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Hydropower landscapes and tourism development in the Pyrenees

From natural resource to cultural heritage

Jean-François Rodriguez

EDITOR'S NOTE

Translation: Brian Keogh

- 1 Landscapes marked by hydropower development are omnipresent in the Pyrenees. Throughout the entire mountain range, it is rare to find a high valley, on either side of the French-Spanish border, which is not equipped with hydroelectric installations¹. When travelling across these high mountain areas, it is not difficult, with simple observation, to draw up a Prévert-style inventory: dykes, penstocks, surge tanks, pumping stations, but also paths and roads, huts in various states of abandon, pylons, cable-cars, walkways, and underground galleries. These are all elements of a system for exploiting what is considered a natural resource to produce electric power, with the dams being the most emblematic of these installations. To appreciate the extent of this development in the Pyrenees, one only needs to look at the map of hydropower infrastructures published jointly by French and Spanish authorities in 1989 (Figure 1). The map reveals heavy concentrations of equipment on the French side, between the western massifs of the Ossau-Balaïtous and the eastern Carlit massifs and, on the Spanish side, between the western massifs of Collarada and the eastern massifs of the Encantats, in other words, throughout the entire central part of the mountain range, including its highest regions.

Figure 1. Hydroelectric infrastructures in Pyrenees

Accordig to Laborie J.P., Pala J.M., 1989. – Les Pyrénées, présentation d'une montagne transfrontalière. El Pirineo, presentacion de una montaña fronteriza

- 2 If we trace the links between hydropower development in the Pyrenees and the development of mountain tourism and recreational activities, we can gain valuable insights into the emergence during the 20th century of a new tourist resource, that of high mountain hydropower sites. In the context of the current debate on existing or potential relations between territorial resources and tourism development, our aim is to evaluate the links between hydropower landscapes and the different types of mountain tourism. This objective is based on two hypotheses, namely that local development based mainly on a renewable “natural resource” (hydroelectric power) may be enlarged to include an area’s “cultural resource” based on the notion of a “heritagized landscape”² and, second, that there still exists a pervasive imaginary world of high mountain landscapes where any human impact is generally perceived as negative, in that it modifies the aesthetics of the landscape.
- 3 The relations that our societies maintain with Nature are both complex and ambiguous. It is not easy to understand the interrelationships that develop over time between natural mountain environments, the actions of societies that use these environments, and the representations that societies hold in their regard. How have hydropower developments contributed to tourism development in high mountain areas? What values can contemporary touristic representations give to these landscapes? What role can cultural heritage³ play in high mountain landscapes? At a time when the emphasis is on encouraging the sustainable development of regions, is it still necessary to consider local practices in a dialectic opposing Nature and culture?
- 4 The comparative example of the Encantats and Neouvielle massifs that we develop in this study concerns two important hydropower plants situated on either side of the Franco-Spanish border, both of which receive large numbers of visitors. First, an historical approach focuses on the advantages of giving them a heritage value. Then, an analysis of the current situation concerning the impact of these installations on regional development and tourism provides useful insights into the questions raised above.

Hydroelectric power facilities: a cultural heritage in the shadow of the natural heritage

- 5 In the Pyrenees, as is generally the case in all alpine regions, high mountain areas have been significantly marked by hydropower development schemes. High-level dams, clearly visible in the landscape, are the material elements, the “symbolic objects”, which have helped construct the landscape identity of high mountain areas. The infrastructures needed for their construction and operation are just as present in the landscape and, with the dams themselves, make up a coherent whole at the spatial scale of each massif. This reality⁴ clashes with the codes of observation inherited from the 18th century, codes that became well entrenched in collective representations during the 19th century, where the high mountain areas were effectively seen as the archetype of the beautiful natural landscape (Briffaud, 1994). The authenticity and beauty of this landscape were then bound to its status as a “preserved” area, little marked by human activity, if not virgin territory: “Here, Nature ignores, even despises, man: It becomes cosmic, planetary (translation)” (Schrader, 1897). In this respect, according to a symmetry that plays a major structuring role in the social representation of this space, the high mountains are in opposition to the mid-altitude mountains and low valley areas, which everyone accepts have been, and continue to be, inhabited and shaped by man. This dividing line closely matches another, which separates the *picturesque* from the *sublime* in western landscape aesthetics. The high mountains represent the area of the sublime: fascinating, grandiose, extreme and superhuman. During the 20th century, this binary division of mountain space was reinforced by public “heritagization” policies with the creation of Natural Reserves and National Parks, protecting the high altitude “natural” areas⁵. Thus, the heart of the Pyrenees National Park covers “the highland areas above 1000 metres altitude.”⁶.
- 6 It is this discrepancy between people’s perceptions and the reality of what truly is a high mountain landscape that gives rise to conflicting representations and values. They become the common backdrop for actions where there are different issues at stake for the actors involved, whether they be institutions or individuals, local or from outside the area. Thus in 2001, for aesthetic reasons, EDF dismantled the vestiges of the cable car built for the construction site of the Migouélou dam (1956-1958), thereby restoring the so-called “virginity”⁷ of the landscape at the heart of the Pyrenees National Park. In terms of landscape preservation, the National Park is satisfied with “clean-up” operations of this type, while EDF is seen to be “working hard on polishing its image, showing its willingness to preserve the environment (translation)”⁸ at a time when the battle over dam operating concessions is hotting up following the opening up of the market to competition (*Le Monde*, 4 June 2011) and when, in Europe, criticism of nuclear energy is fanning debates and encouraging discussion on renewable energies.
- 7 In this context, mountain tourism plays a fundamental role for two reasons. Firstly, the discovery of the touristic attraction of mountain areas and the history of its landscape representations have, since the 19th century, been closely linked to the history of the exploitation of natural resources and associated developments. Secondly, tourism, which is “often conceived as an industry” (Sacareau, 2011, p.195), gives rise to important economic and societal issues. The different profiles of tourists and the changes in their spatial practices give birth to new landscape representations, both symbolic and social, transforming landscapes of hydropower resources into landscapes

that are more contemplative and spiritual (Métailié et Rodriguez, 2011). This comes from the fact that, in the same way as “tourism invented and reinterpreted the natural resources of mountain areas over time - the landscape, the water, the air, the snow (translation)” (Sacareau, 2011, p. 196), tourism has given, since the mid 20th century, a new meaning to hydropower equipment in high mountain areas, making them a powerful lever for tourism development at the scale of the Pyrenees. Thanks to these facilities and the landscapes, the high mountain areas have become “a tourism resource” (Lévy, Lussault, 2003, p. 798). This change in ways of looking at landscape constitutes somewhat of a paradox: a new form of tourism development, based on these installations, which contradicts the prejudices of representations and attributes a heritage value to hydropower landscapes. A large number of these sites, particularly those equipped with dams, represent, at one and the same time, touristic “places of attachment” that are contributing to the “construction of a collective and individual identity” (Jousseau *et al.*, 2007, p. 7) as well as key elements in the territorial identification and recognition of high mountain landscapes. Thus, in the same way as natural landscapes became “a resource that was continually renewed through the eyes of the tourist (translation)” (Sacareau, 2011, p. 200), the high mountain hydropower facilities, which attract visitors by virtue of both the natural environment in which they are located and the structures themselves, are also becoming, through this reciprocal effect, a new landscape resource simply by the manner in which they are regarded.

- 8 This complex process of changing landscape values in the Pyrenees, constantly subjected to the enduring fantasy of the unspoilt mountain area⁹, takes us to the heart of the spirit or “raison d’être” of heritage (Poulot, 2006). It can be seen as part of the more general public debate on mountain heritage, with its compatibilities and contradictions relating to the adherence, or not, to values that are not always shared by all the actors involved¹⁰. Even though the trend today is toward considering every type of heritage¹¹, the cultural heritage of high mountain areas still finds itself in the shadow of a very widely recognised natural heritage. In the Pyrenees, the cultural heritage of the high mountains is not totally unknown. However, since it has not been the subject of a census or inventory, it is often ignored, if not rejected from a landscape paradigm assimilated to a “concentrate of Nature in its purest form [...] preserved from Man’s domination (translation)” (Métailié, Rodriguez, 2011, p. 213). We find this lack of recognition again in the study published by DATAR and MOPU¹², which presents the Pyrenees Mountains from an institutional point of view and makes no mention of any high mountain cultural heritage, although a substantial chapter is devoted to the natural heritage. However, if we look further than the pro-dam/anti-dam dialectic (Dalmaso, 2008), hydropower landscapes have, thanks to the interest shown in them by a large number of tourists, come to represent an historical revenge for these areas that for so long have been ignored by heritage thinking.

Encantats and Neouvielle: from natural resource to hydropower heritage

- 9 The double example of the Encantats and Neouvielle massifs (Figure 2) illustrates the potential or existing links between natural resources, hydropower resources and tourism development, and the role of landscape heritage values. The two granite

massifs have numerous high mountain lakes of glacial origin that constitute a remarkable natural water reserve. This important natural resource has also been exploited on a massive scale for the production of hydroelectric power. These development schemes represent key moments in the history of hydropower in the Pyrenees. Both these massifs also attract a large number of tourists every year.

Figure 2. Situation of the Encantats and Néouvielle massifs

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Encantats: the beginnings of hydropower development in the Spanish Pyrenees

- 10 The highest part of the Encantats massif (Figure 3), which is situated more or less in the centre of the Pyrenean range, is entirely situated in Spain¹³ owing to an anomaly in the drawing of the border when the Pyrenees Treaty was signed in 1659. Thus, in this area the border diverges from the natural watershed, leaving the Val d'Aran on the Spanish side of the border even though it is on the northern slopes of the mountain range. The Encantats include the upstream part of several hydrological catchment basins, one of which is the Val d'Aran in the north. Situated in the central part of the massif is the National Park of Aiguüestortes and Sant Maurici¹⁴, straddling the Val d'Aran in the north, the regions of Pallars Sobirà to the east, the Upper Ribagorça to the west, and Pallars Jussà to the south. These regions are respectively crossed by the Garonne and the Noguera Pallaresa rivers, the Noguera Ribagorçana (Vall de Barravés) with its tributaries Noguera de Tor and rio de Sant Nicolau (Vall de Boí), and Flamisell (Vall Fosca). These rivers have their sources in the heart of the Encantats and have several major hydroelectric power schemes corresponding to two intense periods of activity in the history of Spanish hydropower development.

Figure 3. Map of the Encantats massif

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- 11 At the end of the 19th century and the beginning of the 20th century, the development of hydropower in Spain relied on investment by a multitude of private electricity companies. Development was limited by the impossibility of transmitting electricity produced as DC over long distances. Consequently, the power grid was marginal since electricity production plants had to be located close to the industries using the energy produced. Technological progress, and particularly the use of alternators transforming DC into AC current, marked a major change at the beginning of the 20th century, making it possible to transmit power over long distances, so that power no longer had to be consumed close to where it was generated. It was from this moment that natural water resources could be exploited in high mountain areas, thereby transforming “natural” landscapes into “industrial” landscapes in a most striking manner.
- 12 The first Spanish hydropower plant in the Pyrenees was commissioned in June 1914 in Capdella, in the Vall Fosca, by Energía Eléctrica de Cataluña (EEC)¹⁵ to supply power to Barcelona, some 200km from there. The plant harnesses power from the water resources of the lake basin of Estany Gento¹⁶, which includes the Colomina and Tort lakes, situated at an altitude of more 2'100 metres upstream of the Flamisell River. Foreign technical expertise provided by engineers from the French Compagnie Générale d'Électricité de Paris (CGE) and the Swiss Société Suisse d'Industries Électriques (SSIE) made this plant one of the most modern hydropower installations in Europe for its time, with a head of 800 metres. The construction site was enormous and had a significant impact on the landscape, both at the site itself and upstream in the high mountain areas where the water level in the natural lakes was raised by gravity dams that were interconnected by a vast network of underground galleries (Figure 4). Provisions were brought to the construction site by a specially constructed transport system, comprising two funicular railways and the *Carrilet*, a small wagon train, which

followed the 2'140 metre contour over a distance of some 5 km. Today it is in a state of abandonment.

Figure 4. Estany Gento: Dam and lake, with fishermen

Old postcard

- 13 The Civil War¹⁷ brought electricity production and distribution to a halt. In the post-war years, an already difficult situation in Spain became even worse with the drought of 1944 and 1945. As Spain was beginning to recover from the war, and the demand for power was increasing by 27% per year, restrictions on energy consumption were then introduced, thus curbing the resurgent economic and industrial development. It was then that the Spanish state, under Franco, employed substantial institutional and political means in creating two powerful spatial planning and development tools: the INI (Instituto Nacional de Industria, 1941), whose mission was to stimulate development of the stagnant industrial sector nationwide and to finally make the country's economy independent; the ENHER (Empresa Nacional Hidroeléctrica del Ribagorza, 1946)¹⁸, to exploit the hitherto untapped hydropower resources of the Upper Ribagorza (Vall de Barravés and Vall de Boí).
- 14 This ambitious project concerned the whole of the Upper Ribagorza including the high mountain areas, the lower valleys and the lowland areas in a general regional development plan based on the exploitation of the natural water resources. Its objective was to control all the stages, from the actual exploitation of the resource, with the installation of all the infrastructures needed, to the transmission and distribution of electricity via connections with the regional, inter-regional and international networks. The work was scheduled over a long period of 12 years, from 1947 to 1958, and covered the construction of the dams, roads, and communication and access tracks to the different construction sites. To speed up work, an enormous concrete mixing plant, "Pirineo", was built in the little village of Xerallo, situated at the limit of the Upper Ribagorza and Pallars Sobirà. With the construction of new buildings to house employees and the offices of the ENHER, the village of Pont de Suert grew into

a small mountain town, becoming the “hydropower capital of the Ribagorza” (Enriquez de Salamanca, 1995).

Neouvielle: an expression of progress and control over Nature

- 15 The Neouvielle massif (Figure 5) is situated in the Hautes-Pyrénées department and is delimited by the valleys of the Aure to the south and the east, the Barèges valley to the north, and the Gèdre-Gavarnie valley to the west. It is part of the hydrological basins of the Neste d'Aure¹⁹ (tributary of the Garonne) and the Gave de Pau²⁰ (tributary of the Adour). It includes part of the eastern zone of the National Park of the Pyrenees and the Natural Reserve of Neouvielle.

Figure 5. Map of Neouvielle Mountains

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- 16 In France, hydroelectricity development in the Pyrenees also began in the late 19th and early 20th centuries, with the arrival of what some referred to as “white coal”. In certain respects, the situation is comparable to that of Spain: the concessions for exploiting the hydropower resources were allocated to private companies in a context of free spatial competition. For France, the fundamental difference came from the creation of EDF (Électricité de France) with the Act of April 8, 1946 which nationalized the generation, transmission and distribution of electricity, thereby bringing to an end any monopolistic desires of private companies in the field of energy production, particularly hydropower production.
- 17 From 1947, major hydropower projects began with a view to providing the country with a substantial capacity in energy generation to meet the French population’s growing demand for electrical energy. This resulted in the 1950s becoming “a pivotal period in the history of the industrialisation of the high mountain areas of the Pyrenees (translation)” (Métailié et Rodriguez, 2011). At this time, the Neouvielle massif was at the forefront of progress when EDF built the Cap-de-Long dam, located at an altitude of 2’160 metres, and commissioned the Pragnères power plant in 1954. Like the dam at

Tignes in the Alps (commissioned in 1952), the vast construction site and the modernity of the operation made Cap-de-Long – Pragnères one of the nation's flagship projects of that time, both in terms of hydropower production and expertise in energy engineering and civil engineering works (Figure 6).

Figure 6. Cap-de-Long: Dam construction site with infrastructure

SOURCE: EDF (SEE BIBLIOGRAPHY)

- 18 It took seven years to complete work on the construction sites for the infrastructures of the Pragnères plant: “three years to build the 12 kilometres of road leading to the site of the dam, one year to set up the construction site with its housing, its own concrete plant... and three more years to build the dam itself and the ten kilometres of underground galleries dug into the mountain (translation)” (Métailié, Rodriguez, 2011, p. 218). Apart from the sheer size of this installation, its particularity comes from the Promethean attitude of the EDF engineers who, when implementing this project, shifted the watershed between the Ardour and Garonne catchment basins towards the east. The Cap-de-Long dam and part of the lake system that feeds it are situated in the Nestes catchment basin, the rest of the water being pumped back by two pumping stations from the Gaves catchment basin to Cap-de-Long, after first passing through the turbines of the Pragnères plant (situated on the edge of the Gave de Pau). All this water is then channelled via an underground gallery and a penstock with a 1'250-metre drop to the Pragnères plant before being discharged into the Gave de Pau (Figure 7). Thus, the water captured in the upstream part of the Garonne catchment basin is no longer returned to its natural basin.

Figure 7. Pragnères hydroelectric: schematic profile of operation

Source EDF (see bibliography)

Hydroelectricity: supporting territorial and tourism development

- 19 Today, the regional identity of the Encantats and Neouvielle massifs is based on the hiking activities practiced in this exceptional landscape and environment, much of which has been designated a National Park or Natural Reserve. The area is a very popular tourist destination, each massif receiving hundreds of thousands of summer visitors. This tourism development has been helped considerably by the hydropower infrastructures, which have made the high mountain areas accessible to everyone, including by motorists. Thus today's popularity of the Encantats and Neouvielle massifs with tourists is largely thanks to the combination of a preserved natural heritage and easy access.
- 20 This popularity with visitors was not envisaged when work began on hydropower development and it soon led to problems of pollution and other environmental degradation (waste, trampling of certain mountain grasslands, erosion). In both massifs, the National Park and the communes that owned the land had to take measures, with the backing of public authorities, to manage visitor numbers in order to protect the environment. These measures involved the introduction of special regulations to control automobile traffic and parking. Pay car parks and shuttle services to take visitors to the heart of the sensitive areas helped limit pollution and contributed, albeit in a modest way, to local economic and social development.
- 21 However, although the natural environment is the main tourist attraction, it is not the only one. The hydropower structures themselves, particularly the dams, are a source of

admiration for tourists simply by virtue of the sheer size of the installations, the reasons for their existence, and the human values they represent in terms of the risks taken and the efforts made to realise such a project. This is the case for Cap-de-Long, where today's visitors come to contemplate the dam and the lake, just as in the past they might have admired the waterfalls or the seracs in the glaciers. A great many tourists visit the Pragnères power plant every year – although EDF believes there could be even more given the numbers attracted to the massif – and this bears witness to this perspective, which was not at all imagined when the hydropower project was conceived. Tourists are thus interested just as much in the *natural* landscape as in the cultural heritage, an interest that has given new life to the resource by recognising the existence of an industrial heritage in these high mountains.

- 22 In the Upper Ribagorza, roads and tracks used to be rare. The Boí valley was for a long time isolated and little known, even at the beginning of the 20th century. The road built by ENHER for the construction of the Cavallers dam, situated upstream of the valley, today facilitates visitor access to the national park of Aiguestortes and Sant Maurici. But, above all, it has provided an opportunity to open up the entire valley and its string of small villages. From a touristic point of view, improved access has enabled visitors to discover a Roman architecture specific to this valley and unique in the world, which until then was only known to a few specialists. The 12th century church of Sant Climent de Taüll, built in a Lombardo-Catalan style, is perhaps the most emblematic representation of this architecture (Figure 8). Exploitation of the natural resources of this high mountain area thus promoted the development of two different types of tourism, one based on hiking and the practice of mountain sports in an aesthetic natural area of mountain summits, the other more interested in discovering and appreciating the cultural heritage of the lower part of the valley.

Figure 8. Church of Sant Climent of Taüll. XIIth century. Exterior view

PHOTO: MICHEL WAL, 2007

- 23 In the Neouvielle massif, apart from the dams, the underground galleries and the Cap-de-Long road, almost all the infrastructures required for the construction works have today disappeared, often having been dismantled by EDF. In the Encantats, however, the situation is not the same. The cable car, which was built in 1981 for work on the new Sallente-Gento power plant, replaced the old system of two funicular railways and the Carrilet (little train), which had become obsolete and unsuitable. It was opened to the public in the summer of 1991 and enables hikers and family groups out for a summer walk to climb the 384 metres between estany (lake) Sallente and estany Gento without any special equipment or physical effort, reaching the high mountain areas in only a few minutes. In the context of this evolution in mountain tourism practices, the old Carrilet represents the materialisation of the complex and ambiguous relationship with these different developments in the landscape. Recognised for its historical heritage value, and preserved in memory of the hydropower development scheme that took place at the beginning of the 20th century, it is today somewhat of a paradox, reconverted into the “Vía verde de la Vall Fosca”, a very easy mountain hike that can be accessed directly with the new cable car (Figure 9).

Figure 9. Old Carrilet (Estany Gento): the old railway track has become an easy hiking path for everyone.

Photo Roc Garcia – Elias Cos, 2010

- 24 Similarly, in the Encantats massif, some of the buildings built in the mountains during hydropower development works have also been preserved, rehabilitated to provide refuges that are part of a network enabling hikers to spend several days going round the massif. The refuge at Colomina, situated at an altitude of 2'400 metres on the edge of the Aigüestortes and Sant Maurici National Park, is a case in point. Made of wood, it has a typical alpine architecture and was built by the Swiss engineer, Keller, in 1917 and housed him while he was directing works in this sector of the mountains. For a long time known as the *Chalet Keller*, it was restored in 1985 by the FEEC²¹, and is part of a network of accommodation for hikers along with the other mountain refuges, a certain number of which were also built during the period of hydropower construction work. The network is a major asset for tourism development, making the Encantats massif a benchmark in this respect.
- 25 Today, in light of the success of its tourism development based on hiking, the Encantats massif serves as a model for Neouvielle within the framework of a plan to develop and promote it via a PER project entitled *Néouvielle destination nature*²². This plan is founded essentially on a programme to set up a network of mountain refuges to facilitate hiking around the massif. The project brings together the locally elected representatives of the valleys of the Gaves and Nestes, the department and the region, as well as mountain clubs, various associations of mountain users and professionals, and the Pyrenees National Park (responsible for the management of the Natural Reserve of Neouvielle). The stated objective is to promote sustainable tourism, by both preserving the environment and developing the massif as a whole.

Conclusion

- 26 As well as the interest aroused by the dams and reservoirs themselves, it is clear from the examples presented in this paper that the ancillary infrastructures, essential for the implementation of the hydroelectric development works, have since the beginning of the 20th century been one of the main vectors of tourism development in mountain valleys. Most of these infrastructures are still used today, illustrating a “durability” not at all envisaged by the engineers of the time. The roads have become major links for tourist flows and worksite housing has been converted into mountain refuges or chalet-hotels offering accommodation to numerous hikers. This has often given rise to a type of high mountain mass tourism, with such accommodation providing the logistical support that is indispensable in this respect. At the same time, the infrastructures have become a means to change the way in which high mountain landscapes are regarded and are testament to the close links that exist between the exploitation of natural resources and tourism development.
- 27 The comparison of the Encantats and Neouvielle massifs also provides us with valuable insights into possible heritage issues in the future, from a number of different perspectives: the ongoing renewal of hydropower resources, new landscape concerns (European Landscape Convention), and the necessary diversification of mountain tourism development. Through the prism of two different heritage attitudes, the comparison provides us with the opportunity to examine new ways of managing mountain regions that could be explored in the future. These have already been tried to a certain extent – this is the case in Spain – by integrating the principle of preserving natural areas and the “re-functionalisation” of certain elements of hydropower heritage in a global and coherent spatial vision, taking into account the hybridity of the origin of social actions in this area and of their imprint on the landscape. One of the most emblematic means of promoting this cultural heritage is the hydroelectricity museum in Capdella²³. Set up in a part of the power plant itself, it is also based on the idea of “recycling” by attributing new uses to former industrial facilities. The project was begun by an association of engineers and was then taken up by the public authorities under the auspices of the Generalitat de Catalunya (Government of Catalonia)²⁴. It goes beyond the simple concept of “museumification”, its aim being to enhance knowledge about hydropower exploitation methods and the production process in a world context of energy transition and the development of mountain regions in a manner compatible with the cultural expectations of modern society.

BIBLIOGRAPHY

BEZAT J.M., 4 juin 2011.– « La guerre pour l’exploitation des barrages a commencé. Le gouvernement veut renouveler les concessions de dix vallées d’ici à la fin 2015. EDF fait face à plusieurs rivaux », *Le Monde*.

- BRIFFAUD S., 1994.– *Naissance d'un paysage. La montagne pyrénéenne à la croisée des regards. XVI^e-XIX^e siècles*, Association Guillaume Mauran (Archives Départementales des Hautes-Pyrénées) et CIMA-UTM.
- CORBIN A., 2001.– *L'homme dans le paysage*, Textuel.
- DALMASSO A., 2008.– « Barrages et développement dans les Alpes françaises de l'entre-deux-guerres », *Revue de géographie alpine/Journal of Alpine Research*, 96-1, mis en ligne le 03 mars 2009, pp. 45-54.
- ÉLECTRICITÉ DE FRANCE, 1956.– *Pragnères*, EDF Région Équipement Pyrénées-Atlantiques.
- ENRIQUEZ DE SALAMANCA C., 1995. – *Por el Pirineo catalan (valle de arán y parque nacional de aiçües tortes)*, Cayetano Enriquez de Salamanca, Madrid.
- GUERRIER P., 26 juillet 2001.– « La montagne retrouve sa virginité. Hautes-Pyrénées : EDF démolit le téléphérique de Migouélou », *La Dépêche du Midi des Hautes-Pyrénées*.
- JOUSSEAUME V., DAVID O., DELFOSSE C., 2007.– « Éditorial. Patrimoine, culture et construction identitaire dans les territoires ruraux ». *Noréis*, 204, mis en ligne le 1^{er} septembre 2009.
- LABORIE J.P., PALA J.M., 1989.– *Les Pyrénées, présentation d'une montagne transfrontalière. El Pirineo, presentacion de una montaña fronteriza*, DATAR et Centro de Publicaciones MOPU, Madrid.
- LÉVY J., LUSSAULT M., 2003.– *Dictionnaire de la géographie et de l'espace des sociétés*. Belin.
- MARCOS FANO J.M., 2002.– « Historia y panorama actual del sistema eléctrico español ». *Física y Sociedad, Revista del Colegio Oficial de Físicos*, n°13, pp. 10-17.
- MÉTAILLÉ J.P., RODRIGUEZ J.F., 2011.– « Du paysage de la ressource au paysage du ressourcement », in Antoine J.M., Millian J. (dir.), *La ressource montagne. Entre potentialités et contraintes*, Paris, L'Harmattan, pp. 213-230.
- POULOT D., 2006.– « De la raison patrimoniale aux mondes du patrimoine », *Socio-anthropologie*, n°19, mis en ligne le 31 octobre 2007.
- SACAREAU I., 2011.– « Lorsque les pratiques touristiques renouvellent la ressource », in Antoine J.M., Millian J. (dir.) *La ressource montagne. Entre potentialités et contraintes*, Paris, L'Harmattan, pp. 195-211.
- SCHRADER F., 1998.– *À quoi tient la beauté des montagnes*, Conférence faite au Club Alpin, le 25 novembre 1897 à Paris, Pin à Crochets.

NOTES

1. The upper Cauterets valley (Hautes-Pyrénées) is one of the very rare French valleys in the Pyrenees that has been “spared” from hydropower developments.
2. By “heritagized landscape”, we mean those landscapes considered remarkable and protected by statute, such as National Parks, Regional Natural Parks, Natural Reserves, Listed Sites.
3. Here we attribute a double dimension to the notion of cultural heritage, in that it is both shaped by societies and experienced and perceived by them.
4. The notion of landscape comprises a double dimension of *idea* and *reality*. The first relates to the field of social representations, the second to the actual material existence of the elements that make up the landscape. In the high mountains, the hydropower infrastructures are, through their presence, part of this material reality.

5. The central zones of the national parks in the Pyrenees, whether in France or Spain, are situated in the high mountains. Only the peripheral zones include mid-altitude areas.
6. Official site of Pyrenees National Park : www.parc-pyrenees.com
7. *La Dépêche du Midi* des Hautes-Pyrénées, 26 July 2001.
8. *Ibid.*
9. One of the slogans of the National Parks of France is: “Terre sauvage – Vivre la nature!”
10. National Parks, elected representatives of mountain areas, tourism associations, mountain and/or environmental protection associations.
11. Thus, “to know the area’s heritage in terms of landscape and the cultural and natural environment and to preserve the fauna, flora, habitats and cultural heritage” is today one of the essential missions of the Pyrenees National Park (cf. Official site of Pyrenees National Park: www.parc-pyrenees.com, /missions).
12. See bibliography: LABORIE J.P., PALA J.M., 1989. – *Les Pyrénées, présentation d’une montagne transfrontalière*. DATAR : Délégation interministérielle à l’aménagement du territoire et à l’action régionale ; MOPU : Ministerio de obras publicas y urbanismo.
13. This massif is entirely situated in Catalonia near the border with Aragon, where the Noguera Ribagorçana River divides the two provinces.
14. Based on the “Parques Naturales” Act of 1916, it was created by decree on 21 October 1955, in the middle of the period of hydropower development in the Encantats massif and the surrounding valleys.
15. Energía Eléctrica de Cataluña, a private company set up in 1911. Most of the capital was foreign, from the French Compagnie Générale d’Électricité de Paris (CGE) and the Swiss Société Suisse d’Industries Électriques (SSIE).
16. *Estany*: a Catalan term meaning “lake”.
17. Here we are speaking about the Spanish Civil War.
18. A public limited-liability company set up at the initiative of the INI, the capital for which was mostly public when it was created (from INI). It was therefore a private sector business but its management was highly dependent on the public sector.
19. Neste: very local term, synonymous with “torrent” and “river”, used in the Aure valley (Bigorre). Thus there are several “nestes”: Neste de Couplan, Neste de Louron, Neste d’Aure...
20. Gave: local term, synonymous with “torrent” and “river”, used more widely than “neste”, particularly in Béarn and in a part of the Bigorre. Here there are several “gaves”: Gave de Pau, Gave de Cauterets, Gave d’Oloron...
21. FEEC : Federació d’Entitats Excursionistes de Catalunya.
22. PER : Pôle d’excellence rurale. Agreement signed between the Association de valorisation du massif du Néouvielle and the State, on 14 March 2012, in Vielle-Aure (Hautes-Pyrénées).
23. Museu Hydroelèctric de Capdella. It should be remembered that Capdella is the where the first hydropower plant in the Spanish Pyrenees was built.
24. Political organisation of the Autonomous Community of Catalonia.

ABSTRACTS

Since the development of hydroelectric power at the end of the 19th century, most of the high mountain valleys in the Pyrenees have been equipped with hydropower facilities (dams, water

intake structures, aqueducts, penstocks, access routes, etc.). Thus, today many landscapes in the Pyrenees bear witness to the exploitation of this renewable resource. But in the classical imaginary world, these mountain areas are seen as the archetype of the beautiful natural landscape, in accordance with aesthetic values inherited from the 18th century, setting Man against Nature. In this model of representations, the cultural heritage of high mountain areas remains in the shadow of their natural heritage. However, since the beginning of the 20th century, it can be shown that the development of mountain tourism has been closely linked with the development of hydroelectric power infrastructures. This runs counter to these prejudices and may well give rise to new ways of looking at these hybrid landscapes.

The cross-border comparison of the Neouvielle and Encantats massifs in the Pyrenees reveals that their hydropower resources are exploited in the same way, but that heritage aspects are managed differently: dismantling of ancillary installations at the dams with a view to protecting the so-called “natural” landscapes in the Neouvielle massif, as opposed to rehabilitating and converting this heritage in the Encantats massifs with a view to developing a form of tourism that takes into account the hybrid nature of the vestiges visible in today’s landscape.

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