority) were interviewed, whether independent actors or

271 elected representatives. First, the actors were chosen who directly or indirectly structured the
272 context of the action, and this list of actors was later extended as the study progressed. The
273 number of actors is limited by the small size of the tourist site. Most of the relevant actors
274 were interviewed. As a result, the researchers met the protected area managers, the municipal
275 and inter-municipal elected officials, the staff of tourist offices, a host, the sports service
276 providers, the sports and leisure associations, an association of environmental protection and a
277 farmer (see Table 1).

278

279

[Please insert table 1 about here]

280

281 To complement the interviews carried out with the site actors, a series of interviews
282 was also conducted with the site users. Consideration of the demand is a factor to take into
283 account because, as Frochot and Kreziak (2008) pointed out, non-ski snow activities have
284 been the subject of significant development by resorts. The case of the *col du Coq* resort is
285 interesting because the ski lifts are unused, but the site is very popular and the practitioners
286 come necessarily for activities other than alpine skiing. These interviews were thus important
287 to understand the site users' points of view in the face of the plans for the resort and their
288 position in the controversy. A total of 24 four interviews were conducted during the winter
289 season with the people who used the *col du Coq* area for recreational activities. These
290 interviews were midway between semi-structured and comprehensive interviews (Mucchielli,
291 1996). They were carried out face-to-face on site, after subjects had finished their activities. In
292 order to have different profiles for those practicing the activities, the survey area on the site
293 was varied, as were the days on which the interviews took place (i.e. weekdays, weekends,
294 holidays), the time (i.e. morning, midday, evening) and the weather conditions (i.e. good
295 weather, cloudy weather, mist, and snow). A specific interview guide was created. The
296 dimensions of this guide dealt with: (1) the use of the *col du Coq* site (in terms of activities,
297 routes, frequency of attendance, and activity modalities), (2) the interviewee's perceptions of
298 the site (knowledge of the site with regard to the area and the environment), (3) the
299 development of the site and its 'tourist' future (notably the question of the re-launching of the
300 winter sports resort), and (4) perceptions about site management. The interviewees could also
301 address other topics in the discussion. These elements were to help understand their
302 perception of the controversy and their level of involvement.

303 In addition, many documents were identified and analyzed, such as agreements
304 between actors, leases, cadastral maps, tourist brochures, cartographic data, management

305 plans, local municipal ordinances, and minutes of meetings. All these elements are the many
306 traces of the social that enable to reconstruct the associations of actors (Latour, 2005) and to
307 trace their links.

308 Finally, observations were carried out on site. They allowed for a detailed study of the
309 different activity areas in order to ask the actors the most relevant and precise questions
310 possible. Observations were also made of the people practicing sports in order to comprehend
311 the different ways in which the site is used. Ethnographic surveys were carried out using a
312 research blog, where all relevant information for analysis was recorded.

313

314 3.3. Data analysis

315

316 All interviews were recorded with the agreement of the interviewees. They were
317 transcribed in their entirety and then analyzed using a content analysis grid (Bardin, 2007).
318 This analysis grid was composed of the topics of the interview guide that was related to the
319 central thesis, and that was completed with new dimensions that appeared in the interviews.
320 Finally, these topics were also developed during the analysis itself because following a
321 controversy (Latour, 2005) is useful to integrate elements of discourse and arguments that
322 may be important and were not previously considered. Moreover, the data analysis requires
323 the production of a somewhat random report (Latour, 2005). It means considering the
324 researcher as an integral part of the research context (and not as an individual looking down
325 on what he or she is studying). The study resulted in a research report that presented the issues
326 around the controversy and that served as a decision-making tool for those who manage the
327 site.

328

329

330 **4. Results: Description and analysis of a tourism controversy**

331

332 The analysis of socio-technical controversies is an excellent means of exploring the
333 stakeholders, redefining the problems and describing the role of the protagonists (Callon et
334 al., 2011). To follow the actors in the controversy is to understand how their relations and
335 their organization are transformed. The changes that affect low-altitude resorts produce
336 organizational transformations and the ANT allows us to better understand them. First, the
337 origins of the tourist controversy and the role of the actors will be described, An in-depth
338 analysis of the arguments that are developed will then be undertaken. Finally, the analysis will

339 focus on three essential elements that contribute to redefining the relationships between
340 actors: the snow as non-human and unpredictable, the changes in supply and accommodation
341 needs, and finally the way to promote the site.

342

343 4.1. Tourism actors in the controversy

344

345 This first part of the results refers to the *power to take into account* (Latour, 2004) and
346 thus to the census of the actors involved in the controversy to understand their degree of
347 involvement. The first task of collecting the entities involved in the action is not carried out *a*
348 *priori* but is the result of the interviewing work by following the actors and the controversy.
349 This is important as it allows a better understanding of how the controversy, through different
350 stages, helps to redefine relations and the tourism network. The development of the *col du*
351 *Coq* resort presents different aspects of a controversy, which can be qualified as ‘touristic’ in
352 the sense that the site’s future remains unresolved and that each actor deploys particular
353 arguments concerning this uncertainty.

354 It is necessary first to explain the object of discord and to go back to the beginning of
355 the controversy. While the organization of the different activities at the *col du Coq* raises
356 various problems, the question of the re-opening of the ski lifts is a central point. In fact, the
357 *col du Coq* resort has been closed since 1995 and it has gradually become a brownfield site.
358 However, after some years, the resort has begun to experience renewed interest from local
359 stakeholders, despite the advent of climate change. The project to re-launch the resort has
360 provoked an important debate at the local level. The discord is not just about re-launching the
361 resort: it takes different forms that oppose in a complex way those in favor and those against
362 the resort. There is a whole range of positions that can be observed and which can, at times,
363 be seen changing. The controversy has taken a socio-technical dimension in the sense that it
364 involves a variety of actors (managers, elected representatives, sport providers, hosts,
365 environmentalists, etc) around the various physical elements: re-appropriation of a touristic
366 area, development of the site, dismantlement or re-launching of the ski lifts, whether or not to
367 clear snow from the roads, climate change and sustainability of resorts at lower altitudes,
368 environmental uncertainty on the impact of outdoor activities, creation of car parks and the
369 resulting consequences in terms of attendance.

370 Four types of actors are involved in the development of tourist activities at the *col du*
371 *Coq*. First the elected officials who revolve around *Saint-Pierre de Chartreuse*, who are
372 responsible for the tourist area but do not want to develop alpine skiing facilities. Second, the

373 ecologists, the technicians of protected areas, as well as some lower altitude mountain guides,
374 who do not want the mountain to be developed and advocate the dismantlement of the
375 abandoned pylons. Third, the tourism stakeholders on the territory of the PPR, who are
376 mobilizing to re-launch the *col du Coq* ski resort. Fourth, the elected officials of the PPR, who
377 wish to develop their own small winter sports resort, and to give up on the *col du Coq*, against
378 the advice of tourism stakeholders. All these actors are inter-related around the same common
379 problem: how to use the *col du Coq* tourist area. However, the approach in terms of ‘local
380 order’ (Friedberg, 1996) only provides a partial reading of the situation as in reality, this
381 common ‘spatialized’ problem contains multiple problems referring to action contexts that are
382 distributed all over the *Chartreuse* territory. The controversy has a very complex spatial
383 dimension that should be addressed in terms of networks. The action context of the *col du*
384 *Coq* can only be understood by tackling the situation of the other local winter sports resorts.
385 ANT is therefore particularly relevant in this analysis because, as Latour (2005, p.200)
386 explains, “what is acting at the same moment in any place is coming from many other places,
387 many distant materials, and many faraway actors.” Moreover, each group of actors brings a
388 different answer to the general question, wanting to introduce entities into the collective that
389 others do not want (ski lifts, development of commercial buildings, roads, etc).

390

391 4.2. The arguments mobilized in controversy

392

393 Before addressing the complexity of the controversy, it is important to summarize the
394 different arguments that the various opponents have deployed to justify their positions in the
395 controversy (see Figure 2).

396 **First argument: Abandonment of the project to re-launch the ski resort.** The
397 elected officials from the territory of the PPR and from the heart of the *Chartreuse* range are
398 almost unanimous, in spite of the tensions among them, in that the *col du Coq* resort should
399 not be re-launched. For the elected officials of the middle of the *Chartreuse* Park, apart from
400 economic reasons, environmental arguments are put forward against bringing the ski lifts back
401 into service: “it doesn’t interest us, not because that competes with us here, but simply
402 because it is a unique site; it is a site which should be protected; it is a site which would cost
403 an enormous amount of money and we know it” [elected public official from *Saint-Pierre de*
404 *Chartreuse*]. The villages at the heart of the *Chartreuse* region have no particular ambition to
405 develop alpine skiing on this site. Regarding the PPR, the justification used by the elected
406 representatives mainly focuses on economic arguments and on the general interest that is to

407 encourage the development of the PPR territory: “These were the conclusions of the work in
408 the [Natural Regional] Park where we all worked together, we were all working on it,
409 especially *Saint-Bernard* and *Saint-Hilaire* and as it was seen that our resorts were operating,
410 we could see that we didn’t have the means to have a third. In any case, it was the money that
411 was the sinews of war” [elected representative of *Saint-Hilaire*]. The elected officials justify
412 their preference for not investing in the *col du Coq* by also focusing on the difficult territorial
413 network of the *col du Coq*: “*Saint-Pierre de Chartreuse* didn’t play the game; well that’s true.
414 On the other hand, I understood the mayor at that moment who already had a lot of difficulties
415 with his resort and didn’t want to weigh himself down because it was his responsibility, the
416 *col du Coq* is *Saint-Pierre de Chartreuse*’s responsibility; we shouldn’t forget that either”
417 [elected representative of *Saint-Hilaire*].

418 **Second argument: Dismantlement of the resort.** This argument suggests that the site
419 of the resort is problematic because it is the interface among several protected areas. All the
420 various managers of these areas share the desire to not re-launch winter tourism activities that
421 would require significant development of facilities. Therefore, an environmental and reasoned
422 management is more recommended. For these actors, a tourism site is incompatible with a
423 protected area (which possesses significant regulatory prerogatives). As one of the managers
424 said, “political choices had to be made” [environmental manager of departmental council],
425 either by developing winter tourism, or by creating protected areas. Furthermore, the
426 managers also put forward the idea that the development of the resort contradicts the spirit of
427 the charter of the Natural Regional Park. Some outdoor recreational activity providers such as
428 lower-altitude mountain guides are proponents of these types of arguments and some even
429 advocate, similar to environmental militants, the dismantlement of the old ski lifts: “I think
430 we need action from ‘Mountain Wilderness’ [an NGO] to dismantle all the pylons if things
431 stay the same” [mountain guide]. Another outdoor recreation provider said almost the same
432 thing: “I am for the dismantlement and the return of the *col du Coq* terrain to what it was like
433 when I was a boy. It’s no longer any good for anything” [mountain guide]. The arguments
434 mobilized by users with regard to the future of the site and the problem of the ‘de-
435 touristification’ of the area are the same. Some talk about the place in terms of a tourism
436 brownfield site and advocate the dismantlement of the pylons. The impact on the landscape of
437 the old abandoned resort is highlighted. These are individuals who sometimes clearly perceive
438 the impact of climate change on the lower-altitude resorts and are radically opposed to
439 artificial snow.

440 **Third argument: Development of Nordic skiing.** The development of this activity is
441 often mentioned. A significant number of cross-country skiers leave from the *col du Coq*
442 resort to ski to other Nordic skiing sites. Some cross-country skiing trails are only 100 m
443 away from the old station of the *col du Coq*. Among the various developments under study to
444 develop the *col du Coq*, snowshoeing and Nordic skiing are considered as a means of
445 development: “There is a forest road that will start, which could be used in winter for Nordic
446 skiing and the snowshoe, which would allow an easier junction of the *col du Coq* and the *col*
447 *de Porte* than at present” [elected representative from local council community]. The elected
448 officials put forward the idea that there should be a common tax for the different resorts and
449 above all the possibility of marketing a more extensive product. The development of the
450 mountain through Nordic activities is thus perceived as a means of developing a soft and
451 alternative tourism: less harmful and expensive than the development of a ski resort.

452 **Fourth argument: Snow clearing from the road.** Clearing snow from the road is
453 another point of dissension. During the winter of 2008, the road to the *col du Coq* had been
454 cleared less frequently than in previous winters (no scattering of salt, irregular clearance of
455 snow, etc). This is very important as it impacts the number of visitors and the type of people
456 who come to the site. The people who are opposed to snow clearing either have
457 environmental motives (salt reduction) or are pleased with the fact that it ‘naturally’ regulates
458 the number of visitors. Political decisions have been taken to lessen road clearance in winter:
459 “As the *col du Coq* is closed, there is no activity anymore, at one time we asked to stop
460 salting, after the houses” [elected representative from *Saint-Pancrasse*]. This type of decision
461 has of course a limiting effect on the frequentation of this space. On the other hand, some
462 actors wish the road to be cleared to allow the development of the site and the activities. “At
463 the level of the activity it raises a problem in the sense that if there is a lot of snow, I can not
464 take my clients up there [...], snow clearing is problematic for me at the level of my activity”
465 [Hiking provider].

466 **Fifth argument: Re-launch of the resort.** Finally, another group of actors (hosts,
467 etc.) declare that they are for the re-launch of tourist activities in the *col du Coq*. One of the
468 main arguments is the complementary nature of the PPR resorts and above all the prospect of
469 guaranteeing snow. Indeed, because the *col du Coq* resort faces north it is seen as a way to
470 alleviate the snowfall problems. For them, the site has a higher degree of snowfall than the
471 two resorts of the PPR. Thus, if it were re-launched it would allow tourism to be maintained:
472 “20 or 30 years ago, we could say that there is no snow at *Saint-Hilaire* but that isn’t a
473 problem because there is snow at the *col du Coq*. We could guarantee it, and people came. If

474 there was snow and a ski school, there were no problems and people came” [holiday cottage
475 owner]. The arguments put forward also reflect individual interests as the tourist development
476 of the *col du Coq* would be a way to ensure year-round economic activity whereas at the
477 moment, it is very uncertain. Furthermore, the re-launching of the resort is mentioned by
478 some sports people (mostly locals) who would like to have a rope-tow for children instead of
479 the re-opening of the ski lifts.

480

481 [Please insert figure 2 about here]

482

483 4.3. Snow, an unpredictable, non-human entity

484

485 Snow is a non-human entity that produces uncertainty in winter sports tourism. In fact,
486 scientists have stabilized their knowledge on global warming (Latour, 2015) and the elected
487 representatives of the tourist municipalities have to make decisions regarding the development
488 of the mountain for tourism purposes. Thus, an elected representative from the PPR
489 commented on the new tourist policy in this French department (a territorial administrative
490 unit): “The department does not want to reinvest in the resorts, it’s over. The resorts at lower
491 altitude with climate change, I don’t know if they will last, if they are a tangible reality. But
492 elected officials do not want to invest in the resorts” [elected representative from *Saint-*
493 *Pancrasse*]. This is at the heart of the problem of acting in an uncertain world as described by
494 Callon et al. (2011). The organizational uncertainty that results from random snowfalls at
495 lower altitude does not come from the actors but from things. Without snow, snow-based
496 tourism no longer exists. As one policy-maker explains: “We cannot attract so many people in
497 winter if there is no snow. So in my opinion the problem is still pending. We can do lots of
498 things; it’s true we can diversify, people no longer come just for the snow, just to ski, [...] but
499 with no snow they don’t come at all” [elected representative from local council community].
500 The presence of snow makes winter tourism possible but does not eliminate uncertainty. On
501 the one hand, the period when it snows has to coincide with the high season in the resorts
502 (which in France corresponds to the Christmas holidays and the school holidays in February).
503 On the other hand, the presence of snow is impossible for the actors of tourism to anticipate:
504 “The people who call from all over France to ski, the first thing they say is: ‘Is there snow?’ I
505 always tell them I rent you the facilities, the chalet, I order snow but I can’t promise it. I can’t
506 put it in black on white” [holiday cottage owner]. This uncertainty is therefore particularly

507 complex to manage for the tourism stakeholders because it is difficult to guarantee product
508 quality.

509 The role of snow is central because it produces connections among the sites. Thus, it is
510 impossible to understand the actions and the strategic issues that actors and politicians face
511 regarding the re-launching of the *col du Coq* resort, without looking at the other resorts in the
512 *Chartreuse* range. There are different attachments that are created between the particular areas
513 and sites (and thus between the actors). For example, the elected officials from *Saint-Pierre*
514 *de Chartreuse* do not want to develop the *col du Coq* for alpine skiing not because they no
515 longer believe in winter tourism but because they have other ambitions, such as re-
516 appropriating another small resort that is more accessible for them. The stagnation of the re-
517 launching of the *col du Coq* is above all the result of a political choice. When tourism policy
518 was redefined and a choice had to be made among the three micro-resorts of the PPR, the
519 resorts of *Saint-Hilaire* and *Saint-Bernard* were preferred to the detriment of *col du Coq*,
520 despite the opinion of the tourism service providers. This choice is explained in particular by
521 a disagreement among the mayors of the various municipalities and by the difficulty to set up
522 a tourism policy at the inter-municipality level. In short, the case of the *col du Coq* can only
523 be understood if the core of the problem is shifted towards the other tourism sites in
524 *Chartreuse* and if we retrace all the network connections.

525 Finally, the place given to snow in the network is different for each group of actors.
526 For some of them, snow does not have to define the ‘collective’ and an alternative form of
527 tourism has to be invented (this is the case, for example, of the ecologists, or some technicians
528 of protected areas). For others, snow should totally define the ‘collective’ and there can be no
529 tourism unless it is winter tourism. But there again, the actors disagree. Some consider that
530 the ‘natural’ snow at the *col du Coq* should be exploited while others would like to try and
531 produce ‘artificial’ snow at a lower altitude: for example, at the *Saint-Hilaire* and *Saint-*
532 *Bernard* sites.

533

534 4.4. Reconfiguration of the accommodations and changes in tourist demand

535

536 Among the various changes that affect lower-altitude resorts, the transformation of tourist
537 accommodation supply and the evolution of tourism demand are two phenomena that are
538 closely linked and that are particularly de-structuring for mountain territories. The *col du Coq*
539 does not rely on on-site tourist accommodations. However, these transformations are often at
540 the heart of the debate between the proponents of greater development for the *col du Coq* and

541 the defenders of alternative tourism. In fact, the evolution of tourists' tastes and the re-
542 structuring of the local accommodation supply are elements that are taken into account by the
543 actors. In contrast, the potential solutions to address these changes differ from one actor to
544 another.

545 The PPR territory has a relatively important tourism past thanks to the role played by
546 its two winter sports resorts and the development of hang-gliding and paragliding since the
547 1980s. However, the distribution of tourist beds has been geographically unequal. The
548 municipality of *Saint-Pancrasse*, which is nearer to the *col du Coq*, has never had tourist
549 accommodations, even at the time when the old resort was working: "there are a few holiday
550 cottages, there isn't much. *Saint-Pancrasse* is really a very small village" [elected
551 representative of *Saint-Pancrasse*]. In contrast, the municipalities of *Saint-Hilaire* and *Saint-*
552 *Bernard* have tourist accommodations that are mainly composed of holiday cottages. The
553 golden age of lower-altitude winter tourism seems now a bygone era and the actors
554 unanimously accept that there has been a great reduction in the number of beds available for
555 tourists over the past few years: "there is a lot of real estate pressure on the PPR and in the
556 majority of the rural cottages which had been bought some 30 years ago, people have realized
557 their capital or have retired, and thus have sold the rural cottage which has become someone's
558 main place of residence and no longer offers tourist accommodation" [elected representative
559 *Saint-Hilaire*]. In 15 years, the number of beds available for tourists in the three
560 municipalities dropped from 900 to about 500. The municipalities try to contain this crisis by
561 finding solutions: "we try to keep the cottages we have, especially the communal cottages.
562 We keep them, we try to help people who want to invest in cottages as much as possible, but
563 knowing that our new clientele are customers from Grésivaudan [a valley situated below the
564 PPR], therefore daily, weekend and holiday visitors" [elected representative from *Saint-*
565 *Bernard*]. This is in fact a fundamental transformation that is taking place because the main
566 problem is the shift from winter tourists (who are profitable) to excursionists for outdoor
567 recreational activities (that are not profitable). Also, the difficult adaptation of the actors faced
568 with the evolution of tourists' tastes is revealed in a tourist accommodation crisis, which has
569 not kept up with demand and trends: "I've made some accommodation units in my house,
570 which at one time corresponded to demand. Now it's more difficult because now [tourists]
571 prefer an individual chalet, with every comfort inside, everything new, and so as to my units
572 at home, I have great difficulty in renting them" [holiday cottage renter]. Some socio-cultural
573 changes reveal an individualization of tourist practices and tourists' search for independence,
574 which are out of sync with the current type of accommodation offered. This is not just with

575 reference to the PPR as the center of the *Chartreuse* is also affected, even if its
576 accommodation supply is focused on hotels: “With respect to *Saint-Pierre de Chartreuse*,
577 [...] a tourist accommodation inventory has recently been conducted [...] and now we have
578 150 beds at most in the hotels. So, it’s terrible. Now there are four or five establishments left
579 when fifteen years ago there were eleven of us. It’s dreadful” [elected representative of *Saint-*
580 *Pierre de Chartreuse*]. The different resorts in the *Chartreuse* are therefore confronted with
581 an accommodations restructuring which is taking two forms: on the one hand, a real-estate
582 explosion that is favoring primary (and secondary) places of residence to the detriment of
583 tourist accommodations; on the other hand, an aging supply of accommodation facilities (i.e.
584 cottages on the PPR territory and hotels in *Saint-Pierre de Chartreuse*) that is not responding
585 to the needs of an evolving clientele.

586 However, these difficulties are also related to another factor: the shortening of the
587 winter season and the random snowfalls that mean that winter sports activities cannot be
588 guaranteed anymore. As one of the actors explains: “If we want owners to rent
589 accommodations for tourists, they must be able to rent both in winter and summer, otherwise,
590 if they can only rent in the summer, they would rather rent the cottage for the whole year
591 because there is a large demand for yearly rents, it’s much simpler and more profitable”
592 [association of friends of the *col du Coq* resort]. The tendency that has been observed is
593 therefore a restructuring of tourist accommodation, which is itself not only a change but also
594 the consequence of other changes.

595

596 4.5. The issue of tourism promotion

597

598 The issue of promoting tourism goes back to the way in which the ‘captation’ of sports
599 and tourist publics is organized (Cochoy, 2007). It is therefore necessary to understand the
600 connections among the actors involved in the promotion of the mountain range and to trace a
601 network of inter-relations, which seems to be more about conflict than about cooperation. The
602 organization of tourism promotion for the PPR is difficult. While the tourism office is
603 responsible for implementing tourism policies, which are defined by the elected
604 representatives, the exact opposite can be observed. The tourism office has completely
605 redefined the rules by tinkering with the local legal context and redefining the terms of the
606 tourism policy. By creating a sports and tourism event with an international scope (the Icarus
607 Cup, a paragliding event), it has legitimated at the local level its ability to define the events
608 and/or developments necessary for promoting tourism on the PPR, and it has enrolled a

609 multitude of organizations by granting them a share of the event revenues. Above all,
610 however, it has become financially independent from the public authorities thanks to this
611 event. The tourism office also controls the promotion of the mountain range at the territorial
612 level as it manages the Tourism Development Association (ADT). Thanks to this role, it has
613 managed to create attachments with the tourism suppliers in the PPR territory and to link the
614 different contexts of action in the *Chartreuse* region. But this hegemonic position generates
615 particularly conflictive relationships with the local elected representatives. The tourism office
616 thus partly controls the summer tourism activities (because of its grip on paragliding) but is
617 not able, however, to define the terms of the winter tourism policy. Its action is therefore
618 disputed by the elected representatives but remains an ‘obligatory point of passage’ (Callon,
619 1986) in the organization of territorial promotion.

620

621 **5. Conclusions**

622

623 The aim of this research has been to show how a tourist area can be transformed by
624 various changes, especially climatic, and to provide a fine description of a tourist controversy
625 by following the actors, their arguments, and organizational changes. What we call ‘uncertain
626 tourism’ is a controversial situation that creates significant change around a tourism model
627 and that leads to making political decisions. The case of climate change is rather specific
628 because, as Latour (2017) suggested, there is scientific consensus on global warming being
629 human-induced. Indeed, despite scientists’ agreement, it remains difficult for locals to accept
630 the idea of a changing climate that disrupts significantly a money-making tourism system in
631 their region. The value of this study lies in showing from a case-study the concrete character
632 of climate change, a phenomenon that typically remains abstract and hardly noticeable. Low-
633 altitude winter resorts presents an opportunity to observe organizational change and related
634 conflicts, and ultimately, to question the territory government’s capacity to take up the
635 challenge, govern, and decide matters.

636 At an organizational level, the various situations described earlier question the actors’
637 ability to adapt to change and to consider new solutions. The low-altitude winter sports resorts
638 are experiencing deep changes because of their dependence on snowfall. For a long time, they
639 were in a stable period from an organizational and operational point of view. The
640 relationships were stable and there was a large number of ‘intermediaries’ (Latour, 2005). The
641 climatic risks and their effects have changed the situation and provoked the transition to a new
642 phase, which is characterized by a transformation of the network. Relationships have to be

643 renegotiated by the stakeholders and this has helped to redeploy a multitude of ‘mediators’
644 (Latour, 2005). The situation is particularly unstable because snowfall uncertainty has led to
645 the deconstruction of the tourism network and to the reconfiguration of a new and different
646 one, on a larger scale. This uncertainty creates major conflicts between interdependent
647 stakeholders.

648 At a political level, the current climatic risks and snowfall problems have forced
649 elected officials to reconsider their resort management model. While for many years, climate
650 change (and its effects) has been a matter of fact, it has become a matter of concern (Latour,
651 2004) and winter tourism policy has had to be redefined. It then had to open the black box of
652 tourism policies in order to decide which sites are most likely to be profitable and apt at
653 having snow and attracting tourists, with environmentally friendly features. This new policy
654 did not provide full and immediate buy-in from the actors. It mainly generated a controversy,
655 which then reconfigured the relations and the organization of the resorts at the territorial level.
656 In the case under study, public actors have become more aware of the climatic changes and
657 their consequences on winter tourism than private actors, who continue to be convinced that
658 skiing can remain an attractive market for the territory.

659 While ANT has been of particular interest in tourism research over the last 10 years
660 (Van Der Duim, Ren, & Johannesson, 2017; Beard, Scarles, & Tribe, 2016), this article
661 contributes to the advancement of knowledge in this field for several reasons. First of all,
662 studies on tourist controversies are rare in the literature whereas the analysis of controversies
663 (or the mapping controversies) is at the center of the ANT approach. The instability of the
664 social is privileged in ANT and controversial situations, of which there are many in the field
665 of tourism, deserve special attention because they are often important organizational
666 transformations. In addition, the research contributes to the knowledge of networks in winter
667 sports resorts, as an extension of Paget et al.’s (2010) work. This research therefore had the
668 ambition to mobilize at the same time the traditional approach of ANT while mobilizing other
669 more recent theoretical evolutions. Thus, if the role of non-humans is particularly central in
670 the analysis of tourism-scapes (Van Der Duim, 2007), as shown in the case of snow and the
671 deconstruction of the tourism network, the study also wished to integrate in the analysis of the
672 most recent elements around situations of uncertainty and controversy (Callon et al., 2011),
673 which presents an added value in the understanding of tourism policies. The case of climate
674 change is particularly relevant to these situations of political and organizational uncertainty
675 that Callon et al. (2011) describe, and the transfer in the field of tourist studies is particularly
676 interesting. Finally, the contribution of this research is mainly empirical since it contributes to

677 a better knowledge, by the in-depth description of the controversy, of the transformation of a
678 tourist area and the coordination difficulties of the actors to adapt to the changes.

679 The various changes discussed in this study question the resilience of actors
680 responding to change but also their ability to resist change. While winter tourism has been a
681 lucrative economic activity in France for many years, the actors have been suddenly faced
682 with changes that challenge their mode of organizing and funding, and they have had to adapt
683 to this new uncertainty. The political decision is particularly complex because it has to decide
684 on the future of a site and of a tourism activity sector, by making decisions in a context of
685 uncertainty (Callon et al., 2011), without being able to project on future snowfalls and the
686 development of the winter sports market. Small French winter resorts persist only because of
687 public subsidies despite repeated financial losses. In this case, however, there appears to be a
688 political willingness to change the tourism model and to forsake a skiing product that is
689 destined to disappear. The challenge resides in public and private actors' ability to imagine
690 and develop alternative products that would attract tourists. This situation further highlights
691 the divide in the French Alps between low-altitude resorts that suffer from climate change and
692 the very profitable high-altitude stations that do not have to question their operations and
693 business model. Climate change leads to widening economic and social inequalities in some
694 tourism destinations. A managerial consequence may be to test new development models on
695 low-altitude resorts that could help mitigate problematic changes in mid-altitude stations that
696 are already and increasingly affected by this phenomenon. Ultimately, it is the sustainability
697 of a tourism model that is questioned and tested by this study. Similar to seaside destinations,
698 those small skiing resorts may become "disappearing destinations" (Gössling, Scott, Hall,
699 Ceron, & Dubois, 2012; Jones & Phillips, 2011). At least mountain resorts can rethink and
700 design their future: low-lying seaside destinations do not have that chance.

701

702 **Funding**

703

704 The Natural Regional Park of Chartreuse partially funded this research

705

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Figure 1: Map of the site investigated

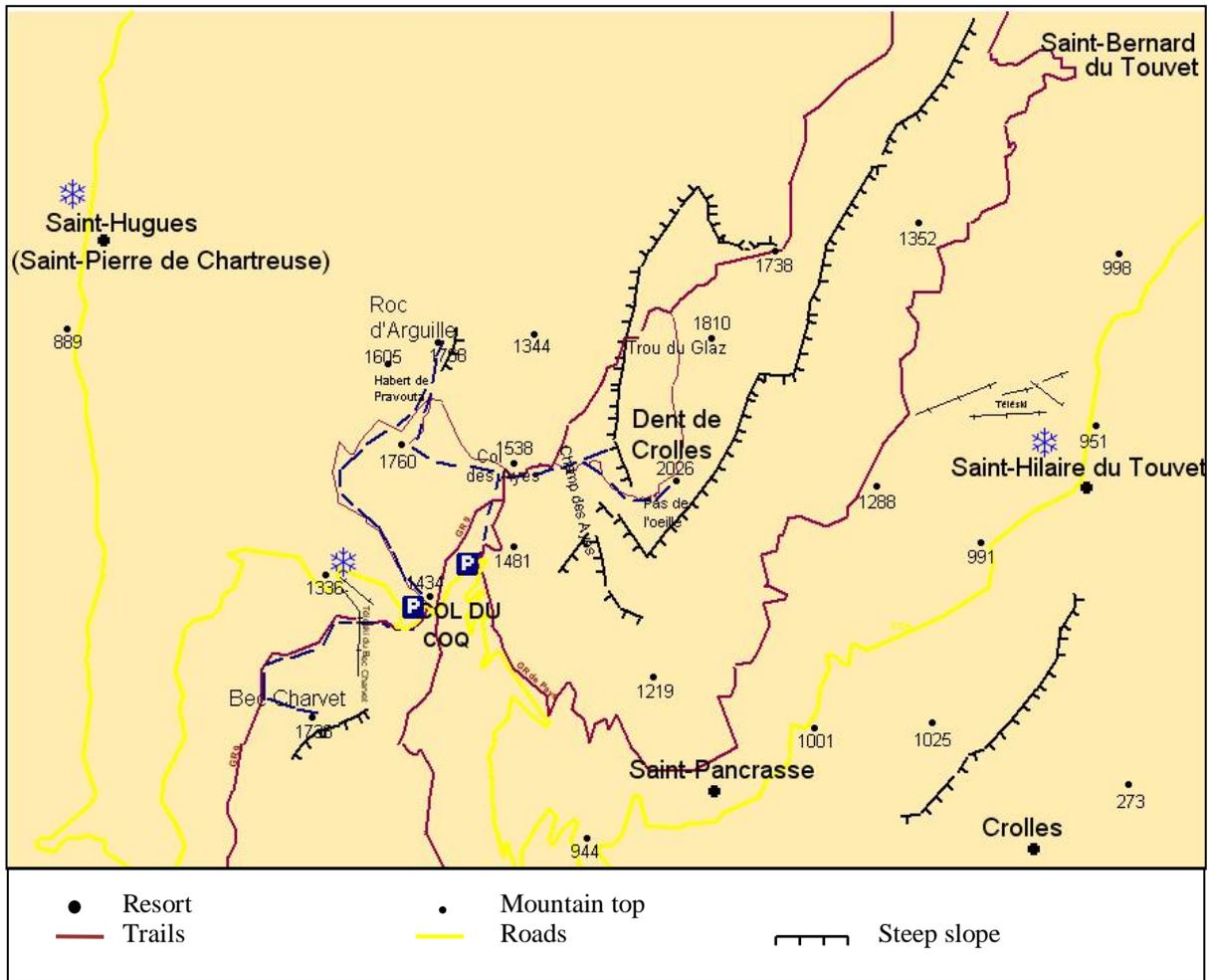


Table 1: Type and number of interviewed actors

Number of interviews	Type of structure	Job titles or activities
Protected area and/or environmental managers (n=6)		
	Natural Regional Park of Chartreuse	Scientific manager
	Natural Regional Park of Chartreuse	Manager of outdoor recreation
	Departmental council	Environmental manager
	Departmental council	Environmental Guide
	Nature Reserve of Chartreuse	Guard
	National Forestry Office	Technicians
Municipal and inter-municipal elected officials (n=5)		
	<i>Saint-Hilaire city</i>	Elected representative
	<i>Saint-Pierre de Chartreuse city</i>	Elected representative
	<i>Saint-Bernard city / PPR community</i>	Elected representative
	<i>Saint-Pancrasse city</i>	Elected representative
	Local council community	Elected representative
Tourist offices (n=2)		
	Tourism office (<i>Saint-Pierre de Chartreuse city</i>)	Director
	Tourism office (<i>Saint-Hilaire city</i>)	Director
Host (n=1)		
	Holiday cottage renter	Director
Recreational activity providers (n=5)		
	Guides company	Mountain guide and ski instructor
	Hiking provider	Independent and journalism
	Hiking office guides	Director
	Paragliding schools	Director
	Paragliding provider	Independent
Sports and recreation associations (n=3)		
	Climbing association	President
	Icare cup Events and association of friends of the <i>col du Coq</i> resort	President
	Hunting association	President
Environmental protection NGO (n=1)		
	Mountain Wilderness	Project manager

Other (n=2)		
	Departmental council	Director of the tourism department
		Farmer

Figure 2: The deployed arguments

