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**TERRITORY
AND LANDSCAPE**

40 years, 40 reasons
Point 5 — Territory and landscape
INCASÒL 40th Anniversary
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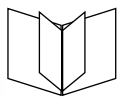
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CATALONIA ENJOYS THE TEMPERATE CLIMATE CHARACTERISTIC OF THE MEDITERRANEAN BASIN. THIS, IN COMBINATION WITH ITS LANDSCAPES THAT ALTERNATE BETWEEN PLAINS AND MOUNTAINS, GIVES IT EXTRAORDINARY TOPOGRAPHIC DIVERSITY AND GREAT BIODIVERSITY. BUT THE MEDITERRANEAN IS ALSO A DENSELY POPULATED REGION WITH A VERY FRAGILE BALANCE, SUBJECT TO GREAT PRESSURE FROM HUMAN ACTIVITIES.

The Mediterranean Basin is intrinsically prone to drought, forest fires, torrential rains and sea storms, but climate change can make this situation dramatically worse. There are many effects of global warming: loss of biodiversity, impoverished ecosystems, extreme weather, rising sea level, etc. Climate change will clearly condition our future and may put the economic model in some parts of our territory at risk.

Since its inception, INCASÒL has managed natural spaces, forests and agricultural land, and over these 40 years, has saved spaces with great ecological value from the pressure of urbanisation. Land management in a country where 7 out of 10 hectares are linked to human activity is a challenge for INCASÒL as one of the largest landowners in Catalonia. Preserving natural spaces, recovering deteriorated spaces and implementing new management models for open spaces, to maintain them and ensure their social and environmental sustainability, are some of the lesser-known functions of the Institute.

Catalonia is rich in landscapes and biodiversity, but poor in natural resources: we would need seven times the country's territory to generate everything we consume and to absorb all the waste we generate. So, we must change our consumption habits and be smart about how we manage the distribution of uses with such little land available. We must rationalise our use of water, a resource that is very scarce in Catalonia and can limit our growth. We must implement innovative energy-production models, make the most of available resources, such as forests, improving their management and making them less vulnerable to climate change. The energy transition is essential to reducing emissions and is the only way to beat climate change.

Catalonia, although 30% of its surface area is used for farming, has a shortfall in terms of the food we consume. Bringing agricultural production closer to cities could improve the quality and management of the open spaces around them, encourage their social use, lower transport costs, and help raise awareness of the need for more

responsible consumption to take into account the cycles of nature.

Rationalising our consumption habits is key to achieving a sustainable development model for future generations. But to mitigate the effects of climate change, we must create a natural network that can offset the negative impact of human activity. To do so, we must put landscapes and natural elements at the core of our efforts to structure activities in our territory.

The whole territory is landscape, and all citizens have the right to enjoy it. Historically, we've seen the space outside of cities as empty and often deteriorated. Now we understand that the space between towns and cities has enormous potential: for producing food and clean energy, for contributing wellness, health and biodiversity to urban environments and the territory as a whole, for helping us mitigate the effects of climate change and offset the impact of human activity.

Catalonia, like the planet as a whole, is in ecological debt: humanity consumes 50% more resources than the Earth is able to replenish. Therefore we must be aware of the values and limitations of our small country, which is extraordinarily rich and diverse but also extremely fragile.

TERRITORY AND LANDSCAPE

Some years ago, eminent Dutch sociologist Saskia Sassen gave the inaugural conference at the International Biennial of Landscape Architecture in Barcelona. Her conference focused on the evolution of two terms that are often used together: 'territory' and 'landscape'. According to Sassen, the two words have evolved in opposite directions: while the term 'landscape', in its contemporary meaning, has become an extremely deep and complex umbrella concept, 'territory' has been emptied of meaning and trivialised to the point where it can no longer be used on its own. The term 'territory' is defined in the Oxford English Dictionary simply as a political division: "An area of land under the jurisdiction of a ruler or state". The second entry is for a more mercantile meaning: "An area in which one has certain rights, or for which one has responsibility regarding a particular type of activity". For the word 'territory' to really take on meaning, it needs an adjective and, therefore, there isn't a single territory linked to a space. Quite the contrary, territories overlap in the same space, and for Sassen, that makes it impossible to define a place as a 'territory'.

Political conventions, often random administrative divisions overlap in the same space defined as a territory, each with its own perimeter and all having little or

nothing to do with the real place. On a hill near my home, several different territories overlap: global, Mediterranean, European, Catalan, county, local, green, non-developable, etc. Furthermore, 'territory' is a concept used as a political fragmentation strategy and allows for the use of intentionally oppositional language that is essentially false: the term 'local' is seen as the opposite of 'global', 'national' of 'international', when local territory is also global, and any national territory is also international. Perhaps the most imprecise use of the term 'territory' is when it is used as the opposite of 'city', as in this case, territory is an indeterminate place without limits, excess and existing only in undefined opposition to the city, which it is external to.

When we talk about 'developed territory', 'developed' contains all the meaning and 'territory' only tells us there are limits. When we say 'Catalan Ministry of Territory', what we really understand is 'the ministry in charge of the space defined by political limits that Catalonia currently occupies'. Without more information, we wouldn't really know what this ministry actually does. Perhaps this is why, in the past, it had a more accurate name: 'territorial policy' or 'territorial planning'. So, what we will look at in this focal point is the landscape of a territory delimited by the adjective 'Catalan' (corresponding to the political



View from the viewpoint of Puig de la Font Pasquala. Fontanilles, Baix Empordà. In the background, the Pyrenees



limits of Catalonia), without forgetting that landscapes are not delimited by administrative divisions or that the effects of the dynamics we want to explain are based on the logic and limits of the landscapes, not the territory. When we speak of 'territorial planning' and what we want to plan is more than its administrative limits, it would be more accurate to say 'landscape planning'.

"If we give the word 'landscape' a complex meaning, that comprises plains, forests, bodies of water, industries, mining, agriculture, housing, transport, etc., we'll say, with modern urban planners, that the city of tomorrow should only be one more element of the landscape. Beyond this landscape, beyond a country, there can be more than one large city. Each of them is no more than an element of the landscape. Surely, if an extensive territory has no more than one large city, the centre of attention, there won't be a lack of important cities at some distance from the main one, as well as towns and places with life of their own. Each of them is an element of the country, as are the rivers, mountains and orchards: elements that must have mutual relationships."

Nicolau Maria Rubió i Tudurí, *La qüestió fonamental de l'urbanisme: el país-ciutat*, 1926.

'Landscape', on the other hand, is a much more complex, multifaceted term. Once a place is defined as a 'landscape', no other definitions can be superimposed. The landscape contains the DNA of the place and unequivocally defines it. Landscape, furthermore, establishes its own limits with observable, measurable criteria, quite unlike the discretionary, subjective borders that define a territory.

The evolution of the term 'landscape' is highly complex and revealing, as it has incorporated changes in how our society perceives and relates to nature and the geographic spaces around us. Landscape (according to Oxford) is "All the visible features of an area of land" or "A picture representing an area of countryside". The mere fact that the definition contains the same root word shows how difficult it has been to establish its meaning. In fact, at some point, this definition was completely supplanted: landscape is no longer just a static view of a physical

space, appreciated for its beauty, which can be conveyed through painting or photography, as if it were a postcard. This first, picturesque meaning of landscape is still in use, with the positive connotations that still accompany the term 'landscape', linking it to the idea of beauty inherent in nature.

But the term 'landscape' has many other meanings: from the beginning of civilisation, landscape and the natural and geographic elements that comprise it have had a symbolic dimension. The first pre-religious or animistic expressions gave heavenly bodies and elements of the landscape magical powers and assigned characteristics and personalities to them through mythification or deification. Still today, mountains, rivers, stones, trees and whole landscapes contain ancestral properties, mythological, legendary, religious or magical, all over the planet: the Ganges, the Himalayas, Mt. Fuji, Mt. Olympus, etc. Here at home, Montserrat is a clear example. Sometimes, the iconic image of the landscape becomes part of our collective imagination, like man-made monuments: Sugarloaf Mountain in Rio, Uluru (Ayers Rock) in Australia, etc. There are images we identify with a region or city. As a result, the landscape can also be part of a country's heritage, if we understand 'heritage' as a series of natural or man-made elements that society grants positive values, tied to its history, culture or identity.

In the 18th century, some cities grew large enough that their inhabitants no longer had contact with nature on a daily basis. In these same cities, the less-fortunate classes like the proletariat were forced to work marathon shifts, often without any rest days. These same workers, many from the countryside originally, spent most of their lives in extremely dense, insalubrious neighbourhoods that had lost any contact with nature. These paintings or representations of idealised images of nature became souvenirs, images that brought back nostalgic memories evocative of a far-off reality. Never before in Western painting had landscapes been a central theme, and only the loss of nature as a reference in urban environments and the physical and mental distance large cities imposed led to landscape as an idealisation, a pictorial image, simplified and evocative, referred to in artistic terms as 'picturesque'.

Human beings have always shaped nature to make it more habitable, more adapted to a human scale. This transformation is the result of our need to survive, but also to enjoy. Gardens, in all cultures, are a controlled, humanised expression of nature. In the 18th century, when the city became an autonomous, unconnected organism, the idealisation of this view of landscape led to the birth of landscaping in England. This was the new art of gardening that sought to modify the landscape, adapting it to our idealised image of what it should be. Like gardening, it creates an adaptation of nature based on an intellectual and cultural construction. Capability Brown began building landscapes according to the norms and idyllic images in landscape painting, and the term 'landscaping' was coined for this new way of planning free space, with intentions and effects that went beyond the garden. This way of designing open spaces can be considered picturesque: it is about planning and domesticating the landscape to recreate our idealised pictorial image of it. It is how cities, especially in the Anglosphere, approached construction of their first urban parks: an idealised fragment of nature amidst the urban density.

These pairs of terms, land/landscape and country/countryside, share the same root. As we've seen, landscape is full of symbolic dimensions and defines culture and forges both collective and personal identity. Paradise, for each culture, is no more than an idealised image of its landscape: paradise in the Middle East is a desert oasis, while in Central Europe it is a sunny meadow. This image is built up through art, but also the written word, religion, philosophy and literature. In Catalonia, the cultural construction of landscape, in the contemporary sense, began taking shape during the Renaissance. That was when, with the desire to create a national archetype, history, language, and landscape appeared as pillars of the Catalan identity. Great poets that have captured the character of a people or a nature have often used landscape as a metaphor for their identity: Verdaguer and Maragall are some of our national landscape poets. Landscape also plays a key role in building the idea of a nation, as the keeper of the people's immutable values. In this cultural and moral construct, the mountains (equated with the landscape or countryside, far from the city) are an idyllic place that preserves and embalms virtues, the quintessence of



↑
Joaquim Vayreda: *Summer*
(1877). Museu Nacional d'Art
de Catalunya (MNAC)



identity, and takes on a nearly mythological dimension. At the opposite end of the spectrum, the plains, Guimerà's Terra baixa, are equated with the city. The mountains and their inhabitants represent values that, once a conception of the city has been created, are defined as the opposite: virtue and vice, essence and artifice, honesty and hypocrisy, stoicism and triviality, etc.

Landscape and how we relate to it is a key part of our social structure and how society is rolled out and occupies its territory. Anthropologically, the basic organisational unit of society is that which needs to cooperate to feed itself, and this is closely tied to the fertility of its land. In the Mediterranean, a family unit with a garden and a pen can have enough to survive. So, each family can be autonomous and provide for itself, meaning this is the unit around which society is structured. In northern countries, however, the harsh climate and scarce yield from the land mean more people must cooperate to provide for themselves. Often, the family unit isn't enough and decisions for survival are structured around a clan or tribe. Inevitably, this ancestral condition must affect how each society is organised, as since time immemorial each people, each society has organised itself to modify the landscape and get resources and food from it. A society needs the landscape to grow and prosper, and that remains true to this day.

The landscape overlaps a series of systems in which physical or mineral elements combine with biological (the biophysical mould) and man-made ones. All these systems establish a series of highly complex exchanges and chain reactions called, as a whole, its 'metabolism'. For human beings, the landscape is the physical space that embraces them, but also a resource: it directly provides raw materials and, through technology (from the most basic types, such as agriculture or livestock farming), hosts human life. But the landscape goes far beyond providing food and raw materials: it is home to the settlements and infrastructures that make society work, and it is a direct asset for the economy and regional development, for example, through tourism and the agrifood sector. The ties between agrifood products and the landscape it comes from, such as the Protected Designations of Origin, give it value added and ensure quality, and social and environmental responsibility, localising the product. Moreover, it can be a driving force

for local economies and helps manage and preserve the landscape. In INCASÒL actions, wherever possible, preserving the productive value of the landscape is made compatible with attracting new production activities with ties, for example, to industrial activities. Both for tourism and agrifood production, in order to maintain and make the sector sustainable, it is essential to keep the landscape in good conditions, ensure its quality and implement policies geared towards preserving it.

In countries like ours, the landscape has been modified and anthropised since ancient times. As a result, natural spaces (natural in the sense of not having undergone a recognisable human transformation) are practically non-existent. Landscapes aren't static: in human adaptation and modification of them we also find their definition and identity. Change is consubstantial with the idea of landscape and, as we will see, its preservation must always take into account the possibility of transforming it to meet new needs. So, we must establish its immutable values, those that, regardless of the changes, must be maintained in order to preserve its identity.

Today, society's care for its landscapes is a way to measure its maturity and civic-mindedness. Over the past decades, a series of regulations and laws have recognised the social significance of landscape. UNESCO was one of the first international organisations to recognise the heritage and cultural value of landscapes, through the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage. This text defines natural heritage in terms of beauty, symbolic significance, and biodiversity, and adds the concept of 'cultural landscape' or "the result of people interacting over time with the natural medium, whose expression is a territory perceived and valued for its cultural qualities, the result of a process and the bedrock of a community's identity." In many later UNESCO texts, this definition has become more sophisticated and extensive, adding many landscapes to the list of World Heritage Sites. In Spain, the island of Ibiza, the Serra de Tramuntana, the Gardens of Aranjuez and the olive groves of Jaen are landscapes recognised as World Heritage.

The European Landscape Convention, passed by the Council of Europe in 2000, laid the groundwork for numerous regulatory and legal documents that have

progressively been incorporated in various countries and regions in the Union.

“Noting that the landscape has an important public interest role in the cultural, ecological, environmental and social fields, and constitutes a resource favourable to economic activity and whose protection, management and planning can contribute to job creation;

Aware that the landscape contributes to the formation of local cultures and that it is a basic component of the European natural and cultural heritage, contributing to human well-being and consolidation of the European identity... Acknowledging that the landscape is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas.

Noting that developments in agriculture, forestry, industrial and mineral production techniques and in regional planning, town planning, transport, infrastructure, tourism and recreation and, at a more general level, changes in the world economy are in many cases accelerating the transformation of landscapes;

Wishing to respond to the public’s wish to enjoy high-quality landscapes and to play an active part in the development of landscapes;

Believing that the landscape is a key element of individual and social well-being and that its protection, management and planning entail rights and responsibilities for everyone...”

Preamble to the Council of Europe Landscape Convention, 2000.

Also in 2000, the Parliament of Catalonia expressed its support for the principles and criteria of this convention as a preliminary step towards approval of the Catalan Law for the Protection, Management and Planning of the Landscape, of 2005. One of the outcomes of this law was the creation of the Landscape Observatory of Catalonia and drafting of the Landscape Catalogues, which we will look at in following sections.

Landscape has also become an increasingly autonomous academic field, as recognised in the new university curricula: previously, landscape had been a specialised field of study for masters or postgraduate degrees, but now it has a separate four-year undergraduate degree, offered jointly by the faculties of Architecture and Agricultural engineering. This recognises landscape’s capacity to be a wide-reaching scientific and technical subject that draws knowledge and methodologies from other disciplines but can also create its own.

Landscape, as a field of knowledge, is defined as the discipline that studies the relationships among territories, their biophysical mould and human use and occupation of these spaces. Therefore, to understand and act on the landscape, it is essential to understand the prior conditions or baseline of the spaces where the actions will take place: topography, geology, hydrology, climate and ecosystems (with their metabolisms), as well as the dynamics of use and exploitation derived from human activity and understanding the complexity of the connections among this series of systems in the physical space. To do so, we must apply concepts and analysis methods from ecology, biology, geology, agronomy, economics, geography, urban planning, anthropology, art and culture.





Vilassar de Mar. Vertical Landscapes
Photo: Ricard Vaqué. CC-BY-SA 4.0
Arxiu d'imatges de l'Observatori del Paisatge

CATALONIA: MOSAIC OF LANDSCAPES AND BIODIVERSITY

Catalonia, with 32,000 km², is the fifth-largest autonomous community in Spain, with a similar surface area to Belgium or Sardinia and Corsica combined. The region currently has a population of 7,566,000, making it the second most populated after Andalusia. The population density is 239 inhabitants per km², much higher than the European average (just 93 inhabitants per km²) but similar to that of Germany or the United Kingdom. 43% of the population (3.2 million) lives in the Barcelona Metropolitan Area, which is 636 km² and one of the most densely populated areas in Europe, with nearly 5,100 inhabitants per km². The population of the Barcelona Metropolitan Area is comparable to the conurbations of Manchester, Vienna, Lisbon and Brussels.

Catalonia is located in the Mediterranean Basin, which is the sinuous rim of the Mediterranean Sea that crosses three continents. The sea makes the climate mild all along the basin, which is fertile despite the scarcity of water. The temperate climate and the sea, as a space for coming together and sharing, have encouraged the establishment, rise and decline of cultures and empires over the centuries. The land in the Mediterranean

Basin, both to the north and the south, saw the birth of Western civilisation and, although there are different cultures that comprise it, there are commonalities among the different groups who live here: a tendency to prefer life outdoors, in squares and on streets, which become backdrops for humans to exchange goods and words, shaping collective life. The polis, the city, is the place where this civility crystallises and the Mediterranean is also the cradle of the urban and democratic culture that defines our civilisation. But the Mediterranean is also a densely populated region with a very fragile balance, subject to great pressure from human activities: prone to drought, forest fires, torrential rains and sea storms. All of that will become even worse due to climate change, which is already affecting the delicate equilibrium in our landscapes and, as a result, our lifestyle.

Catalonia is a country of mountains. A high percentage of the territory has a gradient of over 20% and in these spaces, human settlements and agriculture are very limited. The various relief units delimit a series of coastal or inland plains, where land pressure is great, and which are home to the majority of activity. The Catalan coastline is 700 kilometres long, with great landscape



The Serra del Cadí. Photo: Rafael López-Monné
Arxiu d'imatges de l'Observatori del Paisatge



value, but is also home to most of the population. Its occupation increased dramatically when, in addition to being home to a stable population, mass tourism demanded space be made for a seasonal population for which the beach and coastline is the main attraction. As a result, the Catalan coast is very densely populated: the coastal strip (100 metres wide) is highly urbanised, with compact pockets of population (towns and cities) and more sprawling occupation (single-family homes, hotels, and campgrounds). This occupation stretches over 340 linear kilometres, which is 59% of the coastline. Not counting the length of the Ebro River Delta, from Sant Carles de la Ràpita to L'Ampolla (112 kilometres), and Cap de Creus, from Cala Montjoi in Roses to Cala de Tamarit in Port de la Selva (50 kilometres), 81% of the coastline is urbanised. Finally, more than 40 kilometres are taken up by port facilities. In these areas, infrastructures (transport, water and sewage, electricity and even healthcare or law enforcement) must be scaled to fit maximum occupation, which makes urban and territorial management much more complicated.

The territories of Catalonia considered mountainous are laid out in Law 2/1983 on the high mountain. This law defines which areas are mountainous and divides them into mountain counties and mountain zones. In total, these areas jointly make up 46% of the total surface area of Catalonia, but their joint demographic weight is less than 5% of the population. As per the High Mountain Law, the following are mountain counties: Alta Ribagorça, Alt Urgell, Berguedà, Cerdanya, Garrotxa, Pallars Jussà, Pallars Sobirà, Ripollès, Solsonès and Vall d'Aran. The altitude, sloping terrain and climate of these territories clearly limit their economic activities. Mountain counties, however, have resources that are scarce in the rest of the territory of Catalonia, especially snow, pastureland, forests and natural spaces. Finally, these counties are characterised by their low population density, compared to the Catalan average, and as a result, public services clearly differ from the flatter, denser areas, where they are by definition more efficient.

The mountain counties occupy 9,560 km² and have a total of 163 towns, but there are more areas that, while not considered high mountain, do have sloping terrain that makes them unsuitable for large settlements. These

territories, which aren't just in the Pyrenees and their foothills, have orographic, demographic, economic, climate and social characteristics that are similar to those of the high mountain counties. In this regard, the High Mountain Law establishes a mountainous area to be a territory made up of one or more municipal areas that meet the following conditions: at least 65% of the municipal land located at an altitude over 800 metres above sea level; or having an average gradient of over 20% and 60% of the town lands over 700 metres above sea level. There are currently 137 towns considered mountainous regions, 124 of which are grouped into five areas: Montseny-Guilleries-Lluçanès, Prades-Montsant, Altiplans Centrals, Ports de Beseit and Montsec. The thirteen other towns aren't part of a larger mountainous region, as they aren't contiguous, and are called the 'isolated towns'. Paradoxically, the definition in the High Mountain Law puts some of these isolated towns right on the coast of the central Costa Brava. In total, mountainous areas make up 16% of the total surface area of the country and, in 2011, were home to 1.7% of the population of Catalonia.

Despite the intense human pressure that, as we've seen, is concentrated on the plains, this orographic and geographic diversity makes Catalonia a mosaic of extremely varied landscapes, a sampling of European landscapes in miniature. From the typically Mediterranean landscapes to the high mountains, from fertile plains to dryland farming, from wetlands and deltas to lush forests, etc. But this mosaic survives in a precarious equilibrium, subject to intense pressure and many threats, including climate change. This diversity, which is our great wealth, can gradually disappear over the coming years.

Tied to the landscape, Catalonia is home to a treasure trove of biodiversity we are often unaware of: with just 0.7% of the surface area of the European Union, it has 17% of all protected species and 42% of the habitats represented in the joint territory of the Union. Catalonia, for example, has five times more biodiversity than Germany, with 600 different habitats, 2,200,000 plant and algae species, 1,100,000 animal and insect species and 125,000 lichens and fungi. Despite intense transformation processes due to agriculture, animal

farming and industrial activities, and with a considerable population density that has expanded the urban footprint exponentially over the past two-hundred years, our natural heritage is still extraordinary. Catalonia also belongs to the European region with the highest percentage of endangered species: there are 259 species of fauna listed as endangered, 175 of which are vulnerable and 84, at risk of extinction. There are 12 species that have become reproductively extinct in recent decades. In terms of flora, there are 325 taxa of flora that are endangered, including vascular plants, bryophytes, lichens and fungi.

For many years, the Catalan people have been aware of this extraordinary natural and landscape heritage and social care and appreciation of the landscape as joint heritage has a long history in our country. Catalan civil society has demanded, in several moments of history, that landscape be recognised and protected as a key aspect of our heritage and identity. Through the efforts of several generations, today there is no questioning the value and protection of the landscape in social or political arenas.

Undoubtedly, the great leap forward in valuing the landscape in our country was when the Parliament of Catalonia joined the Council of Europe Landscape Convention, a milestone in laying the groundwork for a new culture and awareness regarding the landscape. The convention firmly states that the whole territory is landscape and all citizens have the right to enjoy a beautiful, clean, orderly landscape. The Landscape Observatory of Catalonia was created with this goal: to interpret, decipher, describe, and narrate the landscapes, natural, agricultural, industrial, urban and periurban, and understand their formation and evolution, observing their wide-reaching historic, aesthetic, spiritual, social and artistic values.

The Landscape Observatory of Catalonia, based in Olot, was designed as a centre of thought and action regarding the concept of landscape. Catalonia gave itself an institution that has allowed us to take our place in the field of analysis and scholarship on the contemporary notion of landscape. Today, the Observatory is a benchmark in scientific and technical research and its

prestige transcends our borders, as can be seen in its growing international presence and the advisory services it provides in countries like Sweden and Argentina. Its activity includes intense work to raise awareness, educate and study, with close ties to the university arena and extensive publishing activity. The Observatory is a benchmark in establishing methodologies and analysis criteria associated with the landscape and this expertise, obviously, is used for studying, assessing, and fostering knowledge of Catalan landscapes. This has given us innovative instruments that put not only the Observatory but the country as a whole on the global cutting-edge of knowledge, understanding and diagnosing its landscapes.

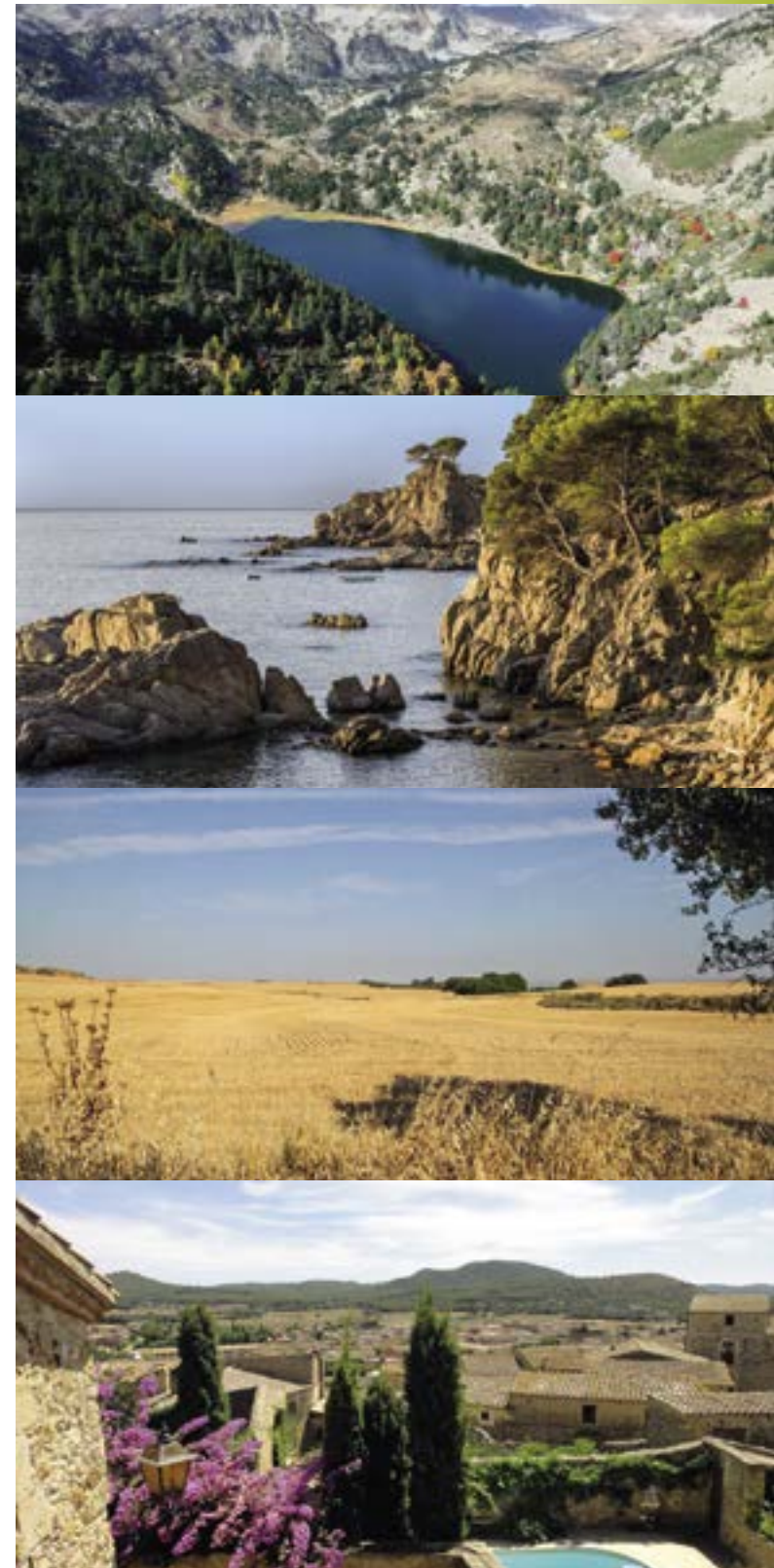
The application of all this methodological knowledge and analytical skill to Catalan territory has led to the drafting of the Landscape Catalogues (seven in total, one for each territorial area). These are an invaluable instrument that will not only allow us to deepen our knowledge of the country, but also make landscape criteria part of territorial planning.

Drafting the Landscape Catalogues has given us a map of the landscapes of Catalonia, which had never existed previously. With 134 landscapes, the map shows that Catalonia is a veritable mosaic of landscapes, given its diversity and wealth. This makes landscape prime heritage in our country, and only countries like the United Kingdom and France and some European regions like Wallonia have similar landscape maps.

The map defines the 134 landscape units as areas with the same landscape character that are defined by a series of elements that give them an idiosyncrasy that sets them apart from the rest of the territory. The map

Images of some of the landscape units:

Peaks and lakes of Aigüestortes and lake of Sant Maurici. Costa Brava.
The Ardenya Cadiretes. Ebro Delta.
Plana d'Urgell. Vall Cerdana.
Les Gavarres. Plain of Barcelona





encompasses all Catalan territory and, therefore, is not based on qualitative criteria. The landscape units don't necessarily include conservation actions but are geared towards preservation: our country is a territory marked and modified by the actions of humankind, which has built and shaped it over the centuries and will continue to do so in the future. The contemporary notion of landscape also includes change and adaptation as values. Defending the character of a territory isn't mutually exclusive with this landscape evolving, quite the contrary: it allows us to act and intervene in a territory in order to reinforce its identity by identifying the values that give it character without denying that change can add new ones. With the map of landscapes, a new layer of information or territorial reading is added, bringing quality and innovation to our urban planning. Beyond that, the map can be a tool for economic dynamisation and incentivise supramunicipal initiatives geared towards valorising a specific landscape and its produce or creating a tourism brand. The Consorci dels Aspres de l'Empordà, for example, bases its actions and values as a local catalyst programme on the landscape unit of Els Aspres.

"The multidimensional approach to the landscape takes the form of the multiplicity of values that characterise it. The catalogues are based on the existence of various values or types of values in the landscape (ecological, historical, cultural, aesthetic, symbolic), attributed by the agents who intervene in it and by the people who enjoy it. Any landscape can also have an 'existence value', attributed to it by people simply by reason of its existence, although not related with any use, either present or future. It shows an ethical relationship with the landscape and emerges from the 'defence of the rights of living beings', or from sympathy for certain elements which form it, such as animals in danger of extinction or fragile ecosystems, and not necessarily from an interest in keeping intact a resource for future generations ('legacy value')."

Landscape Observatory of Catalonia, *Criteria for making the Landscape Catalogues.*

The map of the landscape units of Catalonia is also a powerful educational tool to help Catalan society become aware of the landscapes where they live, of the importance of their natural, cultural, social, productive, symbolic, and identity-giving values, and also of their uniqueness and their risks. The map introduces terms that were previously only known on a very local level, like els Terraprimis, La Terreta, Lo Pas de Barrufemes and Els Xaragalls del Vallès, etc. In short, it can help us become more familiar and better understand our country, fostering a greater sense of belonging while opening our eyes to its extraordinary diversity.

The new urban planning law Catalonia is currently working on gives landscape a key role and, as we will see in the coming sections, the scale of landscape will become essential for integrating and making compatible the logics that regulate urban spaces with the rest of the functions and infrastructures that occupy the country. To do so, the great change lies in the concept and regulatory definition of open spaces.

“The new view of the territory that arises from this new territorial planning that, finally, after one hundred years we have been able to formulate without the limitations, shortcomings, contradictions and lack of conviction of the previous decades, gives way to a new way of doing things and of understanding urban and territorial planning. It gives rise to overcoming the interpretation of the territory in an essentially unidirectional way based on urbanity, and to understanding the ongoing interaction between city and territory as a new conceptual paradigm. [...]

Construction of the model, the matrix of the territory and the strategic elements that comprise it, must permeate all previsions and proposals for urban planning in cities. And furthermore, the city transformation processes will define the impulses that must be incorporated into territorial planning.

This new way of understanding and managing territorial and urban processes entails a break with the traditional dichotomy of urban planning and territorial planning, and implies a new, greater connection between the two.

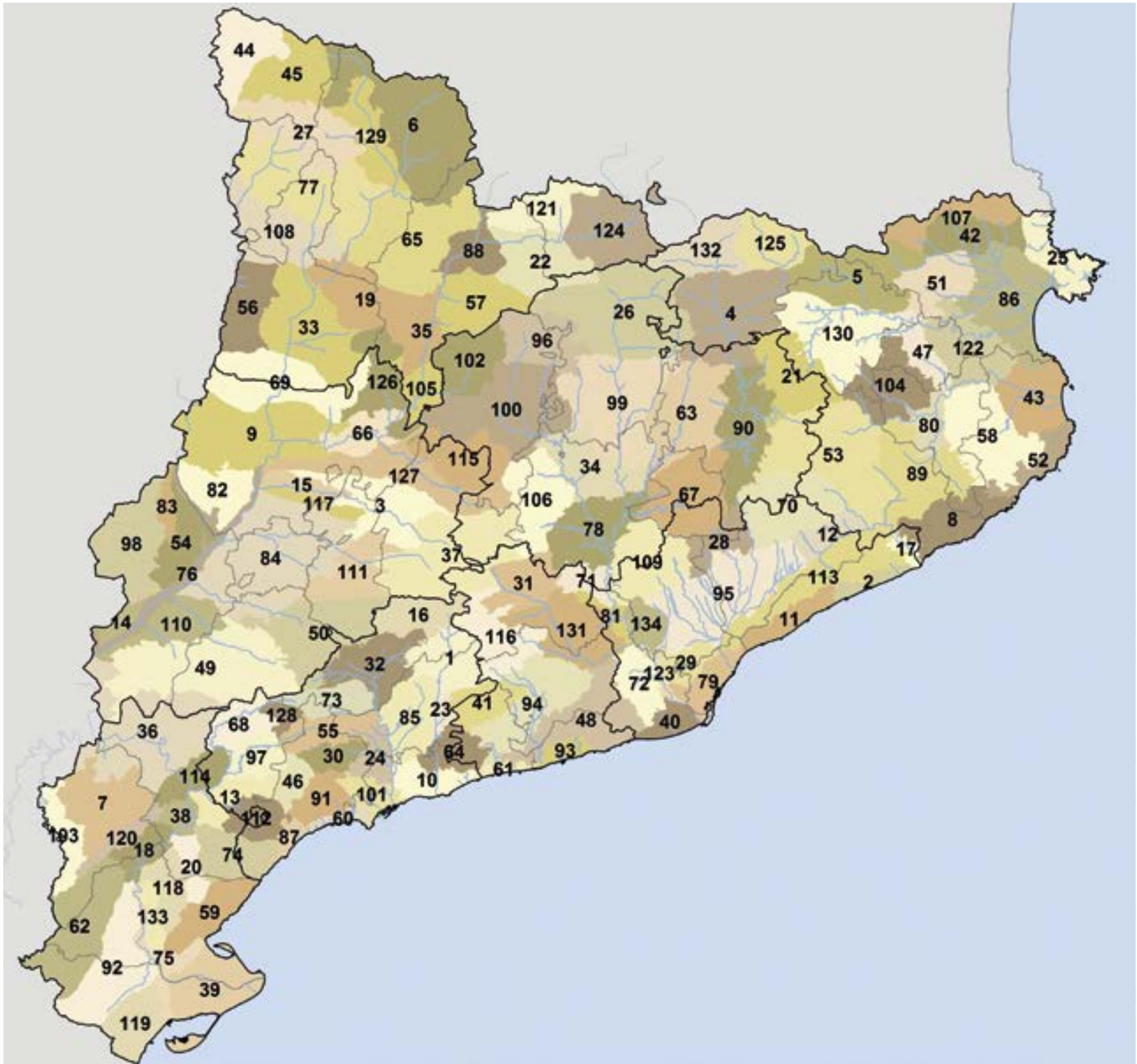
Overcoming these two viewpoints, previously too differentiated and specialised, with nearly exclusive dominance of the local over the territorial, entails the need for a new disciplinary and regulatory instrument.”

Agustí Serra, Ciutat, territori. Territori, ciutat, 2016.

1. Alt Gaià
2. Alt Maresme
3. Alt Sió
4. Alt Ter
5. Alta Garrotxa
6. Altes Nogueres
7. Altiplà de la Terra Alta
8. Ardenya – Cadiretes
9. Aspres de la Noguera
10. Baix Gaià
11. Baix Maresme
12. Baix Montseny
13. Baix Priorat

14. Baix Segrià
15. Baix Sió
16. Baixa Segarra
17. Baixa Tordera
18. Barrufemes
19. Boumort – Collegats
20. Burgans
21. Cabrerès – Puigsacalm
22. Cadí
23. Camps de Santes Creus
24. Camps del Francolí
25. Cap de Creus
26. Capçaleres del Llobregat
27. Cims i Estanys d’Aiguestortes i St. Maurici
28. Cingles de Bertí i Gallifa
29. Collserola
30. Conca d’Alforja - Vilaplana
31. Conca d’Odena
32. Conca de Poblet
33. Conca de Tremp
34. Conca salina
35. Congost del Segre
36. Costers de l’Ebre
37. Costers de la Segarra
38. Cubeta de Móra
39. Delta de l’Ebre
40. Delta del Llobregat
41. El Montmell
42. Els Aspres
43. Empordanet - Baix Ter
44. Era Baisha Vall d’Aran
45. Era Nauta Vall d’Aran
46. Escornalbou - Puigcerver
47. Estany de Banyoles
48. Garraf
49. Garrigues Altes
50. Garrigues Baixes i vall del Corb
51. Garrotxa d’Empordà
52. Costa Brava
53. Guillerries
54. Horta de Pinyana
55. La Mussara
56. La Terreta
57. La Vansa
58. Les Gavarres
59. Litoral del Baix Ebre
60. Litoral del Camp
61. Litoral del Penedès
62. Els Ports
63. El Lluçanès
64. Massís de Bonastre
65. Massís de l’Orri - Valls de Castellbò i d’Aguilar
66. Mig Segre
67. El Moianès
68. Montsant
69. Montsec
70. Montseny
71. Montserrat
72. Muntanyes de l’Ordal
73. Muntanyes de Prades
74. Muntanyes de Tivissa - Vandellòs

75. Paisatge fluvial de l’Ebre
76. Paisatge fluvial del Segre
77. Pastures de l’Alt Pirineu
78. Pla de Bages
79. Pla de Barcelona
80. Pla de Girona
81. Pla de Montserrat
82. Plana d’Algèri - Balaguer
83. Plana d’Almenar i Alguaire
84. Plana d’Urgell
85. Plana de l’Alt Camp
86. Plana de l’Empordà
87. Plana de l’Hospitalet de l’Infant
88. Plana de l’Urgellet
89. Plana de la Selva
90. Plana de Vic
91. Plana del Baix Camp
92. Plana del Baix Ebre - Montsià
93. Plana del Garraf
94. Plana del Penedès
95. Plana del Vallès
96. Port del Compte - Vall de Lord
97. Priorat històric
98. Regadius del Canal d’Aragó i Catalunya
99. Replans del Berguedà
100. Replans del Solsonès
101. Reus - Tarragona
102. Ribera Salada
103. Riberes de l’Algars
104. Rocacorba
105. Rodalia d’Oliana
106. Rubió - Castelltallat - Pinós
107. Salines - l’Albera
108. Sant Gervàs - Montcortès
109. Sant Llorenç del Munt i l’Obac - El Cairat
110. Secans d’Utxesa
111. Secans de Bellanes i d’Ondara
112. Serra de Llaberia
113. Serra de Marina
114. Serra del Tormo
115. Serrats de Sanaüja i Llanera
116. Serra d’Ancosa
117. Serres de Bellmunt i Almenara
118. Serra de Cardó - Boix
119. Serres de Montsià - Godall
120. Serra de Pàndols - Cavalls
121. Solana del Baridà
122. Terraprims
123. Vall Baixa del Llobregat
124. Vall Cerdana
125. Vall de Camprodon
126. Vall de Rialb
127. Vall del Llobregós
128. Vall del Silenci
129. Valls d’Àneu
130. Valls d’Olot
131. Valls de l’Anoia
132. Valls del Freser
133. Vessants de Tivenys - Coll de l’Alba
134. Xaragalls del Vallès



VALUE, MANAGE AND PROJECT OPEN SPACES

The state of a territory's natural and landscape heritage, the respect it gets and how it is managed, are inseparable from the identity, character, and culture of a country. It is an introduction to the outside world, a source of opportunities for citizens, and a central element of the welfare state. The right to the landscape (access, enjoyment and quality), with the right to housing and the right to the city, is one of the triad of social rights directly linked to the habitat.

Landscape today is an unquestionable source of regional development and wealth. Many free-time and economic activities take place outside of buildings and strictly urban environments. The pandemic has only increased people's desire to have a more regular, closer relationship with nature. In Point 1, we looked at the demand for new spaces and forms of nature in towns and cities, as well as the unquestionable need to improve their environmental quality. To achieve these goals, we must advance in integrating urban spaces with the open spaces that surround them, especially those under high urbanisation pressure, and to plan them, so they have room for society's new requirements: uses associated with sport and recreation, etc. Moreover, we must regulate, plan,

and manage all activities that, within the context of the green economy and the energy transition, must be rolled out in open spaces: generating clean energy, proximity agriculture and spaces to encourage biodiversity, etc. There are numerous business initiatives that take advantage of landscape resources in areas like agrifood products, ecotourism, environmental information services, interpretation and education, restoration of natural and cultural heritage, activities associated with leisure, sport and adventure, fauna observation, tourism and cuisine, etc. All of this and much more must find its place in the open spaces of our country.

Seven in ten hectares in Catalonia are home to uses associated with human activity. Taking into account that the plains are limited, free space in these areas is home to a wide variety of activities. The depopulation and abandonment of inland Catalonia is even more pronounced in mountainous areas and inland plains, while on the coast and central plains, empty space is an opportunity not a problem. The challenge is to keep them from being urbanised through proper planning of their uses with minimal impact and maximum rationality. This is why protection of open spaces must



Aerial view of the Aiguamolls de l'Empordà natural park and mouth of the Fluvià in Sant Pere Pescador



be done progressively and in coherence with their natural values: 32% of the Catalan territory has some degree of environmental protection, including natural parks, the Natura 2000 network and special birdlife protection areas. Outside these spaces, protection of nature and the landscape must be made compatible with new human activities, and INCASÒL is committed to both visions.

In managing protected spaces of great ecological value, INCASÒL plays a noteworthy yet little-known role. The Institute owns and directly manages estates within spaces with maximum environmental protection. Apart from its better-known tasks (like those associated with land development), the Institute also ensures the care and daily management of open and protected spaces. This is why, at INCASÒL, architects, engineers and urban planners work together with environmentalists, ecologists, agronomists and biologists. Sometimes, managing these spaces poses highly complex challenges in terms of their environmental (and economic and social) sustainability, which require the professionals working at the Institute to test innovative, imaginative solutions.

REASON 28 – WE MANAGE NATURAL PARKS, IMPLEMENTING PROJECTS THAT HELP PRESERVE THEIR VALUE

Catalonia's natural parks and protected spaces were created out of a desire to protect nature and biodiversity, but today they have a growing importance for territorial cohesion and socioeconomics. The network of protected natural spaces in Catalonia has 165 spaces of special ecological value protected under the Plan for spaces of natural interest (PEIN), with a joint surface area equivalent to 30% of the Catalan territory. Of these spaces, some have a higher level of protection: national parks, natural parks, natural sites of national interest and

nature reserves; in total, some twenty spaces. Their social value is undeniable: the income from the activities of the service sector in Catalan natural parks alone totals €181.5 million each year, which is 5% of all income generated by Catalan cultural heritage. The contribution of Catalan natural spaces, as gross value added, is €159 million, which is 1.26% of the gross value added of all tourism in Catalonia. In terms of the number of jobs generated, as a result of service sector activities associated with all the protected spaces, the total is nearly 4,000, with 1,500 of them being direct jobs. If we add to this the jobs directly involved in managing these spaces and the agricultural activities carried out there, the total rises to 5,200. In this context, it is important to note that each Euro invested in managing natural spaces generates €8.80 in gross value added in associated economic activities (not including the goods and services these spaces provide); and that is limiting our figures to protected natural spaces, not taking into account that many natural landscapes that aren't explicitly protected have high productive value and social prestige.

To continue looking at the socioeconomic importance of open spaces in Catalonia, and to give an example, rural tourism establishments in Catalonia saw 268,500 visitors and 453,600 overnight stays in 2015; by 2018 those figures were up to 503,000 and 1,260,000, respectively. The year-on-year growth for the month of August from 2015 to 2016 alone was 372% for bookings to do adventure sports in Catalonia. Organic farming has grown over the past decade, up 10% each year, and is now a key driving force for regenerating territories and maintaining our landscapes.

It is clear that open spaces (outside towns and cities) play a key social and economic role, and it goes without saying that they are also essential to the state of the environment. As a result, it is quite contradictory that we often speak of them as 'empty' spaces and that urban planning laws define them with a negative: open spaces are non-developable spaces. As we understand them today, in line with their social, environmental, and economic importance, this way of defining them is no longer acceptable.

Unlike the first years of INCASÒL history (before the new Government of Catalonia established its own legal framework), now the laws are very restrictive regarding open spaces, with numerous mechanisms to control what can be done there. This legislation was strictly necessary at a time when respect for the environment and the landscape, and their social value, couldn't be taken for granted. In the early years of INCASÒL, there was huge pressure on non-developable land in the plains and on the coast. This is still the case to some extent, but projects of the magnitude of the marinas at Empuriabrava and Santa Margarida (in Roses), in the heart of the Aiguamolls natural area, would be socially unacceptable. Point 1 explained how some of the Institute's first decisions, regarding the rural space in Gallecs for example, were a turning point in prioritising the value of landscape and nature over the unstoppable urban sprawl that characterised the final years of the Franco regime. INCASÒL has worked for years protecting natural spaces from development pressures: even in recent years, taking advantage of legal loopholes, there have been projects that proposed development that did not recognise the value of spaces that are essential for ecosystems to function properly and for the preservation of landscapes.

REASON 29 – WE STRIVE TO PROTECT, IMPROVE, AND EXPAND NATURAL SPACES

Urbanisation laws in Catalonia establish the allowable uses for non-developable land and which construction and specific uses must be approved by territorial planning committees before getting a municipal licence. A mechanism designed to better control activities and actions that take place in open spaces outside of towns and cities. In 2015 alone, a total of 1,045 agreements were

signed to authorise activities on non-developable land. In 2016, there were 1,286 (up 23%). This annual uptick had remained steady for the past decade and began to drop from 2018. Nevertheless, there is a clear upward trend in the number of activities on so-called 'non-developable land'.

If we assume that respect for the environment and landscape is widespread in society and that social pressure and increasing awareness regarding these spaces is a guarantee they will be preserved, the general opinion among specialists is that the time has come to make legal changes to open up the social uses allowed in open spaces, in order to allow them to change and evolve while protecting their value. With this new vision, open spaces as a whole must become a central, key part of territorial management and planning.

“The current legal framework is highly restrictive in terms of the uses allowed on non-developable land, which is why it guarantees neither sufficient enforcement nor proper territorial management. We need management programmes tied to planning, instruments that allow land to be expropriated on underutilised estates like in other countries, and surely to dare to allow non-agricultural uses associated with recycling and improving the existing stock of buildings and with managing estates, in order to make the economy serve the territory. In any case, we can look more closely at the criteria to concentrate transformation, prioritise recycling of buildings over new construction, or ensure facilities are taken down after the activity is finished.



The natural park of the Delta de l'Ebre from Sant Carles de la Ràpita. Photo: Jordi Salinas
CC BY-NC-SA 4.0
Arxiu d'imatges de l'Observatori del Paisatge



Administrative intervention on this land is almost always reactive, in response to a developer and completely tied to the ownership structure. Perhaps we could make better use of land consolidation to better define the territorial project.

Planning isn't proactive enough in terms of non-developable land and is still too residual. Current planning is basically descriptive, circumstantial, does little to set priorities or define projects. And we still need a profound reflection on which territorial assets and values should truly be prioritised, taking into account that our future relies less on the mountains and forests than on productive agricultural land. We must have maps of our assets and review how we use them from an urban planning standpoint."

"L'ordenació territorial i urbanística: cap a una nova llei", Agustí Serra, 2015.

This relaxation of the laws mustn't mean uncontrolled occupation of open spaces nor generalised development, quite the contrary: it is about recognising, firstly, their important economic, social and environmental role and their ability to structure the territory. In this regard, open spaces are neither empty nor can they be defined by their non-developable nature, a definition that demeans their huge importance by highlighting only that they cannot be used for development. As we understand open spaces today, they are zoned, well-defined and well-studied areas (through the Landscape Catalogues, for example) that have their own logic of operations and continuity, and play a key role in the structuring and metabolism of the territory in all arenas and a growing social function. As a result, the legal framework seeks to address the great social demand for content and new uses for these spaces, while also recognising that this interest stems precisely from their nature as spaces where natural elements dominate over constructions and that mustn't change.

Awaiting the passing of the new laws, the new INCASÒL planning understands landscape as the element that structures the territory and allows for continuity of agricultural spaces, boosting their social, productive, and ecological value and facilitating access to nature to

guarantee good health for all citizens. One of the keys to open spaces working properly is that their management respond to a viable productive activity, as it always has. This is key to their sustainability and resilience and means the administration saves on direct management costs. So, when we incorporate new functions in a territory, the internal logic of agricultural and productive spaces with ties to the primary sector must be protected. Even in new developments for economic activity, maintaining the agricultural mosaic is an apriorism that is not up for discussion: fields can't be left-over or fragmented spaces because they must continue working and being viable. In short, the new planning INCASÒL promotes must make economic development compatible with the environment and landscape and must take into account all the aspects that allow for human activity: power generation, the water cycle, mobility and proximity agricultural production; and give the landscape, with its functional logic, a role in structuring the territory.

REASON 30 – WE PROMOTE URBAN PLANNING THAT PROTECTS AND RECOGNISES THE VALUE OF LANDSCAPES

Organising the landscape means designing and organising a series of systems in space, anticipating their management, interactions, and future evolution dynamics. Landscapes don't only have to be beautiful, organised and efficient; they are complex systems that must work properly in their environmental and

socioeconomic surroundings and be sustainable, viable and meet their social function. Climate, vegetation, agriculture, fauna, economic activities, pollution, waste and resource management, land use, urban and territorial occupation models, mobility and infrastructures, use of new technology and data management (like from geographic information systems and climate and ecosystem modelling), generating clean energy, etc. All of these aspects must combine to address the issues related to social use of open spaces.

Climate change is a huge challenge that requires rethinking the role of open spaces, especially in a highly developed country like ours. Acting on the landscape is key for minimising its effects. The concept of landscape incorporates the complexity and depth of the changes that will affect territories in the coming decades and, therefore, can establish strategies to minimise its negative social and economic effects. Through a landscape project, territories can be designed and transformed to make them safer, more resilient and able to withstand the changes that are undoubtedly coming: new water and precipitation patterns that will cause flooding, desertification, erosion or water stress in territories, changes in vegetation and crops, rising temperatures and sea levels, extreme weather, etc. INCASÒL plays a key role in achieving this new balance that must make our territory more resilient, as one of the main landowners in the country. So, its function should not only be to provide land for urban growth and economic activities, but to play a key role in preserving and transforming open spaces with the firm conviction that the landscape (and not only in urban developments) can be a great resource for economic development.

The new tools for landscape intervention, along with a new social awareness and understanding of its value, has allowed for new tasks to recover deteriorated spaces, many near the metropolis or due to the obsolescence of activities that were previously carried out there or the presence of contaminants that endanger their environmental and social role. Environmental restoration of deteriorated spaces is done through engineering, ecology and spatial design. An interdisciplinary approach is essential, both in



Torre Mornau estate in the Aiguamolls de l'Empordà natural park (Castelló d'Empúries)



understanding and often in the intervention strategies: river restoration, for example, is a long process that must combine purifying and improving water quality, restoring biological values and biotopes that had been lost, and making it compatible with citizen recreational activities. As we saw in Point 1, in its projects, INCASÒL incorporates a vision of open spaces that goes beyond the interpretation of a public park (common in the past century) to create spaces that play an environmental role, for example, improving the water cycle, preserving biodiversity, generating clean energy or preserving ecological corridors. Restoring and recovering deteriorated beaches is another of the tasks INCASÒL carries out outside urban areas.

REASON 31 – WE CARRY OUT ENVIRONMENTAL RECOVERY PROJECTS IN DETERIORATED NATURAL SPACES

CATALONIA AND CLIMATE CHANGE

In late 2015, the 21st session of the Conference of the Parties (COP 21) was held in Paris. These periodic meetings, promoted by the United Nations, were regulated by the first big global treaty on climate change, the Kyoto Protocol of 1997. COP 21, unlike previous sessions, reached a historic agreement to fight climate change and promote measures and investments for a resilient, sustainable future with low carbon emissions. The Paris Agreement aims to keep the rise in mean global temperature to well below 2°C and increase our ability to adapt to climate change impacts. Two degrees may not seem like much, but in the situation we are in today, with the global rise in temperature an estimated 1°C, the effects of this warming are noticeable and, in some aspects, dramatic. If we don't take action to stop climate change, it could mean an increase of 4°C or 5°C by the end of the 21st century, with devastating effects for the environment and totally destabilising the economic and social order around the globe. That sort of increase in temperature would mean we have to implement measures that would change our welfare model forever in a dystopic setting: huge climate migration combined with savage protectionism and closing of borders, wars over resources, most species and ecosystems disappearing, new epidemics, etc. In the worst-case scenario, the viability of life on Earth, as we know it, would be seriously affected.

The amount of scientific and popular writing on climate change is extensive and, as long as there are people (especially in positions of authority in the government) who insist on denying the proof of the climate emergency, we will have to continue explaining the dangers we will face if it is ignored. We mustn't forget that former US President Donald Trump was a climate change denier and withdrew the most powerful country in the world (and the second-largest polluter) from the COP 21 Paris Agreement. Under its new president, the United States has returned to the agreement, but this shows that we can't yet say we've won the battle against climate change.





Effects of the storm Gloria
in the city of Barcelona

“Around the year 2030...we will be in a position where we set off an irreversible chain reaction beyond human control, that will most likely lead to the end of our civilisation as we know it. That is unless in that time, permanent and unprecedented changes in all aspects of society have taken place, including a reduction of CO2 emissions by at least 50%.

And please note that these calculations depend on inventions that have not yet been invented at scale, inventions that are supposed to clear the atmosphere of astronomical amounts of carbon dioxide.

Furthermore, these calculations do not include unforeseen tipping points and feedback loops like the extremely powerful methane gas escaping from rapidly thawing Arctic permafrost.

Nor do these scientific calculations include already locked-in warning hidden by toxic air pollution. Nor the aspect of equity – or climate justice – clearly stated throughout the Paris Agreement, which is absolutely necessary to make it work on a global scale.”

Greta Thunberg, transcription of her speech to MPs at the UK Houses of Parliament, 2019.

In Catalonia, our landscapes and the viability of many agricultural and tourist activities that keep them alive are faced with uncertainty in light of the challenges of climate change. Beyond that, extreme weather episodes come on top of the already violent, torrential rains that are native to our Mediterranean climate. Storm Gloria in 2020 was a warning of what is to come in the near future, but the sudden outbreak of the pandemic didn't give us time for the deep reflection an unprecedented weather episode of this magnitude deserves.

The Catalan Office for Climate Change the technical instrument of the Catalan Government, under the Secretariat for the Environment, charged with promoting climate change strategies, plans and projects. Based on European commitments, the Office ensures climate change mitigation and adaptation is part of sector policies and promotes projects and actions in collaboration with other governments on climate policies. Furthermore, the Office acts as the technical and administrative secretariat for the Interdepartmental Committee on Climate Change, which coordinates the actions of all departments of the Catalan government.

One of its functions is to publish the extensive reports drafted by the Group of Experts on Climate Change of Catalonia and promoted by the Advisory Council for the Sustainable Development of Catalonia. The third of these reports on climate change in Catalonia was published in 2016. The tome, with over 600 pages, analyses the state of the climate and its current and future evolution in Catalonia, both from a scientific standpoint and relating to the various natural subsystems and socioeconomic sectors. It is an independent report from a scientific standpoint, with over 140 authors and 40 reviewers, all important technical experts in the subject, from the top research centres and universities in our country.

Their conclusions leave no room for doubt: of the 17 hottest years on record, 16 have been after the year 2000, and for the first time in history, the average global temperature in 2015 was 1°C above the pre-industrial era. In Catalonia, the average yearly air temperature has risen 0.23°C per decade, which is slightly higher than the global average. The effects of this warming are numerous and will clearly condition our collective future.

Climate change leads to more impoverished ecosystems and a loss of biodiversity due to the proliferation of invasive species, thermal displacement of species due to increasing temperatures or the tropicalisation of the sea; it causes changes to the flowering and growth patterns of plant species, alters the annual cycle of many plants and animals, and affects the quality and quantity of crops.

Climate change doesn't only affect the temperature: projections point to a slight decrease in precipitation, which will become more marked around the middle of the century, with increased probability of more intense rain and the number and length of droughts, which will become more intense. Droughts often lead to forest fires. Snow will become more and more scarce, putting the economic model of mountainous counties at risk, etc.

The Catalan Office for Climate Change notes 11 effects that are already quantifiable today and show the impact of climate change on our territory. The future evolution of these and other effects will depend on our ability to establish strategies to mitigate and adapt to them, but above all to meet our commitments to reduce emissions on a global scale.

ELEVEN DISPLAYS OF CLIMATE CHANGE IN CATALONIA

1. Phenological changes to the annual cycle of many plants and animals



The leaves of many trees, flowers of many plants and many related insects are appearing between 10 and 20 days earlier than 30 years ago. That affects different species' ability to compete, their conservation and, therefore, the structure and function of the ecosystems. These responses lead to significant desynchronisations in inter-species interactions, for example among plants and pollinators, plants and herbivores, or birds and their food sources.

These changes are also significant in agriculture (pollinators, pests, etc.) and can affect people's health, due to out-of-season allergies.

2. Winegrowing is dependent on the climate



Rising temperatures lead to shorter ripening periods, and this has a series of negative effects on wine quality: higher sugar content in the fruit, due to faster ripening, leads to higher alcohol levels and less acidity. Higher pH yields red wines that are lighter in colour and makes them more susceptible to developing microorganisms, lasting less in the bottle. Also, rising temperatures increase the risk of water stress, which is extremely detrimental during the ripening phase, as it can throw the ripening of the skin out of synch with the ripening of the pulp, which leads to harsher wines. Many wine producers are moving their vines to higher altitudes to compensate for the increasing temperatures. Historic winemaking counties could be unable to grow this crop in the future. Plus, grapes are harvested earlier and earlier every year.

3. Impact on tree growth



Progressive drought in recent years has led to increasing defoliation and, in many cases, causes trees to grow less. This impact is hard to analyse separately per year, but there are indications that leave no room for doubt: the beech trees in the Montseny, for example, are growing less, up to 50% less than 50 years ago.

4. Increasing frequency of drought



Over the past 20 years, there have been five significant periods of drought in Catalonia, putting pressure on the urban water supply and forcing the government to take exceptional measures. These episodes were in 1984, 1998, 2001, 2005 and 2007. We would have to go back to 1953 to find a similar episode. This phenomenon is happening all over the world, in important cereal-growing areas like Russia (2010-2011), China (2010-2011) and the US (2012). All these cases were extremely intense, totally out of the ordinary and affected large swaths of the planet. The scientific community believes

climate change was the main cause. As a result of dwindling crops due to these droughts, prices rose on many agricultural or processed products, both for human and animal consumption.

5. Drop in snow cover



According to data from Météo-France (SAFRAN/CROCUS models), between 1960 and 2010, the Central Pyrenees (north face) saw snow cover drop 5 centimetres per year at an altitude of 1,800 metres above sea level. Here at home, many mountain valleys and counties have tied a good part of their economy to winter sports. For the sustainability of these territories, the possible obsolescence of their economic model would be a huge challenge in territorial management.

6. Thermal displacement of animal species



The average temperature has moved 250 kilometres north. European birds and butterflies have also been moving north, following in the footsteps of climate change. Nevertheless, they haven't made it to the areas that suit them best in terms of temperature. So, certain bird and butterfly populations have only moved between 38 and 115 kilometres, respectively. On the other hand, Catalonia is seeing butterfly species considered endemic to Africa, like the Plain Tiger butterfly. This displacement has also been seen in vegetable species migrating in latitude. So, in the Pyrenees, forest species have been moving up three metres a year for the past 30 years. The ones already in high-mountain areas run the risk of disappearing, as they can't move to a higher altitude.

7. Shrinking glaciers



In the Spanish Pyrenees, glaciers covered a total of 1,779 hectares in 1894. In 1982, they had shrunk to 595 hectares; in 1993, they occupied 468 hectares and in 2002, just 277 hectares. The latest assessment of Spain's glaciers was in 2008 and estimated the figure at 211 hectares, anticipating their disappearance. This shrinking of the glaciers in the Spanish Pyrenees is comparable to what is happening in the French Pyrenees, the Alps, the Himalayas and with glaciers all over the world. They are a powerful indicator, given that a glacier doesn't shrink because of one bad year. It takes continued temperature change and lack of snowpack for this to happen..

8. Meridionalisation and tropicalisation of the Mediterranean



Two main biotic events are taking place in the Mediterranean Sea. The first is meridionalisation, meaning that warm-water species normally found in

the southern, warmer part of the basin (more southerly species) are moving north. These southerly species benefit from the new conditions in the northern part of the basin. The other reaction to global warming is tropicalisation, meaning the invasion of tropical species that aren't native to the basin. This also affects commercial fish species, above all the population in critical condition due to overfishing. Several warm-water species have invaded colder ecosystems, and the cold-water fish that used to be fairly abundant in warmer ecosystems have become scarce or disappeared completely. For example, sprat and horse mackerel have become very scarce or disappeared completely from the Mediterranean. Lately, fish that were never part of our marine ecosystems have been caught, like the puffer fish.

9. Increase in temperature



Catalonia, like the rest of the world, has seen its average annual temperatures rise. Here at home, it has risen 0.24°C per decade between 1950 and 2013, and more sharply in the summer (up to 0.35°C per decade). Between 1950 and 2012, six of the eight hottest years in Catalonia were in the 21st century (2003, 2006, 2009, 2011, 2012 and 2015).

10. Changes in precipitation



The changes in precipitation are hard to establish or clearly verify, especially in our Mediterranean region, as average rainfall varies widely by season and year, as well as being irregularly distributed in the territory. However, between 1950 and 2011, the precipitation in summer has dropped 5.4% per decade. There is also a notable concentration of precipitation in fewer days (increased torrential rains).

11. Heatwaves



In Catalonia, three consecutive days of heat increase daily death rates by 19%, and by 35% when the heatwave lasts seven consecutive days. Regarding total deaths during the hot season, 40% are attributable to the extreme heat not classified as a heatwave. In the city of Barcelona, the death rate rises considerably when the temperature is over 30.5°C. The risk of death associated with a 1°C increase above this level is 6%, 7% and 5% after one, two and three days of spiking temperatures.



It is clear that one of the United Nations' main motivations in creating the programme known as the 2030 Agenda was to work together, globally, to combat climate change. We could say that this challenge underlies all the Sustainable Development Goals because the scenarios that we will experience in the coming decades will be substantially different depending on the evolution of global temperature, and they are very difficult to anticipate.

Sustainable Development Goal 13 directly addresses climate action and recognises that climate change is the most significant environmental challenge humanity must face in the 21st century, and therefore all countries must get involved. SDG 13 calls on us to take measures to combat climate change, focusing on reducing greenhouse gas emissions. This means integrating climate change actions into all public policies (on everything from economy to health), implementing measures to help adapt to climate change, developing prevention plans and acting in the face of extreme phenomena, and educating citizens in acting accordingly and learning to protect themselves in critical situations like heatwaves and torrential rains.

The Urban Agenda obliges us to tackle these challenges in the local and regional arena, which is why the Catalan Strategy for Adapting to Climate Change establishes measures to make Catalonia less vulnerable to its effects. The strategy lays out two operational goals, to generate and transfer knowledge and to increase our ability to adapt, and six transversal goals. These are based on a series of adaptation measures for each socioeconomic sector and/or natural system studied. The Strategy highlights that 80% of the actions required to combat climate change are at the sub-state and local levels. In Catalonia, the Covenant of Mayors for Energy and Climate is the ideal framework for carrying out local mitigation and adaptation actions. Local efforts to adapt to climate change must include a series of structural

changes (more vegetation, more efficient use of water) and anticipate exceptional situations like heatwaves, storms, river flooding, drought, or other possible disasters. The Urban Agenda for Catalonia must delve deeper into the covenant and help advance in laying out concrete measures.

"The impacts of climate change, the pollution affecting urban environments and territories far from cities, the dependence on a primary energy model based mainly on fossil fuels and the establishment of a linear consumption system sustained by the continuous plundering of natural resources and indiscriminate waste production, all make it urgent to change the paradigm in formulating urban policies to not only stop but also reverse a trend that hurls us toward worse living conditions for future generations."

Declaration for an Urban Agenda for Catalonia, 2017

CONSUMPTION, RESOURCES AND ENERGY TRANSITION

“There is no question that the Paris Agreement, signed in 2015, launched the greatest challenge ever posed to the nations that make up the United Nations Framework Convention on Climate Change, a challenge that requires a fundamental transformation of our energy and economic systems on a global level. This transformation will only be possible if it is tied to a shift in the social system of the same magnitude. It is difficult to find an analogous situation in the history of modern society.”

Third Report on Climate Change in Catalonia, 2016.

The transformation of economic systems shifts in social systems and, above all, the energy transition and rethinking our consumption model are key to winning the battle against climate change. Catalonia is a small country, rich in landscapes and biodiversity but poor in natural resources. The highly concentrated demographics (residents and visitors), urban development pressure and great economic activity (particularly logistics) generate a series of tensions that limit our territory's ability to sustain our society's model. So, we must organise and rationalise land use to preserve the rich natural treasures, while also providing spaces that improve environmental behaviour, food and energy production and encourage a more responsible consumption model. The viability of our territory, its ability to face the challenges of the future, depends on

striking this delicate balance between nature and human development.

The environmental consequences associated with fighting climate change are one of the ideas that find the most consensus around the world, but the different speeds of human development make it difficult to coordinate action globally. This is why more advanced societies must be pioneers in trialling realistic, lasting development models that can be applied to all human societies. It is a very deep cultural shift that will resurrect humanity in the physical world: from a position of absolute dominance over nature, in a context of climate change and overpopulation, we must recognise that only by putting humans in their proper place within the natural world (which is both our habitat and vital source of life) can we build a future with renewed prospects of progress. To do so, we must separate economic growth from the consumption of resources, as we cannot expect infinite growth on a planet with finite resources. This new paradigm is hugely capable of transforming humanity as a civilisation entering squarely into the Anthropocene epoch, a new reality in which environmental processes will only evolve positively and in a way compatible with human life if we take direct control over them. If we don't act to change our economic and consumption model, evidence shows it will be infeasible in the not-too-distant future, and we will have done irreversible damage to our ecosystems.



Vila Sana (Pla d'Urgell). Photo: Jordi Bas
Arxiu d'imatges de l'Observatori del Paisatge de Catalunya



To rationalise land use and improve the environment, we must reflect on our consumption model. Ecological footprint is a concept that expresses the amount of land required to sustain our lifestyle, in short, the amount of land we need to produce the resources to feed and house ourselves, enjoy all sorts of consumer goods and services, move around, and manage the waste we produce. It sums up, therefore, the impact of human activity on the environment. In 2012, the latest year data is available for, we would have needed 1.64 planets for our consumption of resources and waste management to be sustainable. Some of the United Nations' projections show that, by roughly 2040, we would need two planets to ensure our model of civilisation. In Catalonia, a first calculation from 1996, 24 years ago, showed the country's footprint was 6.5 times larger than its surface area. In a later calculation, from 2001, the footprint had grown from 6.5 to 7.7 (in just five years): we would need a surface area the size of the United Kingdom to sustain our lifestyle and consumption model. It is important to note that there is no scientifically proven, globally accepted method for doing these calculations, and no new ones have been done since, but the concept of ecological footprint, no matter how inexact, acts as a warning of the need to rethink all the growth and consumption parameters of our society.

Water is one of the factors that most limits human growth; the most important of our limited natural resources. So, one of the 17 Sustainable Development Goals focuses exclusively on water. Water isn't just a resource for humanity; it is also essential to the natural environment. Water is abundant on Earth; however, just 3% of the planet's water is fresh and less than 1% of that can be used for human consumption. The rest is frozen or underground, out of reach. Catalonia is a country where water is scarce: the rainfall in Catalonia, as a result of our Mediterranean climate, is generally irregular and varies widely from year to year. Over the past 20 years (1988-2007), the inland basins have seen up to six drought warnings that have required exceptional measures to ensure water supply. In systems like the Ter-Llobregat, demand is already very close to supply. The total demand for water in Catalonia, for all uses, is 3,100 hm³/year, which is equivalent to a steady flow that could fill an Olympic swimming pool once a second, or 10,000 football stadiums each year. Although

water management does not fall under the purview of INCASÒL, improving the water cycle plays a big role in new developments, including many spatial and design strategies, as we saw in Point 1, and taking into account new environmental parameters applied to spaces for economic activities (as we saw in Point 4).

Energy use is closely tied to the emissions responsible for climate change and therefore, any attempt to control climate change includes reducing emissions. Fossil fuels are directly responsible, as CO₂ is a by-product of burning them, whether for transport, industrial production or directly to generate primary energy at power plants. If we consider the fuel used for transport, 69 out of each 100 kWh of power used in Catalonia is still from fossil fuels. In producing primary energy (electricity), our dependence on fossil fuels isn't as great, but nearly 50% of production comes from nuclear plants and only 20% from renewable sources, including hydroelectric plants and wind energy. Achieving the goal of progressively incorporating renewable sources until they make up 100% of power requires land to be re-zoned for new power-generation models, for solar or wind parks.

"Catalonia has committed to reducing GHG emissions 40% by 2030 compared to 2005 levels (COCC, 2015). This will be part of the Spanish contribution to cutting emissions 25% over the same period and cutting emissions in the European Union by 34% (40% reduction from 1990 levels). This puts Catalonia's efforts well above the Spanish and EU average, on par with the efforts made by the most economically advanced countries in Europe and the United States.

It isn't easy to assess whether Catalonia's commitment or that of any other nation is in line with the goals of the Paris Agreement to stabilise global temperature at under a 2°C increase and try to keep it under 1.5°C. There are two reasons for this. Firstly, the fact that the only balance we can compare contributions to is the global carbon balance remaining to keep global warming under 2°C. This balance is allocated through political decisions made by each of the member states of the Framework Convention on Climate Change."

Third Report on Climate Change in Catalonia, 2016.

Catalonia is far behind other regions of Spain and our neighbouring countries in terms of wind energy. While wind energy makes up 23% of the total in Castile and León, in Catalonia it isn't even 5%. In some areas, like Girona, there are hardly any wind turbines, and they continue to be rejected by general society, mainly with the argument of their impact on the landscape. The energy transition will have a critical impact on our society, and it is a fundamental pillar of the green, circular economy. If we continue applying a reductionist view of what landscape is and don't accept that every generation has changed it to meet their needs; if we continue labouring under the false assumption that power is generated in remote, invisible locations, it will be impossible for Catalonia to adapt to the energy transition and meet the goals for reducing emissions that we have committed to. This is why INCASÒL is committed to fostering renewable energy and the energy transition, through urban planning (encouraging spaces to produce energy with landscape integration criteria), directly through implementing innovative systems in newly developed sectors or through management of the forest areas under its purview (for example, through biomass).

REASON 32 – WE INCORPORATE PROJECTS AND SET ASIDE SPACES TO GENERATE CLEAN ENERGY

Food production, waste management and transport have a huge influence on our impact on the environment. So, producing and consuming food based on proximity is another pillar of the energy transition. Food sovereignty is a concept that aims to rationalise our relationship with food: the current system encourages agricultural products being freighted all over the globe to an extent that at times borders on the absurd. In 2018, 4.8 tonnes of food were consumed in Catalonia. Today, with nearly 30% of the country's surface area used for crops, Catalonia only produces 45% of the non-processed agricultural products we consume. One of the keys to food sovereignty is to stop the receding of agricultural operations in our country and the abandonment of rural counties.

Consuming meat and fish has a huge environmental toll: animal farming is responsible for 14% of global greenhouse gas emissions. In Catalonia, there are 7.8 million heads of cattle and 43 million poultry birds. Managing the liquid manure, which contaminates the soil, of the 6.5 million pigs in Catalonia is a huge environmental challenge. Animal farming also generates polluting gasses and uses a lot of water. It takes 8,700 litres of water to produce one kilo of beef. In the Mediterranean, 87% of species suitable for human consumption are overexploited.

In the European Union, 88 million tonnes of food go to waste each year. This is enough to feed 137.5 million people, based on standard Catalan consumption. At home, each Catalan generates 1.43 kilos of waste per day and a lot of this is related to food and its packaging, contributing to the dramatic spread of plastics in the environment, which has garnered much media attention lately.

Rationalising our consumption habits is key to achieving a sustainable development model for future generations. But to mitigate the effects of climate change, we have to create a natural network that can offset the negative impact of human activity, that is well connected to ensure the ecosystems are healthy and well managed in order to make it less vulnerable. Agricultural production offers an opportunity to combine all of these goals. Historically, we've thought of the area outside of cities as empty space, but now we understand these intermediate spaces between nature and urban areas are the ones that can knit the territory back together and bring nature closer to the people. They are spaces that can change how our country works, making nature compatible with human activity. They can be spaces for producing food and clean energy, a place where infrastructures are integrated respectfully into the landscape and don't stymie citizen use. Intermediate spaces can create a system of interconnected spaces that contribute wellness, health and biodiversity, and help us mitigate the effects of climate change. Through these spaces, Catalonia can be structured as a territory of cities connected through the landscape and restore balance and daily contact with nature.

Food sovereignty promotes a closer relationship between food production and citizens, helps organise and manage periurban landscapes and promotes their use for social purposes. Environmental education is another advantage of bringing agriculture closer to the city. Observing the natural rhythms of agricultural production can help promote more responsible consumption and guard against frivolous consumption of produce out of season, which has probably had to cross the planet to reach our tables. To foster food sovereignty and ecological, responsible agricultural production, INCASÒL, in new growth, prioritises keeping and revitalising the agricultural mosaic. It also incorporates spaces for producing food in new developments or open spaces it manages directly.





View of the Llobregat river with the town of Sant Boi in the background (courtesy of Batlleiroig)

REASON 33 – WE BRIDGE THE GAP AND ENCOURAGE PRODUCTION OF ORGANIC AGRICULTURE IN URBAN SPACES

Catalonia, like the planet as a whole, is in ecological debt. Each year, humankind consumes 50% more resources than the Earth can replenish without affecting its ecological balance. Or in other words: each year what we consume would take a planet and a half to produce. To a certain extent, we are using resources that belong to future generations and we must be aware of the values and limitations of our small country, which is extraordinarily rich and diverse but also extremely fragile. In Catalonia, 2020 kicked off with one of the most extreme weather episodes in memory. Storm Gloria was a powerful warning of the effects climate change can have on us here at home. The crisis unleashed by the coronavirus has made us understand how fragile and defenceless human beings are in an environment that can turn against us. Faced with this situation, our safety requires us to adapt our lifestyle and our territory to the consequences of the climate emergency. The pandemic and its global effects have been a reminder of what is clear: our planet is one immense, interconnected ecosystem and we are pushing it to its limits.



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