

Abstracts in English

I.

Landscape, water and planning

In the right place at the right time: water in human landscapes

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Water is physically central to life itself and a basic part of sustainable development. Alongside land (earth) and air it represents one of three of the four ancient elements. This essay concentrates, however, on water's cultural, symbolic and social significance, which encompasses aspects such as imagination, spirit, mentality, creativity and human ambition, and which might also be said to represent 'fire', the fourth element.

Far from being solely an environmental matter, water thus carries symbolic value. Its human, cultural, and even spiritual aspects are just as important (if less literally so) as its physical ones. According to 21st century definitions of landscape (as in the European Landscape Convention), we can give such values the name of 'landscape'. Thinking and acting about landscape helps people make sense of the world around them, and 'landscape' thereby becomes an important interdisciplinary and integrating mechanism for addressing pressing global challenges and guiding change. The idea of landscape that enables this is not based on notions such as beauty (or at least not exclusively), but on broader, older and more instrumental ideas of landscape as a forum for collective, communal human decision-making and action.

Water is one of the resources that is in most urgent need of cooperation and collective action. It is ignorant of human boundaries. It does not exist everywhere in equal measure: in parts of Europe there are problems with water scarcity, while elsewhere there is too much water. These extremes hide the universal truth that society needs its water to be in the right place at the right time. The struggle to achieve this, and to manage water in the wrong place, has been endless, leaving many traces in the landscape and heritage, and providing a case study in using ways of thinking about landscape as a tool.

Flowing together: reconnecting landscape to heritage

The idea that landscape is a tool or process, as opposed to an object, is becoming increasingly common, and is also connected to new ideas of heritage as a process. For a long time, landscape and heritage were treated as quite separate and different things, but definitions have changed markedly over the past few decades. Heritage's contribution to landscape is now widely recognised, as is the idea that landscape is also heritage. The two concepts do in fact converge. Indeed, there are so many similarities between Landscape and Heritage (and *paisatge* and *patrimoni*) that one wonders whether the distinction was ever anything more than a matter of different labels drawn from the specialist terminology or jargon used by different academic sectors to describe what is essentially the same thing. The public have their own words ('countryside', for example) and other expert communities use different jargon (e.g. 'ecosystem services', biodiversity, 'environment' and 'territory'). But in instrumental terms, they are all referring to much the same thing; the ways in which people see the world and act within it.

One European project, CHerIScape ('Cultural Heritage in Landscape', in the European 'Joint Programming Initiative (JPI) on cultural heritage) is exploring this convergence between landscape and heritage (<http://www.cheriscap.eu>). Increasingly, the distinction between landscape and heritage is abating, partly because of the European Landscape Convention and the Faro Convention, but also because interdisciplinary integration is needed when problems and challenges arise which (like water and landscape) respect disciplinary frontiers no more than they respect national borders. Comprehensive problems need holistic solutions, as has long been known by river managers. At the same time, there has been growing recognition that expert opinion needs to be framed within greater democracy and inclusivity. A more forward-looking engagement with change has also been adopted, recognising it as a characteristic of landscape rather than a threat.

Disciplinary and practical divisions are thus being reduced in a way which is akin to the bridging of a river or the reconnecting of two sides of an estuary. Bridges, in fact, provide a useful landscape metaphor. Bridges are potent symbols of unity and harmony, of ingenuity and persistence. A sign of progress and growth, well-being and harmony, their destruction (either by nature or humankind) signifies chaos, disruption, separation and exclusion on the one hand, and eventual reunion through the rebuilding process on the other. But whereas bridges tend to be the result of cooperation, agreement, fusion and collectivity, the other big feats of engineering inspired by water – such as dams and barrages – often attract more opposition than support, causing fission rather than fusion, blocking the natural flow of water, and taking from one community to help

another. In short, barrages are external impositions on the landscape which divide instead of connecting.

Agency and symbolism: the landscape attributes of water

Water is rarely absent from the landscape, and the heritage of water is wide-ranging and diverse. Water thus contributes to the landscape in many ways; firstly, through its movement, its flow, its rhythms and cycles which complement those of the landscape. The movement of water has physically shaped the surface of the land and facilitates human movement through landscape. It has also shaped human mentality and actions: rivers draw us downstream to the sea and we look 'upstream' for beginnings. The simple presence (or absence) of water is a locational factor in our use of the landscape: water helps to create 'place'.

When in motion, water offers kinetic power that has contributed to making distinctive landscapes in Europe for at least two thousand years, including the radical realignment of water drainage systems. In pre-carbon times, even quite small rivers powered many water-wheels, requiring complex structures of governance to regulate the use of water, underpinned by much older definitions of landscape. Through 'locational inertia', water mills determined the location of subsequent industrial activity and even present day enterprises.

Water is symbolically important and has been the focus of landscape paintings since the late middle ages, whether in 'wild' or 'tamed' representations, or in terms of signifying Nature or Commerce. A sub-genre of landscape painting in the 18th and 19th centuries focused on the water mill and its industrial successors; scenes of the river Thames in London teeming with ships were reminders and symbols of Empire and global connections. One of the most powerful images related to global warming is a waterscape, or more precisely a sub-seascape, depicting the symbolic cabinet meeting of the Maldives government held underwater in 2009, which effectively highlighted landscape as governance.

Governance and community, the essence of water in landscape

The insights of the European Landscape Convention and the implications of the Faro Convention for human rights and responsibilities concerning heritage as a universal common good offer reflections on the history of the human sharing of water resources. The centuries-old customary courts of Murcia and Valencia are now rare examples of what must have once been a widespread practice. Similar organisations or courts existed throughout medieval Europe, managing the sharing of agricultural land, common woodland and grazing, as well as water. In dry regions they would also have managed irrigation and in northern Europe they controlled shared water

meadows. The business of moving water away from the 'wrong' place was also usually a communal activity. When communal systems of regulation like this break down, environmental pressures (notably the reassertion of natural drainage systems) start to increase; therefore we worry that environmental change threatens the landscape, but ending a landscape approach to managing the land threatens the environment even more.

Managing and sharing land and resources through communal and collective organisations as well as continual democratic debate and (dis)agreement, is central to the oldest conceptions of landscape which Kenneth Olwig called the substantive nature of landscape. Landscape is first a matter of community, and first and foremost about people. We need to speak more about landscape and heritage as part of *cultural* sustainability. Through the lens of landscape, problems caused by humans may turn out to have social and cultural solutions. The Netherlands, for example, is experiencing a semantic and rhetorical shift from a long-entrenched defensive attitude to water - characterised by its high dykes and drainage pumps - which has shaped the national character as much as it has the nation's lands, to a new approach: '*Ruimte voor de rivier*': '(make) room for the river', 'let the water through'. While still relying on hard engineering solutions, the aim is different; to re-engineer the rivers and not the land, so that water from the Rhine can escape to the sea faster. Its success depends, however, on a cultural and social consensus; a 21st century version of the Valencian and Murcian tribunals on a national scale and a version of the substantive nature of landscape. Conversely, a lack of consensus and landscape thinking has hampered responses to climate and sea level changes in Britain. There, coastal managed retreat projects in the east and responses to flooding in the west (both very definitely a case of water in the wrong place at the wrong time) have demonstrated a critical absence of landscape ways of seeing and planning and, instead, a politicisation and polarisation of the issue.

Conclusion

Water becomes a symbol for landscape itself if we adopt an idea (and a reality) of 'landscape' that goes beyond visual, aesthetic and even character-based definitions and becomes (re-becomes?) a bringing-together of people, places and the environment; an integration of human and natural processes that can connect the past to the future and support equitable democracy. Water management also requires interdisciplinary co-operation and democratic participation in exactly the same way as landscape and heritage, if sustainable solutions are to be found by 'thinking' landscape. 'Thinking landscape' offers the potential (in a way that ecosystem services do not) for finding cultural and social solutions to the world's humanly-induced socio-environmental

challenges from climate change responses to social equity, from population pressure to inequality. Reflecting on water, landscape and heritage turns our gaze first and foremost to people and society, rather than to nature or the environment. Water offers an analogy too: just as small streams grow to become rivers, we find that when we address 'small' problems (such as protecting heritage, managing rivers, conserving cultural landscapes) in a landscape way we are led towards solutions and visions for much bigger, more fundamental challenges.

Landscape planning in an aged-old new polder landscape in the "green heart" of Holland: The case of Midden-Delfland

Bas Pedroli, Stijn Koole and Rob Schröder

The Delfland area is part of the metropolitan conurbation of Holland in the western part of the Netherlands. It is a polder area, i.e. an area where peat bogs have been reclaimed ever since the Middle Ages, and where a meadow landscape has gradually developed with high groundwater levels which are drained with the help of windmills. Dating back to approximately the tenth century AD, these reclamation activities using long narrow canals resulted in a valuable historic landscape which is still visible today, consisting of low-lying tracts of land enclosed by dikes and ring canals. The city culture that developed in this area in the 15th and 16th century was partly based on the specialised dairy farming that evolved on the soft and wet peat soils which were not suitable for cultivating any kind of crops. In the meantime, famous cheeses like Gouda were developed, thanks to the dominance of wet meadowlands in the landscape.

Today the area is situated below sea level, just like most of the rest of densely populated Holland. Although a practice related to day-to-day survival, drainage is so well organised that today's inhabitants are hardly aware of it. Water management is associated more with suitable groundwater levels for agriculture and nature. Delfland is still a relatively open landscape, thanks to the land reform and consolidation laws that prevented new urban developments in the 20th century. It is connected to the Green Heart of Holland in the centre of the Randstad metropolitan ring city, comprising about 7 million inhabitants. Land pressure is nevertheless considerable.

Around 2005, the municipality of Midden-Delfland (about 18,000 inhabitants, 6,500 ha, 1.5 million visitors per year), located between the cities of Rotterdam, Delft and The Hague faced the challenge of developing a strong landscape policy, incorporating water management, nature protection, heritage

conservation, and many other local and regional interests, including a total of more than 60 stakeholders. This paper describes the process leading to this landscape policy and draws lessons from it.

The challenge of developing a shared landscape development plan

Although the Netherlands ratified the European Landscape Convention in 2004, they did not translate this convention into a national landscape law. Since 2010, a strong policy of deregulation and decentralisation has existed at a national level in the Netherlands, in which many responsibilities on spatial planning, nature and landscape policy have been transferred from national to regional and local governments. A 'Landscape Plan' is a voluntary planning instrument used by municipalities. As a starting point for the landscape plan, a Strategic Vision had already been developed for the wider Delfland area: the 'Gebiedsvisie Midden-Delfland@ 2025', identifying the area as the 'Courtyard of Delfland' and focussing on quality of life and a sound investment climate. A strategic vision with six strategic directions and a roadmap for the future was drawn up in close collaboration with the municipalities in the area (especially the big cities), the competent water authority (Water Board Delfland), the province and other interest groups.

The initiative to draw up a local landscape plan was taken by the municipal council of Midden-Delfland. A decision was taken not to restrict it to the municipal boundaries, but to take relationships with the surrounding 5 municipalities explicitly into consideration, in a highly interactive process involving all relevant stakeholders, including citizens and local entrepreneurs.

Agreed boundary conditions for the Midden-Delfland Local Landscape Plan

The process towards a Midden-Delfland Local Landscape Plan ("Perspective 2025") envisioned challenges in various current trends and future developments in and around the area. These expectations, shared in interactive workshops, led to the following boundary conditions for the landscape plan:

- Dairy farming should keep a strong position, while enhancing especially wide views and cows in the meadow (as characteristic of peat meadows), and also guaranteeing space for multifunctional agriculture.
- The ecological and hydrological quality of the 'city garden of the metropolis' (Rotterdam – The Hague) should be improved as a distinctive feature of the location, including a robust water system (water retention) and preservation of historical civil engineering structures.
- Reciprocity in the city and countryside partnership should be made operational.

- The various uses of the area (agriculture, recreation, nature, and housing) should contribute to the landscape character of the municipality.
- The various historical layers of the landscape should become visible in today's landscape.

Development process of the local landscape plan

The landscape plan was developed in the years 2007 – 2010, with the process including many consultations in various working forms. A bottom-up strategy using the age-old polder arrangement of Midden-Delfland emerged as a logical basis. A decision was taken to use 19 polder units – not always managed today as independent hydrological units, but still identifiable on the map – as basic units to define the spatial quality and the development direction with the stakeholders involved. These polders are not only physical water management units, but also appear to represent specific landscapes to which the inhabitants attribute a sense of belonging.

At the end of the process a synthesis map of the main functions of the total area was produced, and described in more detail later in developments per landscape unit (here: polder). This synthesis map gives the main functions and symbols of spatial interventions on location.

The objectives of the landscape plan are all based on a reinforcement of the 'basic qualities' of the Midden-Delfland area: open space, robust water system, nature, heritage and agricultural identity. The objectives are translated into the following guidelines:

- Reinforce the city/countryside contrast: keep the green space open and silent.
- Improve relations with the wider surroundings: create ecological connections with other open areas and rivers for animal species, and 'green bridges' over big traffic roads which are a barrier for recreational traffic.
- Cherish the relations with the nearby surroundings: connection to the surrounding urban areas by 'green fingers' into the city and 'portals' between city and countryside.
- Improve the identity and quality of the borders between urban and rural areas.
- Zoning of recreational areas from intensive zones near the city to extensive and individual zones in the green, mainly agricultural core.
- Protect the open landscape and the meadow birds in the agricultural core area (with the help of farmers) and stimulate the diversity of farming systems.
- Make better use of the recreational qualities of the landscape and the water. Stimulate small-scale private tourist facilities.

Actions and measures envisaged

The Perspective 2025 is an action map and gives an overview of physical actions and measures. Apart from the overview map, the perspective includes design principles for future spatial developments

and maps with networks (or connections) related to ecology, water, public transport, walking, cycling and horse-riding. These actions were developed for the 19 'polders' in extremely detailed maps with functions (such as agriculture, nature, water, recreation, and buildings), borders (between city and countryside) and connections. These maps per polder give a detailed description of the desired spatial quality and future developments and measures.

Implementation of the Midden-Delfland local landscape plan

The landscape plan was translated into spatial vision plans and development plans for the municipalities involved. In addition, the implementation of the actions in the Midden-Delfland Perspective 2025 was taken up by the Courtyard of Delfland (Hof van Delfland) territorial association, operating with a Co-ordination Group of officials and a Steering Group with politicians from 16 institutional organisations. The Courtyard of Delfland translated the perspective into a 2012–2015 development programme, including a map on which all projects are located. Three years after the finalisation of the landscape plan, most of the envisaged measures were under way. The network of recreational connections related to water and 'slow roads' were also being developed within the Courtyard of Delfland. The concept of 'portals' between city and countryside was detailed further. The design principles thus seem to have become an instrument in the daily practice of the local government officials.

Lessons learnt

An intensive multi stakeholder involvement is an effective way to create a common and broadly supported vision. But that takes time, patience and effort, with professionals facilitating group processes, and a design process with several rounds of zooming in and zooming out.

By taking the initiative for the landscape plan and facilitating its development, the municipalities in the open space and the surrounding cities made a decision in the name of landscape quality. The design principles of the landscape plan are particularly helpful in the daily practice of the municipal officials, especially in relation to private development plans.

A final lesson learnt is that old historical connections and physical structures in the landscape are still important lines of inspiration. In this case, the water management heritage of the landscape was rediscovered in the course of the planning process as a major inspiration for future development. One might hope that such discoveries may happen much more regularly.

Water landscapes and territorial development: the case of the River Ter

Anna Ribas Palom

The aim of this chapter is twofold. In the first place, it presents and reflects on the concept of *water landscapes*, taking into account the different definitions and appreciations offered by different studies carried out on the subject, as well as from a perspective which defends such landscapes as eminently cultural landscapes that offer opportunities for territorial development. Secondly, the chapter presents the case of the River Ter as an example of a strategy for the territorial and touristic enhancement of water landscapes, from its source in Ulldeter (Setcases) to the river mouth where it flows into the Mediterranean sea at the Gola del Ter (Torroella de Montgrí, l'Estartit).

The concept of *water landscape* is extremely complex. A reading and analysis of the different attempts to define the concept within the literature brings to light different nuances that lead us to question the concept itself. Is water an essential element or is it enough for it to be a simple expression of the landscape? Are we talking about water in landscapes or about landscapes of water? In view of such a diversity of readings, this chapter concentrates on landscapes in which water plays a determining role in the landscape's origin and current configuration, as well as discussing how the landscape is recognised and perceived at a social and cultural level by society.

Thus, in our view, the main elements that define water landscapes are: seas, rivers, streams, marshes, lakes and lagoons, deltas, etc., but always in conjunction with other elements that indicate the historical permanence of the relations maintained between society and water, such as dams, bridges, irrigation channels, industrial canals, watermills, floodplains, city riverfronts, paths, industrial villages, borders, literature, painting, and so on. We can find wonderful examples in Mediterranean landscapes where the relations between water and society have created a set of landscapes with considerable ecological, economic, cultural and symbolic value. The current reality of many water landscapes is therefore neither natural nor social but, rather, representative of both aspects at the same time. The adjective *hybrid* has emerged as a key concept to define what is both natural and human, without privileging either of the two attributes, and aiming to overcome the polarisation between a position that remained hegemonic until not that long ago, which emphasises the control of water, resulting in "engineered water landscapes", and a position which calls for a naturalisation of such landscapes which is entirely removed from human interference.

While water landscapes have been transforming and adjusting to the needs of society for thousands of years, their deterioration and marginalisation is a relatively recent process. The middle of the 20th century saw the emergence of huge hydraulic instruments, with their piping, diversions, drainage, tunnelling and other kinds of alterations that aim to control water and subject it to the dominant interests of production. A phase of history thus begins in which the marginalisation of spaces linked to water is exacerbated and in which such spaces are increasingly used for activities that have a forceful impact (such as the case of extracting materials for construction or the discharging of urban and industrial waste water), setting off a process in which the quality of water and the ecosystems associated with it are seriously impaired. In many cases, these water landscapes are altered and degraded to such an extent that their status as natural sites is revoked and their definitive disappearance is thereby legitimised. We find a clear example of marginalisation in the proliferation of the small urban allotments that we find among the canalizations, roads and other urban artefacts. A good part of this landscape comes from the centenary allotments which have gradually been relegated to interstitial spaces put to the benefit of more modern uses, which are becoming more popular in comparison to urban river landscapes.

Water landscapes are therefore subjected to many different threats within the current historical context of profound and fast-moving territorial changes, especially in peri-urban spaces (with the growing number of dispersed cities of low-density and horizontal growth which are far removed from traditional cities of a compact and aggregate nature) or spaces with large road infrastructures and services. In line with the redefinition of the environment brought about by this new model of urban planning, many water landscapes become unwanted spaces and thus fall victim to hydraulic alterations that sometimes result in their total disappearance. This is the case for many Mediterranean peri-urban rivers and streams (which are channelled or buried) and marshlands (which are subject to drainage and urban development). These transformations are often related to the risk of flooding associated with these Mediterranean water courses, many of which are dry throughout most of the year, but may nevertheless cause frequent and violent flooding – on a brief but high magnitude scale – as a result of their torrential nature. Another factor that contributes to the perception of these water landscapes as hazardous landscapes is related to the processes of environmental pollution and degradation that a large number of them suffer from.

Fortunately, however, after decades of degradation and marginalisation, water landscapes have managed to recapture the interest of politicians, planners and citizens. Cities and towns that originated and developed throughout the years under the auspices of water are turning once again to such

spaces as a vital element that ought to be integrated within urban and social planning policies. It is from the 1980s onwards that a new approach emerges in relation to water landscapes; first in response to the urgency of environmental concerns and second in relation to changes in usage and in the social and economic relations maintained with such spaces. Overall, and thanks to advances in urban and industrial waste water drainage policies over recent decades, water landscapes have been cleaned and have seen considerable reductions in contamination levels. For this reason, water landscapes are increasingly becoming important spaces for citizens in terms of leisure activities, social and cultural equipment, as well as for commercial, touristic and residential developments.

Reappraisals of water landscapes are increasingly repositioning them as assets for territorial development. However, promoting the touristic and cultural potential of water landscapes is not without its problems. Firstly, because a good strategy for promoting and actively managing these landscapes must take into account territorial and functional aspects, since only the correct use of the territory will guarantee its conservation. Thus, traditional irrigation landscapes or of fluvial industrial heritage are the result of a close and balanced relation between the system of production, the landscape and material and immaterial heritage. However, this relation may be disturbed by touristic developments as soon as they bring with them functional changes or other alterations that may adversely affect the landscape. And secondly, because while the multifunctionality of water landscapes may enable their survival, this also depends on the innovation of instruments and daily management practices (consortiums, sponsors, foundations, museums, urban management centres, among others), as well as the absolute commitment of public administrations and the development of strategies, plans and projects to reinforce social commitment to the conservation of such landscapes. In short, water landscapes must be fully integrated within territorial projects. In this sense, each particular territory must pay attention to identifying and characterising its own water landscapes, elaborating proposals and activities to enhance them, which should reserve a particularly important role for institutional cohesion and social consensus.

Many successful experiences can be found in Europe which are led by management bodies dedicated to local developments that work to promote water landscapes and territorial planning, as well as new activities aimed at social and economic renewal. Among the different territorial renewal proposals, we find the creation of touristic products linked to cycle tourism and hiking or water sports, such as the initiatives that have sprung up at different times and in different places around the waterways that make up rivers such as the Danube, the Loire, the Rhône, the Elba, the Rhine, the Ebre, and the Ter itself. Other clear examples can be found in the develop-

ment of inland navigation on the Canal du Midi, the rehabilitation of industrial districts such as those in Llobregat for residential, hotel and leisure activities, and the creation of active tourism products such as those related to high mountain rivers (rafting) and continental fishing. Tourism is also a key element in some of the major activities related to urban regeneration projects in river environments, such as the Ria de Bilbao or the riverfront in Girona. Based on existing resources, tourist activities linked to these tourist products promote the value of such resources, while also creating businesses and jobs that offer the services needed to ensure that visitors are able to enjoy the resources and the landscape. In this way, the conservation of natural heritage related to waterways and rivers can also provide the basis for generating new wealth and new jobs.

Behind all these touristic products we find administrations (often local bodies grouped under formulas such as consortiums, foundations, agencies and associations) concerned with the conservation of the natural and cultural heritage of water landscapes, as well as with the pursuit of new opportunities for social and economic renewal based on the reappraisal and renewal of such landscapes. In Catalonia, among the different institutions that have stood out at different moments in time in this regard, we find the County Council of La Selva, with the «*SELWA, un Compromís amb l'Aigua*», («*SELWA, a Commitment to Water*») project, the Parc de la Séquia in Manresa, the Parc Fluvial del Llobregat, the Mancomunitat de la Taula del Sénia, and the Consorci del Ter.

The Consorci del Ter provides us with a case to analyse a practical example of reappraising water landscapes in order to enhance territorial development across the Ruta del Ter. The multiplicity of water landscapes found along the course of the River Ter comprises an enormous quantity and variety of values of natural, productive, cultural, social, historical, symbolic and identity-based significance. The potential offered by this variety of water landscape has led the Consorci del Ter to formulate specific ideas to develop emerging economic sectors, such as river tourism, which generate wealth and jobs while remaining environmentally friendly. The Ruta del Ter is a route which starts at the head of the river and ends at its mouth, which can be followed on foot or by bike. The main objective of the route is to promote the cohesion of the entire territory along the Ter through the discovery, protection, recuperation and promotion of its landscapes. The orographic (mountains, valleys, planes) and landscape (from the high Pyrenean mountains to the coastal marshlands) diversity of the route makes the Ruta del Ter an ideal option for cycle tourism and hiking enthusiasts.

This initiative thus aims to turn the River Ter into an axis of touristic development, thereby connecting two of the main touristic attraction points of Catalonia - the Pyrenees and the Costa Brava - by way of a sustainable tourist model based on the

endogenous resources of the territory around the river. The route is approximately 220 km long, with a gradient of up to 2,200 m and an average incline of less than 1% (the greatest descents are found at the start of the route where they are 8%); furthermore it is one-directional (descending). The design of the route prioritised the use or recuperation of existing channels of circulation, characterised by low levels of traffic and by being suitable for bikes (wooded areas, greenways, secondary roads, paths), as a result of which it is not always completely set apart from surrounding traffic. Rather than following the waterways of the Ter in the strictest sense, the route sometimes passes through some of the most interesting riverside populations in the vicinity. As a cycle tourism product, it lasts around five or six days, even though it can obviously be divided into shorter stretches or even organised by following five thematic routes directly related to the river ecosystem (cultural, natural, literary, and gastronomic heritage, or historical floods).

In short, the Ruta del Ter provides a well-received and practical example which shows how concerns to valorise and plan water landscapes may result in the elaboration of new proposals for sustainable territorial development.

II.

River landscapes in art and cinema

Dam, wall, landscape

Pere Sala

Most cinema lovers agree that the most dangerous scene in cinematographic history is the breathtaking leap made by James Bond from the 220 m high wall of a huge dam at the start of the film *Goldeneye*. The scene shows the famous double agent leaping into the air with his feet tied, ending up in a secret Russian base located inside the dam itself. In reality, however, the dam is not Russian nor is there any secret base inside it. The wall, known as the Contra Dam, belongs to the Verzasca Dam, the fourth highest dam in Switzerland, located in the valley from where it takes its name.

These scenes of the film highlight the fact that dams provoke an ambivalent sensation of attraction and fascination coupled with fear and rejection. In general, we see such artefacts as monumental, majestic elements which stand out in the landscape, having a transforming effect on it and carrying powerful symbolic weight. We need only look at social networks to see the extent to which people are interested in dams. The networks are flooded with all kinds of photographs highlighting their aesthetic value (ranging from the visual power of their walls to their industrial parts, but also taking in the stark contrast between the masses of water and the sides of the mountains; the play of light with the different textures, colours and shapes; their absolute clearness, vastness and horizontality; and the brilliance and dominance of the water's surface).

Another relevant point is that dams are often present in literature, painting, cinema (particularly the science-fiction genre), photography, comics, advertising (particularly cars), magazines, and exhibitions, and are even used in artistic interventions where they are endowed with aesthetic qualities and meaning. These forms of representation have changed our way of understanding dams since the first quarter of the 20th century onwards, while also affecting the meanings which people attribute to them.

This chapter is inspired by a curiosity to know what images, meanings and ideas these enormous engineering works convey to us, how these works have varied over time, and how they are moving today towards heritage status, as a dominant element of a landscape that is gradually emerging as a new landmark within our country. The chapter invites us to scrutinise these immense concrete structures from inside out, while also sharing some reflections on the landscape significance of dams, considered as new landmarks, and offering new alternative readings to the hegemonic readings commonly found on the subject.

Economic benefits, ecological impact and geo-strategic functions

The benefits of dams are well known: they store water reserves to guarantee supplies for domestic, agricultural and industrial use; control water flow and prevent flooding; and generate hydroelectric energy. More recently, they also offer leisure strategies to stimulate local economies. In contrast to their economic and social benefits, the construction of dams clearly has an impact in ecological and environmental terms: they tend to be constructed in extensive areas of natural habitat and, as a result, their incorporation in the landscape alters natural habitats and waterways as well as the ecological flow of rivers further downstream, meaning that less fine solids flow into the deltas. Dams have also been shown to play an important role in geopolitical conflicts. However, since the main purpose of this chapter is to consider dams as an element of the landscape with

a huge visual and symbolic power, we will focus here on discussing their capacity to radically transform specific landscapes in short periods of time.

Forty-five thousand large dams in the world

It may surprise us to find out that there are almost 45,000 large dams across the world. There are 38 dams in Catalonia that produce over 10 MW of electricity, and 345 smaller ones, most of them working, which are mainly located at the basins of the Noguera rivers, the River Segre, the River Ter and the Llobregat River. Their construction completely transformed Pyrenean and Pre-Pyrenean society, leaving an extraordinary mark on the landscape. Catalonia today cannot be understood without the influence that these huge hydroelectric infrastructures have had on the country, particularly in the Barcelona of the mid-twentieth century.

When dams were symbols of greatness, modernity, and a fortification of the national identity

Up to the 1980s, the iconography of dams represented an undeniable exaltation of the development of a territory or country. Dams were symbols of greatness, of modernity, and of a fortification of the national identity, and the landscape was very rarely present in the design process or in the conception of the work. The opinion of the local population was not taken into account either. Once the dams have been constructed, the public authorities made lofty speeches exalting their powers and expressing fascination with technology and the construction of idyllic landscapes that became symbols of modernity and of a way of seeing progress. This is clearly reflected in the weekly news bulletins of the Franco regime, *No-Do*, which were shown in Spanish cinemas before every film between 1942 and 1976. The peculiar signature tune and the repeated images of General Franco inaugurating new dams are firmly embedded in the memory of different generations.

In the United States, manifestations of this kind were seen in photography campaigns or on stamps and postcards, which bore the inscription "Built for the People of the United States of America". The Hoover Dam on the border between the states of Nevada and Arizona was an important symbol of this era. While many films and television series have chosen this infrastructure to film particular scenes, the mythic film *Superman* (1978) stands out in particular.

Nevertheless, recent cinema has also reflected on the human being, showing an initial appearance of a triumphant, proud actor capable of conquering nature who, in reality, finds himself alone, paralysed and limited in the face of the imposing hydraulic infrastructures, as we see in the film *Vajont - La diga del disonore* (2001). The film shows how some of the main characters doubt the capacity of human beings to dominate all that surrounds them.

Dams and landscape: monumentality and verticality

The monumentality and verticality of dam walls provokes a sense of spectacularity that depends on the relation between the dam and the valley below it; the size and proportions of the wall in relation to the height of the person observing it; and the contrast between the artificiality and naturalness of the whole panorama. It is worth highlighting that the human being's schema of perception of landscapes is fundamentally horizontal, meaning that they tend to overestimate vertical dimensions. The type of dam in question also has an enormous impact on the way it is perceived: gravity dams with smaller gradients tend to reduce the verticality effect. By contrast, the sensation of verticality is reinforced in arch dams, which tend to be more slender and taller, and which are supported between their narrow and deep side walls. This combination of factors (verticality, typology and contrast) provokes an intense sense of grandeur in the observer, in which they feel completely overcome and insignificant within the setting.

Another element which is highly relevant from a visual and landscape perspective is saltwater, which has a huge power of attraction. It attracts because it has a special dimension that exceeds the human scale: the strident sound of water cascading into the air, the surprise factor, the force with which it flows, and the sense of danger it generates.

Sensation and representation of the risk of the dam bursting

Part of the fear of dams comes from the feeling of risk that they generate. The risk of dam's bursting and flooding nearby populations is a phenomenon that has been represented on several occasions in science-fiction films. On the other hand, it is sometimes the case that fiction and reality feed into each other as was demonstrated in 1983 with the broadcasting of fragments from *Susqueda*, a book by Miquel Fañanás that narrates the story of the bursting of the Susqueda Dam. Their broadcast on Ràdio Girona created panic and alarm among some people living in the area.

When the dam "covers" the landscape

Dams also have an enormous capacity to create new landscapes. Few human interventions have changed the landscape as much as the construction of dams. One of the first consequences is that they generate an immense mass of water that covers the landscape, thus making it disappear under it. While we may be accustomed to transformations in the physiognomy of the landscape (changes to agricultural systems, deforestations, urbanisation and the construction of new infrastructures, etc.), the complete "covering" of a landscape is an unprecedented phenomenon in the history of humanity, as well as being a highly powerful symbolic image which lends itself to visions of universal deluge. During the "covering" of the landscape, people experience the process with a

degree of confusion and alarm since the landscape in which they have always lived is suddenly changed beyond recognition. This results in significant migrations, as reflected in the haunting, theatrical Chinese film *Sanxia haoren*, based on the construction of the Tres Gorges dam. The construction of a dam also means that the elements and values of a certain landscape disappear. And it is precisely here where a desire to recover the memory of a landscape that once was re-emerges over the years; or the desire to discover what once lied beneath the waters. This is revealed in the expectation generated by the bell tower of the Sau Reservoir when water levels drop.

The emergence of an industrial landscape when society itself attributes heritage value

Art, cinema, and photography have all made a gradual contribution to a shift in perspective whereby, paradoxically, industrial objects (including energy artefacts) that were previously avoided or even feared have acquired a certain appeal and attraction. In the case of dams, they represent a landscape (made up of hydroelectric infrastructures, dams, turbines, generators, transformers, tanks, elevators) that, while still maintaining their original function, are also starting to acquire heritage status. They acquire heritage status because they are valued by communities that are constructed thanks to the links and lived experience between the people and the territory; which is to say as part of everyday life. This is another sign that advances are being made towards a concept of heritage which is more democratic, participative and plural.

In Catalonia, the Renaissance created a collective imaginary linked to the Pyrenees, strongly based on an idea of the landscape as natural, rural, and pure, which contrasted sharply with the antithetical values transmitted by the energy constructions. Today, however, we are witnessing the gradual integration of part of these energy infrastructures in the collective imaginary of the Pyrenean landscape. This process does not replace the landscapes of particular reference within the Catalan imaginary (Montserrat, the Pyrenees, the Costa Brava, among others) that took on iconic value many years ago, if not centuries ago. However, the emergence of these industrial landscapes indicates that the spectrum of landscape canons with which people identify is undergoing a process of diversification.

Rivers in contemporary art and some notes on practical potamology

Federico López Silvestre

Artists have been in dialogue with rivers for some time now. In their works, they are not only present-

ing a certain aesthetic, but also suggesting a varied array of practical and ethical potamologies. The first thing to do when studying their relation with water is to follow in the footsteps of Bachelard, who identified those who stop before it, looking for simple decorations, or seeking to control it, and those who inhabit it like fish, since they “share” its substance. With regards the first kind, we can find many accounts among such avant-garde artists who, as is well known, turned away from wild nature and looked instead to rivers to propose dams as stony as the ones depicted by Futurist architect Antonio Sant’Elia. By contrast, since the nineteen seventies, artists have turned once again to visualising rivers, even prior to contemplating them, understanding, without realising, that a “kind of deep intimacy” or “elusive destiny” can be extracted from their beds. Unfortunately, what we tend to find among these artists is a specialisation, with the poetics insisting either on the “solid constancy and beautiful monotony” of rivers, or on the more mobile reverie of their surfaces and their fragmentary nature. Extremes such as these suggest a wide array of fluvial ethics which are in need of new proposals and new terminology.

Siddhartha and the river

What we seem to find in the work of some of the main players of the *Land Art* movement of the seventies is a gaze towards the depths of the essence of water. Only *Land Art* manages to make a categorical affirmation that what water does with an imperturbable rhythm can be considered art, thus contemplating the river as a kind of sculptor or drawer.

In *Wooden Boulder* (1978-2003), David Nash (Esher, Surrey, 1945) narrates the story of a tree trunk, from the moment when it was chopped from the stump of an ash tree, to the later point when it was placed on the banks of a creek, up to the moment when it was lost in the ocean twenty five years later in the mouth of the Dwyryd estuary. In *O Ribeiro* (1978), one of the most interesting works of the Portuguese artist Alberto Carneiro (Coronado, Minho, 1937), we detect the abandonment of an expressive and formal exploration of hand-crafted materials, in favour of an opening up of the field of perception, to the idea of the artist as a mere spectator or observer, and to a more corporeal and phenomenological form of investigation. At the same time, the award-winning Richard Long (Bristol, 1945), explored the idea of a river-artist in experiments that would lead to works as poetic as *River Avon Book* (1979). At a glance, there does not seem to be anything out of the ordinary about these aquatic pieces of *Land Art* that depict the common aspect of the river as that which flows, offering limitless glimpses. But what is certain is that Nash, Carneiro and Long were always keen to extol the timeless nature of water. Not only did they aim to let the riverbed speak for itself before addressing it, but rather they started out from the

undisguised premise that nature works as an artist who speaks through its forces.

The fact that these artists fused Buddhism and Pancalism is highlighted in a multitude of ways. For example, on the stamp showing feet with eyes by Richard Long that invokes the lotus feet used since the beginning of Buddhism; on the mandala of pure geometric shapes being constructed by Carneiro in his catalogue on *O Ribeiro*, or in the comments in which David Nash refers to the way in which Buddhism recognises the presence of geometrical purity in the natural world. Nevertheless, however sophisticated his ethics may become, as a result of their Buddhist inflection, some of their points remain questionable; possibly because, as Nietzsche knew very well, the ethics of a certain Buddhism always lead us to the most clear and fruitless form of nihilism. In other words, what on the basis of avolitional reflexivity would appear to negate this version of Buddhism, the fact is that the spectres that inhabit the darkest parts of the river not only speak to us of communion and love, but are also a source of pain and death which we might resist if we contemplate these aspects from a different ethical framework and a different set of principles.

Water mirrors

The irascible Nietzsche enjoyed contemplating the fragile surface of water, affirming time and time again that everything is an illusion and that insisting on depths, on differences between matter and form, or between truth and lies, simply constrains us to obsolete moralism. Everything in nature is deceitful, or at the very least confusing and chameleonic, and, in line with what the philosopher argued, there is no better sign of this than the transvestism of the animalcules of the river. I remember this now because, after the seventies, so-called Nietzschean post-structuralism recovered these ideas when referring, among other things, to the “end of grand narratives” in a setting awash with fluvial metaphors that was to permeate the work of the new water poets.

The “end of grand narratives” was nothing other than the acceptance of “chaosmic” fragmentation and Nietzschean “perspectivism”, and the only thing hidden behind such notions was the thesis that we live in a universe similar to a fast, malleable and fragmentary aqueous space in which, as Deleuze liked to point out, we merely float around like powerless “swimmers”, with each and every one of us and all other species that inhabit it having their own view of it; their own mediocre representation.

We could say that reality is so confusing that it affects us in two ways, meaning that the “imagination” of the river now flourishes along two lines. On the one hand, with artists such as Perejaume (San Pol de Mar, Barcelona, 1957) who, in works such as *Espejo de los Crous* (1989), recalls our internal and psychological lability, as well as the pregnant and all-encompassing role that linguistic and artistic codes end up having; and, on the other hand, with pho-

tographers like Axel Hütte (Essen, 1951) who highlight “chaosmic” fragmentation in series like *Water Reflections*. In the series of portraits by the German photographer in particular, the insistence on the blurry aquatic reflexes suggests a deep meditation process that goes beyond the realm of photography. However, as someone once wrote, these images not only “artify” the wild, but they also turn out to be deceitful insofar as it is the technique used in them that silences the light and the landscape.

Our loathing for the rippling of the stream

It is clear that, once we accept the power of contrivances and representations, then a considerable dilemma opens up: a dilemma that turns our attention to a series of ethical questions. In this respect, Nietzsche’s call for transvaluation was clear. If everything is representation, then there are no eternal, absolute morals but rather as many morals as there are individuals. If we are talking about a struggle between people, then it is the people themselves and their will to power that is at stake. And if we are talking about man and the rest of nature, then where does that leave the river if everything comes down to mere form and our representation? The river will stay afloat as long as it conquers with all its force, however, if it is man who forgets it and bends it...

It is clear that, from a technical point of view, the response has always been resounded. Both in the field of representation as well as in terms of projects and interventions, the inheritors of instrumental rationalism and the idealism of freedom have fostered a practical potamology that, taken to its limit, turns its back on the river, favouring a paradoxical fluvial intervention against the flow of water.

Since the eighties, digital formal imagination has started to replace the real landscape with the rivers in *The Matrix*, which in actual fact are streams of codes which take on a physical appearance, such as those in *Avatar*. In the “*Paisatges sense memòria*”, (“Landscapes without memory”) project, the Catalan photographer Joan Fontcuberta (Barcelona, 1955) uses software capable of converting two-dimensional cartographic data into three-dimensional simulated images. However, as he himself recognises, these new virtual landscapes with their strange waters appear to be: “barren, wasteland, lands with no witnesses, dispossessed of architecture, untouched by the passage of time, removed from the experience of space, infinite territories frozen in time... The *Identity-Rendering* completely escapes human desire or love of life”.

The second example of the paradoxical fluvial interventions that appear to go against the flow of water is hidden in the Western engineering and architecture which affirms that we can do whatever we like with the world for the benefit of the human species. The way that Futurism considered Rivers can be summed up in two sentences. That of Boccioni, who argued that Futurists detest “that which is related to the country, the peace of the woods, the

ripple of the stream...”, and that of Sant’Elia, who added that future cities would be entirely made of cement and iron and that every “generation will have to build its own city”.

The consequences of this way of thinking can be seen today, insofar as worldwide urbanisation and cementation processes have been so monumental that we hardly need to comment on them.

A mixture of humility and pride

As is now apparent, the artistic dialogue established with rivers has been divided into two radical positions for various decades. On the one hand, we have the ethical and aesthetic approach of engineers and artists concerned, above all, to satisfy the needs of an ever increasing population. On the other hand, we have the artistic and moral approach of some increasingly aquatic and lyrical poets who appear to be content to return to the level of fish and to compose epitaphs. In fact, it is important to understand the division since, although their methods may sometimes fail, both sides are right to some extent in relation to their objectives. This being so, which is the most attractive response provided by recent art and engineering?

Bearing in mind that some experts are already working on engineering, it is worth concentrating on an exploration of the “third way” in the art world since, intuitively, some creative minds of the 21st century are carrying out a highly needed dialectical movement which places us on an appropriate potamological level. If in the seventies *Land Art* appeared to bear witness to the return of a material fluvial experience and the most Buddhist form of ethics (thesis), and since the end of the eighties democratisation and the growth of all kinds of techniques pushed us into the furious postmodern simulacrum that tended to muffle the voice of the river in a thousand reflexes and to privilege self-serving morals (antithesis), since 2004 onwards, some attentive artists and photographers have tried to mediate between both extremes, aiming for a third type of relation with the river that sometimes brings us closer to the so-called *Mixed Reality*, and other practical potamology (synthesis).

We find a good example of this in the *Mil rios (A thousand rivers)* project of Galician photographers Manuel Sendón and Fran Herbello (2012-2013), which manages to achieve the perfect synthesis of this hylomorphic way of imagining the becoming of fluvial art, finally contemplating both the substantial and the formal together. The idea consisted in crossing all the Galician Rivers by canoe. The photographers gave themselves between two and three years to do this and the resulting experience can be summed up in three steps. At the outset, Sendón and Herbello seemed to want to turn back, to go back to the seventies, turning their back on the camera and representation, immersing themselves in the thousands of Galician rivers with their bodies and their canoe, as Alberto Carneiro had done in Portugal; it

seemed that, wherever possible, they wanted to let the river and the landscape speak to them in order to note these points down later in their logbooks. However, during a second stage, they abandoned this commitment to the mere material and turned back to form and photography. It was in this way that their notebook full of anecdotes and discoveries, covered with shimmering photographic images, came about. Nevertheless, overcoming the classic debates about representation, in third place Herbello and Sendón also introduced the trace of their excursions, captured by GPS, thus moving beyond the route travelled to the realm of cyberlandscape.

Thanks to such a radical shift, the work of these photographers helps to complete the journey. In fact, the result is neither real nor virtual, nor analogical or digital, since, as in *Locative Arts*, the proposal shifts between specific landscapes and cybernetic abstraction. If anything characterises this new dimension of fluvial landscape it is precisely the intention to situate itself at the limits. This is a new *Mixed Reality* that reminds us of the idea captured in the old hylomorphism: that rivers have always been “dialectical images” in which we need to consider both surface and depth, that which remains the same and that which changes.

Finally, the ethics that follows from this does not fit with earlier ones. To a certain extent, Herbello and Sendón’s proposal implies a humble baptism in physical waters, but, at the same time, a proud contemplation of the playful value of human representations and interventions. This is the moral of the angler who wants to benefit from the river, but without spoiling the lively flow of its waters.

The poetics and uses of fluvial landscapes throughout the history of cinema

Alan Salvadó

In *Histoire(s) du cinéma* (1988-1998), Jean-Luc Godard opens up an avenue of thought concerning cinema (and the history of cinema) that consists in a dialogue between the forms present in the (cinematographic) images and sounds of the 20th century. The French filmmaker breaks with a single and unidirectional history of cinema, in order to show the existence of multiple histories which remain open and in a process of permanent re-writing. Godard’s approach, particularly his “inter-images” thinking, is adopted here to propose a (microscopic) history of the cinema based on the visual motif of the river; i.e. a synecdochic approach that offers an alternative way of considering cinema history. This history branches off into two: an individual one which is constructed on the basis of my memory (audiovisual) as spectator, and, at the same time, a collective one which is framed within a potential history of

cinematographic forms. This (individual-collective) dialectic turns the journey proposed throughout this chapter into a *work-in-progress* in which the reader may establish a dialogue between their own images and the ones suggested: images that, as (derivative and fragmentary) meanders, trace a potential panorama of the aesthetic and narrative uses that cinema has made of fluvial landscapes. Every one of the mutations or reinterpretations that the motif has gone through, since its origins up to today, are indicators of the evolution of cinematographic techniques and aesthetics.

The use of the motif of the river as a rite of passage is the starting point for this journey. There is no doubt that Mark Twain and the Mississippi River are the most succinct literary figure of the “mythology” of the childhood dream of the great adventure. Few films have managed to connect Twain’s poetics and the visual motif of the river in such an effective way as *The Night of the Hunter* (1955) by Charles Laughton, given its capacity to intertwine three key concepts: cinema, childhood and dream. Inside this particular fairy tale, the night scene in which the children run away from home, travelling down the river in a little boat, becomes a paradigmatic image of the use of the motif as a rite of passage from childhood to adulthood. The children, cradled by the gentle flow of the rivers’ waters, look forward to the discovery of a new world as if they were about to delve into *Alice in Wonderland’s* rabbit hole.

In the apparent form of a children’s tale, Victor Erice’s debut film, *El espíritu de la colmena* (*The Spirit of the Beehive*) (1973), also explores the use of the river as a film device for confronting reality and dreams. One of the most significant scenes of the film, in which the main character Ana runs away from home and meets the monster Frankenstein in a dream-like state, takes place on the banks of a river. In the traumatic journey towards the loss of innocence experienced by Ana, the motif is of key importance in explaining her metamorphosis.

In one final image of (fluvial) rites of passage, *L’Atalante* (1934) by Jean Vigo, we witness the river journey taken by a recently married young couple who set off in search of a romantic adventure and end up coming face to face with the everydayness of love. The most representative scene of the film occurs when, after the couple argue and end up splitting up, the young man hurls himself from the bow of the barge into the river. Immersed there in the water, he expects to find an answer to his amorous uncertainties in the materiality and poetics of the water. The beautiful underwater images give rise to the great epiphany of *L’Atalante*: the reappearance of his partner’s face. The identification between face and landscape foregrounded by Vigo condenses two of the uses of the visual motif: the character of passage and the connection with the cinema screen, onto which we (over)impress our hidden desires.

The link between the motif of the river and the filmic device is reinforced by notions of mobil-

ity and continuity. In the river, cinema finds the ideal figure for representing the dual mobility of the cinematographic landscape: the movement of the landscape (the rhythm and cadence of fluvial waters) and landscape in movement (river journeys). If we focus on the latter, there is no doubt that the adoption of a mobile gaze is not exclusive to the cinema, although it is considered to be the moving art par excellence. By contrast, the classical pictorial landscape tradition (XVII century) is presented as a territory in which the habit of shifting the gaze from one element of the painting to another is fostered, understanding the contemplation of the landscape as a kind of *work-in-progress*.

In 1896, Eugène Promio (cameraman for the Lumiere Brothers) filmed the virtual journey along the Grand Canal of Venice that traced the course of a river in classical landscape painting. With the camera set up in a gondola, the world unfolds before the eyes of the first cinema-goers, with travelling film techniques thus being associated with the fluidity of the water. This first link between river and movement explains the existence of what we could refer to as *river-movies*, which are a clear sub-genre of the *road-movie* genre. Two examples that illustrate this use of the river can be found in John Boorman’s *Deliverance* (1972) and Francis F. Coppola’s *Apocalypse Now* (1979). With a distinctly critical and protesting spirit (ecologist and anti-war respectively), both films transform the road of the New Hollywood imaginary of the seventies into a fluvial trail that leads to a territory which is found to be wild and archaic. It is no coincidence that, in both cases, following a similar pattern to the classics of the *road-movie* genre, at the end of the journey down the river the stories end up with an outbreak of violence.

However, the continuity associated with the river offers us another use of the *visual motif* as a metaphor to represent the passage of time and, by extension, of History itself. In this sense, it is interesting to see how cinema has used the winter variant of the motif as an element that helps to foreground the dialectic between immobility and mobility. The image of the thawing of the river in its inexorable advance, found in both Vsevolod Pudovkin’s *Mat* (1926), as well as John Ford’s *Young Mr. Lincoln* (1939), respectively depicts the way in which the Soviet people were predestined towards revolution while the American people were predestined towards democracy. In both cases, the passage of time (of the tale, the season and the history) is juxtaposed in a simple and concise way in the fading between the images of the frozen river and the river in movement.

In another example, it seems no mere coincidence that in *Way Down East* (1920), filmmaker David W. Griffith also uses this dialectic associated with the thawing river to construct the prototypical last minute rescue device. Like the flow of sand from an hourglass, the river advances interminably towards a cascade and the hero, fighting against the

passage of time, jumps acrobatically between the blocks of ice until finally rescuing the girl. This is, without doubt, a figuration of the river (understood literally as a time line) that has given rise to a veritable cinematographic tradition.

In its most geographical dimension, the river motif takes in another of the unique qualities of the cinema (together with movement): *découpage*. Rivers divide and fragment the unity of a territory into different parts, often creating a border at certain points along their route. Linked to the notion of continuity, the *visual motif* of the river can also be understood as a creator of discontinuities. It is possibly in the poetics of the *Western*, and most specifically in the mythology of the promised land, where this variant acquires its maximum splendour, representing, firstly, a natural obstacle in the divine mission of the first North American colonisers (*Bend of the river*, 1952, by Anthony Mann) and, subsequently, in a space to take shelter from the “other” (*Río Grande*, 1950 by John Ford).

In the hands of Greek filmmaker Theo Angelopoulos, the river acquires a tragic and dishonourable dimension. In *To meteoro vima tou pelargou* (*The Suspended Step of the Stork*) (1991), he offers us one of the most significant images of a Europe with multiple borders in the form of the wedding held between the two banks of the river that separate Greece and Albania. The almost operatic scene connects the personal, social, historical and religious, presenting a family moment turned into a transcendent testimony to the Europe of the late 20th century and, unfortunately, the early 21st century. The (empty) intermediate space that opens up between the bride and groom represents the melancholic European distance from the far removed ideas of liberty, equality, and fraternity.

Used tangentially by many filmmakers, the river is often at the centre of the *mise-en-scène* in the work of Jean Renoir and Abbas Kiarostami, thus creating a serial device based on repetition and a return to the same motif throughout different films. If we take Renoir’s work as an example, we can find the same motif acting as a central theme or narrative drive in films as diverse as *Boudu sauvé des eaux* (*Boudu Saved from Drowning*) (1932), *Partie de Campagne* (*A Day in the Country*) (1936), and *The River* (1951). The serial approach goes further than merely citing or making a formal reference to the motif; in each film the temporal dimension of the river is explored and covered mainly from a cyclical perspective. Time and movement, basic pillars of cinematographic art, are juxtaposed once again in the service of the river.

Two final rewritings of the motif that have a particular presence in the most contemporary representations of the river are found in the most fantastical and illusionistic one of Méliès, and those of the Lumiere Brothers, which are ontologically rooted in reality. With regards to the latter, the documentary film *Dies d’agost* (*August Days*) (2006) by Marc Re-

cha offers a particularly clear example. Colonised by the digital spectacle, almost like an organic reaction, a series of aesthetic proposals are emerging and persisting that are related to the most impressionistic ideology of the Lumiere Brothers in their faithfulness to and fascination for certain landscape atmospheres, settings and motifs.

We shall turn finally to the digitalised figure of the river in order to conclude this chapter. At the height of the era of simulacra and artifice, the motif has become something of a theme park attraction in the cinematographic imaginary. In *The Hobbit: An Unexpected Journey* (2012), Peter Jackson offers us a good example through the vertiginous descent of the main characters downriver. Reminiscent of the imaginary of video-game platforms, the mobility of the river is understood as a pure attraction for the spectator’s gaze, a mere spectacle for the eye, thus detracting from any experience of dream or imagination related to the landscape: Mark Twain’s Mississippi River phagocytised by *Disneyland*.

III.

River landscapes: Heritage and uses

Agricultural landscapes and water heritage: the need to preserve the heritage values of an everyday landscape in the mediterranean region

Rafael Mata Olmo

This chapter focuses on landscapes in which natural and domestic water constitutes the fundamental structure of historical, territorial irrigation systems. Historical irrigation landscapes, or water landscapes, are those in which the agrosystem is based on a more or less sophisticated hydraulic complex that involves acquiring the resource (surface water or groundwater), storing and distributing it, with

the architecture, know-how, customs and institutions that all this implies, and which are expressed in the materiality of the landscape and in popular and cultural representations of it. Since many of these historical irrigation systems are found in urban areas, just outside the cities with which they have traditionally maintained close co-evolutionary ties and exchanges, perceptions of them form part of the everyday life and the local experience of many urban inhabitants and, therefore, of their quality of life.

The patrimonial appropriation of the values and meanings of water in the multiple material and immaterial manifestations of it has progressed in a significant way – without negating the irreparable abandonments and losses that have occurred – at an institutional level, with its recognition as an asset bearing cultural interest in relation to the specific components of hydraulic systems, and also from the point of view of citizens, through social movements and bodies who take on and defend the heritage value of the water system, struggling against its neglect and destruction and fighting to gain institutional consideration that does not always materialise. The other level of patrimonial appropriation that is of particular interest in a book such as this is that of landscape; that relating to the character of a territory of old irrigation systems that join together rural and urban fabrics through water, as well as processes and uses that are expressed and communicated through the landscape, as a complex and integrating fact in their materiality, perception and representations. Heritage value now falls on landscape in its entirety, without prejudice to the values of some specific aspects, such as hydraulic components, plots, paths, the crops and agricultural practices characteristic of the place, or the vernacular constructions belonging to the irrigation system. These elements are already relevant in themselves insofar as they are an integral part of agricultural heritage, but they acquire their full interpretative significance and a specific value as components of the landscape; of the “heritage of heritages” that the landscape is.

In regions with a Mediterranean climate (coastal and inland), these irrigation landscapes are the most mature expression of the cultural landscapes of water and constitute identifying traits characteristic of whole counties or regions, as occurs with the Huerta de Valencia and the Huerta de Murcia, with their fruit and vegetable plantations. Awareness of them has grown considerably over recent years, driven by heritage studies focused on the water systems that sustain them, as well as, more recently, by typological or case studies of landscapes and of agricultural landscapes in particular. Today, we have a systematic view of the diversity of historical irrigation landscapes which attends to the most significant variables of their character: to the geographical and physical conditions upon which they stand; to their particular histories from a long-term perspective and in terms of their different layers, in many cases indicating Muslim and even Roman origins

that have remained functional up to today; to the actual size of the space watered and the agricultural practices and use of the land, that have a huge morphological, functional and perceptive significance within the landscape; and, logically, to the diversity of the water and hydraulic systems that structure the landscape.

Probably the most numerous, extensive and best represented type found on the Peninsula are the lowlands, which contain river waters, groves, floodplains and low terraces in one single ecological, socio-economic and perceived system, with their complex agricultural, hydraulic and urban systems which are traditionally founded on the use of water and “respect” for it. Another main type of historical irrigation landscape is that which is outlined in the coastal floodplains of the Mediterranean and those constructed, almost always in more recent times, on lagoons and marshlands, deltaic areas and partially drained estuaries. As a counterpoint to the traditional irrigated lowlands and coastal plains and deltas, the varied repertoire of small mountain irrigation systems stand out due to their environmental and ethnographic value.

The values of these landscapes relate to situations and processes of an environmental, socio-cultural and economic-productive nature. Material values are intrinsically linked to immaterial ones, to wisdom about cultivation and crops, and to the important legal institutions that manage water such as the Consejo de Hombres Buenos de la Huerta de Murcia (Council of Good Men of the Huerta de Murcia) and the Tribunal de las Aguas de la Vega de Valencia (Court of the Lowland Waters of Valencia), included on the Representative List of the Cultural Heritage of Humanity in 2009 (UNESCO). This chapter highlights the economic and productive significance of plantations and peri-urban lowlands emphasising, in particular, their food production.

Despite the increasing awareness and social appreciation for these kinds of public goods, their general state in peri-urban areas has continued to deteriorate over recent years. The clearest indicator of this can be seen in the drastic reduction of agricultural land, which is being increasingly replaced by urban uses and large infrastructures, thus presenting different occupation models for the irrigated areas. The reduction and fragmentation of agricultural land and the increasing loss of viability of farming activity in an adverse local environment is also compounded by other processes of environmental deterioration, such as the pollution and salinisation of water, the presence of uncontrolled waste and thefts at the holdings which are characteristic of neglected areas, or the lack of conservation and ruin of heritage elements linked to the use of water.

While not abrogating the responsibility of hydraulic policies and river basin districts in the preservation of cultural landscapes historically constructed around water usage, the expanse, nature and complexity of these landscapes means that

their future viability depends largely on the *effective* application of territorial planning instruments at a metropolitan level or in urban agglomerations. In certain cases, the application of specific forms of cultural historical heritage legislation may also be considered, such as that of Historical Site or Cultural Landscape status when applicable.

But however essential such protection measures may be, on their own they are not enough to ensure the maintenance and vitality of these historical peri-urban and metropolitan irrigation areas. Strategic action is required to promote agriculture, counting, in the first instance, on the productive base of the area and the circuits and agents of distribution and consumption. The proximity, identity and goodness of local products constitute a very important element of food quality while, at the same time, promoting the quality of the landscape. The work being carried out along these lines by certain “agricultural parks” is very revealing, as highlighted in the experience of the new Parque Agrario de Fuenlabrada (Agricultural Park of Fuenlabrada), inspired by the Agricultural Park in Baix Llobregat and the pioneering ones found in Italy. To ensure a coherent territorial project aimed at protecting and stimulating peri-urban agricultural spaces and their link with city projects, at least three factors related to participation and management should be taken into account, as demonstrated in Fuenlabrada: in the first place, local authorities must be actively involved in the project; second, a specific figure must be assigned to catalyse the different initiatives in the area; and, finally, local agents must be willing to build future scenarios on a shared basis. This chapter argues that an economically viable agriculture of quality, local produce must manage the landscape values that it constructs, with the aid of any contractual support that may be provided. At the same time, a landscape which is modelled and vitalised for agricultural purposes also provides services of benefit to the community on a whole, insofar as they are common goods, while also benefitting agricultural production, markets, and the agricultural brand itself. The task of promoting participation and the values of the landscape within agricultural parks clearly aims to preserve and boost these areas, to manage the activities and uses of the land applying landscape criteria, particularly in relation to farming practices and their interaction with the landscape, as well as to disseminate the identity and values of the landscape with a threefold aim: educational; to promote an informed and convivial public use of rural peri-urban spaces; to strengthen the identity of local agricultural production; and to promote the sensorial and not only organoleptic experience related to the consumption of quality local food produce. The local food supplies and short distribution channels that make this possible play a crucial role in the perception of the peri-urban agricultural landscape, insofar as they enable bonds of knowledge and trust to be recovered and strengthened between consumers and local producers, on the basis of a productive

activity that offers food products while also helping to shape a landscape charged with material and immaterial values. In this way, and as Josep Montasell argues, “a co-feeding relation” is established, based on the principle that production and consumption are cultural actions, since they take place in unique territories with inherited traditions which have their own voices and their own social demands. This therefore points to a territory which is humanised and modelled in line with the actions of a specific, identifiable community; in short, a landscape.

In the first instance, a strategic planning approach to organise phenomena related to metropolitanisation that put pressure on peri-urban agricultural irrigation spaces is the way to ensure their preservation. In this sense, despite numerous non-compliances and frustrations, we continue to advocate supra-municipal territorial plans that establish clear rules on land use and limit urbanisation. However, if these spaces are to be home to a vibrant agriculture that offers interesting landscapes, the links between country and city need to be restored, bestowing particular strategic value on food, as a cultural act that reflects the identity and quality of the production of a local area with its own specific history. This means fostering a system of production and consumption based on fairer economic exchanges which have minimum impact on natural resources, and with the key players in the production chain – producers and consumers – having a greater decision-making capacity. In other words, the priceless old landscapes of peri-urban irrigation areas need to be turned into spaces of food democracy within each municipality, so that, as Hassanein advocates, “all members of an agro-food system have equal and effective opportunities for participation in shaping that system, as well knowledge about the relevant alternative ways of designing and operating the system.”

Formation, degradation and recovery of the water landscapes of the Po Valley

Francesco Vallerani

This article seeks to demonstrate the role that water landscapes might play in the process of rediscovering some of the important symbolic and cultural links that emerged during the formation of the water landscapes in Europe. The objective is for that knowledge to permit the understanding of these landscapes’ potential and hence help with more effective territorial planning. Certainly water is a common asset and the strategic nature of its management, especially in light of the growing demand for this resource, raises questions which grow ever more

urgent and require adequate European policy. The problem does not only lie in uncoordinated national policies, but also in the strength of modern rhetoric which prevents an important paradigm shift in technical options for the control of hydrological risks and water management strategies in agriculture.

The Po Valley is one of Europe's widest hydrographical systems. The Po River basin collects an extraordinary variety of inputs ranging from the the Alps to the northern slopes of the Apennines. The area includes the Venetian and Friulian plains, neither of which have rivers which flow into the Po River.

From a geomorphological perspective, several types of waterways of the large Po River basin can be identified. In simple terms, it is possible to distinguish the tributaries which originate from the Alps from those which originate north of the Apennines. Those emerging from the Alps have regularly flowing water pathways, especially if we take into account the regulatory function of lakes in the Prealps. The majority of these rivers are also fed by glaciers, which ensure an abundant flow during the summer months. In the plateaus, the river tributaries of the Po (left bank), before converging, flow in very varied paths and generally widen into braided channel. With respect to the rivers starting in the Apennines, there are no glaciers supplying seasonal water thus meaning the summer suffers much drier conditions.

Besides the Po River with its tributaries, in the Venetian and Friulian Plains another river system must be taken into account. It is made of basins of autonomous drainage where we can identify a number of tributaries as even the smallest waterways have their own mini basins with specific characteristics often shaped by the evolution of human activities over time. Between the high and low sectors of the plain, the so-called *linea delle risorgive* or *zona dei fontanili* (line or zone of springs) provides an important water source for hundreds of thousands of people. The geomorphological diversity is furthermore enriched by the presence of a significant number of Prealps lakes which originate from glaciers and offer favourable environmental conditions for permanent settlements.

The complexity of the hydraulic history is well documented thanks to the immense number of historical records and maps which illustrate the importance of traditional water management with a careful attention on flood control, marsh drainage, construction of canals for navigation and irrigation. From the middle of the 16th century, the construction of water landscapes was closely linked with the expansion of farm lands. This resulted in new ways of territorial management, favoured by an improvement in the techniques for draining wetlands.

Between the Age of Enlightenment and the French Revolution the traditional and prestigious French hydraulic engineering system was reorganised to satisfy the needs of a modern nation which

was eager to have a territorial system capable of guaranteeing the implementation of economic activity and decent living conditions. Inland navigation, irrigation, drainage, flood control, watermills, roads and bridges were the essential aspects to be discussed. It is truly interesting to observe that in the area of Veneto, the picturesque aesthetic seamlessly connected with the local tradition of artistic representation of river landscapes in paintings and engravings, especially during the last century of Venetian dominance, with an exaltation of daily life on the riverbanks. From this it can be deduced that the construction of water landscapes, especially in the Lombardy and Veneto regions, depends on the tight connection between hydraulic technology and an elaborate perception of the beauty of water landscapes.

After the Second World War, however, the water landscapes in the Po Valley suffered strong urbanisation which brought about a drastic physical change. The most worrying consequences of land usage are the irreversible and permanent damage from soil coverage which is vital for fundamental ecologic relationships. Indeed, it impedes the natural absorption of rainwater, alters temperatures, changes the living environment and subverts the traditional urban-rural dichotomy.

In the 1950's and 1960's a severe blow was struck to the traditional heritage and symbolic imagination of the Po Valley when a rapid transformation of the perception of the environment reduced people's interactions with the local waterways. This decrease in public appreciation for rivers went hand in hand with the deterioration of water quality. The death of fish, illegal dumping, swimming bans, the often abusive extraction of aggregate in river beds and, above all, the residents' disinterest, reaffirmed a rupture in the traditional relationship.

Nowadays new tendencies and attitudes are on the rise which promotes regional activities allowing more conscious relationships between society and hydrographical networks. The spread of the ecological consciousness is giving rise to "niche" technocracy sectors and stimulating alternative visions and projects. This spontaneous and collective plan of new consciousness largely results from the catastrophic future scenarios painted by influential international work groups, such as the Intergovernmental Panel on Climate Change (IPCC). It also integrates with an attention on local studies closely related to environmental conditions of the place.

A brief look at the European Water Charter (proclaimed in Strasbourg on 6th May 1968) illustrates that at the time conditions for the use of water resources had already been well established: water is not inexhaustible, once used it has to be carefully treated in order to be reused, it is a common asset and the administration must write up water management plans, and, most importantly, scientific knowledge needs to be disseminated in order to

create awareness among the public to protect water resources.

In the last decades of the 20th century, the first examples of water consciousness were witnessed in some communities in the Po Valley. This was brought about thanks to non-academic scholars, with a passion for local history, who left the classrooms, archives and libraries to explore the region. This committed fieldwork demonstrated the degradation of waterways and historical constructions, as well as illustrating the divide between inherited water culture and people's perception of the river. Among the multitude of examples of water consciousness which could be mentioned, it is worth remembering some important ones from the 1980's: The case of Pavia with its recovery from the Naviglio Pavese Canal, or Padua and the social struggle to decontaminate the Tronco Maestro (an urban canal with medieval origins) and other experiences events in Treviso, Ferrara, Lodi and Turin. Therefore this initial impulse phase to recover and divulge river histories was substantially an urban phenomenon, from which two significant motivators emerged: a cultural motivator, considering waterways as subjects of advantageous study as well as repository of historical and environmental assets; and a recreational and sportive one, underlining the potential for leisure at these bodies of water, not only for activities on the water but also for going on excursions along the banks. At this time, however, there was a lack of adequate legislation in so far as the European Water Charter only made general statements which no local administration took into consideration.

The conceptual step from "good water quality" to "good ecological status" emerged in the proposal presented by the European Commission in February 1997 which set 2015 as the deadline for the completion of general sanitation of water in Europe. This ambitious challenge was reaffirmed at the Aarhus Convention in 1998 which also established the principles of environmental justice and access to information and, most importantly, foresaw the participation of citizens in the decision making processes. It was therefore this combination of indicators which aided the writing of the Water Framework Directive approved on 23rd October 2000 by the European Parliament.

In the project to recover ecological quality in the vast hydrographic system of the Po Valley, one must also take into consideration the richness of cultural sediments which constitute the many typologies of river landscapes. These inherited values are not limited to tangible characteristics from physical objects but include the complex heritage made up of immaterial objects and cultural representations. In this manner the methodological lines to define authentic *hydraulic humanism* are set. This hydraulic humanism is combined with technical valuations and more traditional quantitative descriptions, thanks to the use of cultural, literary and pictographic iconogra-

phy along with oral traditions in order to stimulate other perceptions and encourage a more complete sensory behaviour.

In order to obtain a profound understanding of the territorial integration of the hydraulic system (as well as any other territorial process) the geohumanist approach is based on subjective perceptions which, in the case mentioned here, can be considered essential for the harmonious management of water landscapes. In order to spark more interest, the processes of participative governance must be tackled from archetypes of environmental perception with the conviction that running water is a universal attraction linked with physiological mechanisms innate to hydrophilia, very similar to topophilia and biophilia, which is to say affinities that come naturally given our biological origins, and are related to the strategies for evolution and survival. Therefore, flow aesthetics, which is easy to evaluate thanks to multiple analyses of environmental psychology, is key to obtaining wider participation from society, beyond the practical, obvious and banal characteristics of the ephemeral needs of the interested parties (the so-called *stakeholders*). Nonetheless the construction of a conscious territoriality requires not only reading far beyond visible layers but also more accurate insight from a new generation of explorers of everyday locations.

Since the 1980's, we can observe a gradual consolidation of a new sensibility towards the elements of cultural and historical heritage, particularly in the hydrographic sectors. The current collective perceptions show a renewed interest for river landscapes, even though territorial political decisions appear not to welcome the most innovative dynamics nor the most appropriate paradigm for efficient territory management. From an emotive link with the place, initiatives of activism and collective participation would have to be put forward because the current political class does not yet have the cultural instruments nor the sensibility needed for efficient water, air and land management. Every stream, canal, irrigation channel and mountain stream plays its part in the local system, and therefore has a symbolic power to remind a community of the importance of considering construction of a landscape, of each landscape, as an act of responsibility and respect for future generations.

Hydroelectric energy and the transformation of the pyrenean landscape

Arcadi Castelló and Eva Perisé

Water landscapes are the perceptible result of the dynamic combination of physical and human ele-

ments that transforms the combined product into a constantly evolving social and cultural framework (Ribas, 2007). In the case of Pallars (Catalonia), we find the most conspicuous combination of these elements in the hydroelectric industry which was to transform the Pyrenean landscape and economy during the first decades of the 20th century.

While different studies have analysed the history of this activity and its socio-economic impact on Pallars, fewer studies are available from a heritage perspective and even less so from a landscape approach. This chapter aims to provide an initial approach to these disciplines in order to contribute towards establishing their methodological bases and contents, as well as interpreting the results of research into a phenomenon which has had a particularly decisive effect on the economic transformation and on the changes to the physiognomy of the High Pyrenees.

This region, and Pallars in particular, played a key role in the industrialisation of Catalonia, specifically in the period referred to by some historians as the *second leap forward*. The use of the abundant hydrological resources of these territories in the production of hydroelectric energy, in addition to technical advances such as the emergence of alternating current in particular, which meant that energy could be transported long distances, gave a significant boost to the industrialisation processes that were already growing in force in Barcelona and its interland.

Pallars is thus situated in a new model of development that structures the territory on the basis of productive specialisation, with a centre focused on the production of goods and services, and a periphery that provides it with the most important resources, such as manpower and, above all, the energy needed to illuminate homes and public spaces and, in particular, to feed the manufacturing activity of the emerging industrial sector.

During the 1920s, Pallars Jussà became the productive epicentre of a new source of energy that was clean, easy to transport and economic, and that was to replace the most commonly used energy source up to then, coal, which was mainly imported. The physical and geomorphological characteristics of the Pyrenean and Pre-Pyrenean territory meant that the exploitation of this energy source, with the use of different production techniques (reservoirs, river diversion dams, waterfalls), was particularly intensive in Vall Fosca and Conca de Tremp. Pallars thus enters into a dynamic process of change that is to have a profound effect on its economic and social future, modifying its role in the scheme of territorial productive specialisation, while also transforming its landscape.

The hydroelectric industry thus bursts onto the scene in the early 20th century, just when agrarian Pallaresa society was undergoing a severe crisis brought on by drought and the phylloxera plague. Hydroelectricity brings with it a new economy and

new ways of living (salaries, schools, leisure time, etc.), whose impact has only just started to be analysed and evaluated with scientific rigour over recent years. It was not until the nineteen eighties that the working bases of analysis and of the historical and social recognition of these events started to be established. And it was not until the year 2012 – 100 years after the production of the first kilowatt – that studies began to emerge focusing on the territory from an interdisciplinary perspective, including heritage and landscape.

The heritage status of hydroelectric industry in Pallars

The valorisation of hydroelectric heritage is a line of research which is currently being developed in the Pallars Jussà county; an area of Catalonia in which hydroelectric plants have a particular presence and have left a significant mark.

For some time now, different local initiatives have emerged, aimed at promoting hydroelectric heritage as an “incipient heritage”, located in a rural-mountainous environment: a heritage which is a priori “cold” and far removed from the traditional industrial spaces upon which the idea of classical industrial heritage has been built, but which nevertheless has its own personality, with an intense presence of elements across the territory that are impregnated in it and that give it its unique identity, whether these be elements linked to hydroelectric activity in a direct way (dams, tunnelling, plants, piping, high tension towers, cable cars, encampments, residential buildings, etc.) or indirectly (new spaces of urban growth, schools, cafés, etc.). This points to an extensive relation of elements that could be attributed with heritage status, compelling us to open up a debate in need of urgent attention: what should we preserve and what do we want to preserve?

Today, we can find some examples of the hydroelectric industry in Pallars that have already acquired heritage status. Firstly, the Capdella Hydroelectric Museum in Vall Fosca, created in 2001. Its opening was preceded by a considerable amount of work involving the inventorying, recovering, restoring and curating of the installations, materials and spaces linked to this productive activity: a complex and ambitious task driven forward by the Town Council of Torre de Capdella. The museum is part of the Territorial System of the National Museum of Science and Technology of Catalonia. Secondly, we find the initiative promoted by the Town Council of Lladorre, in Pallars Sobirà, initiated in the early nineties to promote the area’s abundant hydroelectric heritage through an Interpretation Centre showing the different systems employed when using water to produce electric energy, and including a visit to the installations of the Tavaskan Plant, excavated in the mountains and inaugurated in 1974.

How to focus an analysis of the transformation of the Pyrenean landscape

It is only now, 100 years after the start of this activity, that initiatives aimed at raising awareness of the history and value of Pyrenean hydroelectric heritage are being promoted from the local sphere, beyond the field of mere scientific research. Just over five years ago, a scientific commission was created to organise the commemoration of the centenary of the start of hydroelectric activity in Pallars. This turned out to be the backbone of the initiative involving the recognition and reclaiming of Pyrenean hydroelectric heritage and landscape.

The second element worth highlighting in the construction of this line of research is related to the legal regulations on landscape, particularly the Catalan Law on the protection, management and planning of the landscape (2005) and the main instruments used to ensure its application: the Landscape Catalogues. This law defines the landscape as "any part of the territory, as perceived by the people, whose characteristics are the result of the effects of natural or human factors and the relations between these factors"; a definition which coincides entirely with the context analysed here: water, an abundant natural resource within the Pyrenean mountain range which offers a relief that favours the construction of large reservoirs and strategic productive activity for the economic development of the country.

The Landscape Catalogue of Alt Pirineu i Aran, approved in April 2013, identifies and characterises the hydroelectric landscape as one of the most significant anthropised landscapes in the Pyrenees, introducing interesting concepts such as cryptolandscapes which are characterised by underground hydroelectric plants. The Catalogue also evaluates the impact and possible risks to the landscape, establishing landscape quality objectives in line with the results obtained in citizen participation processes.

In summary, all these provisions of the legal framework provide us with the methodological anchorage needed to advance in the dual task of scientific research and dissemination. While landscape analyses focused on water are becoming increasingly prominent – with this publication providing one such example – contributions which study the industrial use of water and its effects on the landscape are still rather scarce. On the contrary, and to our knowledge, up to now no rigorous studies have been carried out on Pyrenean hydroelectric landscapes.

On the other hand, a landscape analysis of this territory must also take into account other economic dynamics that have also left their mark on the area, such as the agrarian crisis produced by the phylloxera plague of the first ten years of the 20th century, the reforestation policies promoted by Franco's regime, as well as the mechanisation of farming and the industrial boom of the nineteen sixties, two facts that, taken together, exacerbated the depopulation of the Pyrenees, leaving fields, terraces and pastures barren.

It is worth noting that hydroelectric activity also has an impact on other economic sectors which also generate new landscapes. Among these sectors, it is worth mentioning tourism in particular. The reservoirs of the Mediterranean Pre-Pyrenean territory have provided the setting for the first non-Alpine forms of tourism, practiced by tourists in search of the ideal binomial of sun and beach, but in settings which are more mountainous and also more peaceful than coastal ones.

The landscape transformations produced by the hydroelectric industry are intense and visible across the territory. On the one hand, this industry depends on the construction of large infrastructures needed both for the production of energy and for this energy to be transported to urban areas where it is consumed in high volumes. The dams involved in these processes flood a considerable part of the farming land, and this new irrigated land promotes the appearance of new infrastructures, thus resulting in the alteration of the traditional agrarian landscape. While the implementation of this industry does not result in the water logging of any of the territory's towns, it does modify the local economies of those areas in which the water swallows up their most productive agrarian space, provoking an irreversible process of abandonment.

The final result is that of a unique Mediterranean rural landscape where it is easy to observe the (superimposed, combined, opposed) traces of human activity, in which arid mountain ranges co-exist alongside masses of water; hawthorn pastures and other tree species that invade abandoned farming land; high tension towers alongside bell-towers, and terraces with their eroded slopes.

The hydroelectric landscape, understood as the interrelation between natural and anthropised elements, shapes a good part of the Pyrenean landscape on a much greater scale and with more intensity than we may have imagined. In most cases, and to a greater or lesser extent, valleys, rivers, lakes and marshlands – key elements of the "natural" Pyrenean landscape – are shaped by hydroelectric activity. One of the most significant icons of the Pyrenean landscape serves as a good example of this: the setting made up of the Sant Maurici Lake and the Massif of Els Encantats, the most representative space of the only national park in Catalonia, which is dominated by the powerful forms of granite and the pine forests shaded by the intense blue of the lake's waters, which were harnessed in 1954 to feed the hydroelectric plant in Sant Maurici.

Planning for the Catalanian water basin reservoirs

Jordi Agustí

From a hydrological planning perspective, Catalonia is divided into two sectors: Firstly the sector containing Catalan water basins known as the river basin district of Catalonia (managed by the Catalan Water Agency), and secondly the Catalan sector of intercommunity and international basins (tributaries of the Ebro, Garona and Sénia rivers) managed by the Hydrographic Confederations of the Ebro and the Júcar.

The Catalan Water Agency (ACA), founded in 1998, is a public company affiliated with the local government's Department of Territory and Sustainability. Its function is to plan and manage the complete water cycle in Catalonia.

The hydrological planning of the river basin district of Catalonia was created in accordance with the Water Framework Directive. It includes several plans and programmes that define the objectives to be reached in the organisation and management of water resources, as well as establishing the measures and actions ACA needs to undertake so as to fulfil said objectives. The hydrological planning of the river basin district of Catalonia is made up of four instruments: the management plan, the measurement program, the control and monitoring procedures, and the specific plans and systems.

At present the ACA manages sixteen dams within the Catalan water basin system with a storage capacity of 700 hm³ as well as almost 500 water treatment plants which guarantee sanitation of waste water from approximately 96% of the Catalan population. It also monitors water environment throughout the region by means of an array of inspections and procedures.

In Catalonia, the main reservoirs within inland basins were built between 1949 and 1998. The construction of this infrastructure leads to great changes in the location area and landscape. These alterations are mainly environmental (an increase in water levels by a few metres, the requirement to build access roads, power lines etc.) but also social (depopulation, houses being knocked down, a feeling of sacrifice for the benefit of the region) and economic (job creation).

These reservoirs were built to provide a variety of functions. Clearly the main and best known functions are for the control of floods and storage of water, but more recently in a new social and economic context, recreational uses have been added (principally leisure activities such as water skiing, canoeing, motorboats and swimming).

Despite those changes in use, the legislation in reservoir activities was, until relatively recently, heterogeneous and disorganised. It is for this reason that over the past few years the ACA has developed

a series of regulations and studies geared towards organising and regulating the recreational activities practised in these bodies of water.

In this regard, Resolution TES/1850/2012, 1st August was the first document to establish a classification of reservoirs, lakes and stretches of rivers in the Catalan water basin system for boating and swimming, in order to make recreational activities compatible with non-native wildlife, especially in the Baells Reservoir. In 2014 the restrictions were reformulated and the classification updated through approval of Resolution TES/2543/2014, 3rd November.

This new policy framework articulated by the ACA aims to generally regulate what can be done to incentivise leisure activities across sixteen reservoirs and twenty-three stretches of rivers. The new planning scheme unifies criteria, details contents, increases potential for use and establishes the policy framework to be respected in each instance. Hence the aim is to combine the traditional functions of reservoirs and rivers with tourist activities; continually maintaining water quality, guaranteeing the safety of persons and preventing the proliferation of non-native wildlife.

The Baells Reservoir (in Berguedà) was the first place in Catalonia to adapt to the regulation with the objective of becoming a tourist attraction and boosting the local economy. In June 2014 the Berguedà County Council, by virtue of the convention signed with the ACA, started a range of nautical activities such as rowing, sailing and motorboats as well as establishing swimming areas. It has also promoted activities providing education, awareness and publicity for the role and mission of the Baells Reservoir by, for example, offering a tour around the main facilities.

