

How Landscape Ecology Can Promote the Development of Sustainable Landscapes in Europe

The role of the European Association for Landscape Ecology (IALE Europe) in the 21st century

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How landscape ecology can promote the development of sustainable landscapes in Europe: the role of the European Association for Landscape Ecology (IALE-Europe) in the twenty-first century

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Abstract In Europe, landscape research has a long tradition of drawing on several disciplines. ‘National schools’ of landscape research developed, which were related to the characteristic landscapes found in the different countries and to specific linguistic meanings and legal traditions when using landscape related concepts. International co-operation demands a certain harmonization of these concepts for better mutual understanding. The 2000 European Landscape Convention provided an important momentum to rethink research, policy and management of landscapes from the perspective of sustainable development and participatory planning. Landscape ecology as a transdisciplinary science with a dynamic and holistic perspective on landscape offers a great potential for an integrative approach. The specificity of the

European landscape research rests on its long history and on integration based on the great diversity of the landscapes, characterised by an intimate relationship between the varied natural environment and the different cultural traditions which define the identity of countries, regions and people. Within a unified Europe, with increasing international and trans-border co-operation and increasing common environmental problems, the creation of a specific European Association for Landscape Ecology (IALE-Europe), in addition to the existing international association and its national chapters, became justified by the need for a collaborative endeavour to address the specific problems of landscapes in Europe and to stimulate co-operation between landscape ecologists in research, education and practice.

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Why IALE-Europe?

This article reflects upon the tradition of landscape research in Europe, and the reasons underlying the specific attributes of this research, justifying the organization of European landscape ecologists in an united European chapter within IALE—the International Association for Landscape Ecology. The coordinated endeavour to sustain the specificity of European landscapes, their history, use, heritage value, conservation, emerging research and policy issues, and to master their constant on going changes justified the founding of the association in addition to the existing International Association (IALE) and its national chapters. IALE-Europe was also influenced by the varied development of the scientific discipline of landscape ecology, by the concept of landscape and its multiple interpretations in a multi-lingual Europe and the growing need to mobilise and integrate these different traditions in the common efforts to meet the changing demands for research, planning, management and policy in a rapidly transforming world. Further, strengthening the European dimension is also aimed at facilitating research on broad scale landscape systems in Europe, that cross country boundaries and are particular for Europe, and on gradients that are particularly expressed in European landscapes. Finally, IALE-Europe provides a way for landscape ecologists who do not have a country chapter to collaborate on important landscape issues with colleagues in other parts of Europe dealing with similar issues.

Landscape ecology: its European roots

Before the second world war, the German geographer Carl Troll developed a holistic and integrated methodological approach for studying landscapes using the then emerging technique of aerial photography which provided a new way of observing the face of the earth (Troll 1939, 1950). He introduced the term *Landschaftsökologie* and called it an '*Anschaungsweise*', 'a way of looking' at the landscape from a combined ecological and geographical perspective resulting in a holistic and interdisciplinary synthesis.

After the second world war, this integrative approach was suppressed by the continuing specialisation that was taking place in all the sciences. But it gradually became clear that environmental problems and societal demands on the landscape are too complex to be solved by a single discipline. This was the main topic of discussion during an international and multidisciplinary congress on '*Perspectives in Landscape Ecology—Contributions to research, planning and management of our environment*' held in Veldhoven (the Netherlands) in April 1981 (Tjallingii and de Veer 1982). As a result, the broken link within the tradition of landscape ecology as defined by Troll was re-established leading to the formal creation of the discipline of landscape ecology which integrated many different disciplines dealing with landscape research. In October 1982, the International Association of Landscape Ecology (IALE) was founded in Piešťany (Slovakia), and was based on an emerging cooperation between Western and Eastern Europe. The resulting ideas about landscape ecology were rapidly reconceived in a North American context by different specialists dealing with the landscape.

All over the world, humans have constantly been changing the natural environment and created cultural landscapes. These were accustomed by the geographical settings and the mode of subsistence, depending on available technology and social organisation. The extremely varied geographical setting in the European continent, and especially the many comprehensive marine inlets, has been highlighted as important conditions for an upcoming capitalist mode of production and a globalizing trade. In the new parts of the world that were taken into possession by European nations, the development of cultural landscapes was mainly inspired by the European traditions, neglecting local pre-colonial cultural landscape development, often considered as more or less pristine and of minor relevance for the new ruling class. In Europe, however, most cultural landscapes have a long historical tradition and are considered an expression of culture and power, containing many symbolic meanings both in the natural and cultural heritage they represent. Nevertheless, many of these landscapes have rapidly been transformed and simplified in the last decades by land use intensification and increasing urbanisation. The traditional landscapes that still remain are rapidly losing their ecological and heritage values, considered as 'natural and cultural capitals'

which are important for local and regional identities. At the same time, new landscapes are being created, resulting from new combinations of drivers, again in high levels of complexity due to the interplay of multiple transition processes occurring in each place. Due to these different trends, landscape analysis has progressively been ‘discovered’ by multiple disciplines, such as archaeology, landscape architecture, planning, economy, and a whole range of human sciences, which previously had no tradition in landscape research.

Today many disciplines are involved in landscape research. Landscape ecology has evolved as a widely recognised distinctive approach among these cooperating disciplines. However, there are many transitions between the different approaches in landscape research and its application, which for most is the domain of planning, management and policy. Therefore landscape ecology should be flexible and recognise its strengths and weaknesses in the scope of this broader landscape research. The European Landscape Convention (ELC), adopted by the European Council in Council of Europe (2000), has decisively brought landscape issues into the arena in which different disciplines intermingle. This is because it clearly positions the landscape in the interaction between natural and cultural factors, both in its material and mental representations. More than 10 years after its signature, the ELC is broadly accepted as the shared European understanding of the landscape. The ELC shows the need for a more ecological approach, but also for assessing the social and cultural aspects of the landscape, which demands research methods from natural as well as from social sciences and humanities.

Landscape research in Europe: a long tradition

When Troll introduced the concept of landscape ecology, he formulated a new approach, which was based on a holistic view using aerial photo-interpretation, in the already long tradition of ‘landscape science’. Although descriptions and representations of landscapes in Europe date back to the fourteenth century, scientific research concerning landscapes began with the development of natural sciences during the nineteenth century. It was strongly influenced by naturalists’ explorations such as those by von Humboldt and Darwin, as well as by Kant’s philosophy.

Landscape research became a core topic in the emerging geographical science. The term *Landschaftskunde* was introduced by the German geographer Oppel in 1884 and an important German school of landscape research developed focussing on theoretical concepts for the description and analysis of the relations between the ‘natural’ and ‘cultural’ landscape. The large variety of landscapes and of languages and cultures meant that very different ‘national’ schools of landscape research emerged.

The first international network of academics studying the European landscapes was the Permanent European Conference for the Study of the Rural Landscape (PECSRL) founded in 1957. The focus is on issues in historical geography, although also other disciplines such as landscape architecture are active. The main purpose is to exchange knowledge by facilitating personal contacts. More recently, it functions as a forum for new initiatives in European landscape research and landscape management and stimulates cooperation between researchers, managers and policy makers. PECSRL organises a bi-annual conference. Later, in 1967, the Landscape Research Group (LRG) was founded as a charity aiming to promote landscape research in the broadest perspective for public benefit. Landscape research developed rather independently in eastern and western Europe due to the cold war. In Eastern Europe, the Centre of Biological-Ecological Sciences, Slovak Academy of Sciences in Bratislava in former Czechoslovakia organized international symposia on landscape ecological research every third year since 1967.

Over the last 20 years, several European networks have been set up dealing with landscape research from different perspectives, such as research and expertise, and specific themes such as rural and agricultural landscapes, history and archaeology, design, architecture and planning. Each of these groups organizes its own conferences and workshops.

Landscape: subtleties of languages

The word ‘landscape’ emerged in the Germanic languages during the thirteenth century and refers etymologically to an organised area of land, managed in a specific way giving it a proper character and related to which certain rules applied. Since the renaissance, pictorial representations of the landscape

scenery were also called ‘landscapes’. In everyday language, the word landscape has multiple meanings, which also vary among languages. Consequently, ‘landscape’ has an existential meaning, deeply rooted in culture and history and reflecting the role of the land in the identity of local communities. Thus it also refers to a social territory, a fact which is sometimes reflected in ancient administrative divisions and referred to by proper names.

It is remarkable that in the long history of landscape research in Europe, no generally and internationally accepted definition of landscape as an object of scientific study or planning emerged. An important reason for this is the subtle differences in meaning of landscape-related concepts in the many languages used in Europe, impeding international co-operation. For example, the German ‘*Landschaft*’ relates to territory. The English ‘landscape’ mainly refers to the scenery, while the territorial and social aspects are reflected in the word ‘countryside’. The French ‘*paysage*’, which has its equivalent in all other Latin languages, clearly refers to the characteristic appearance of a ‘*pays*’, a region of land with deep historical roots. It emphasises rural space, which is also referred to as ‘*campagne*’ and is similar in meaning to ‘countryside’. In the old Nordic tradition ‘landscape laws’ were landscape specific frames for regional land use regulation. The Greek ‘*topos*’ refers to ‘place’, whence the Greek word for landscape (‘*topio*’). Subtle differences exist in Slavic languages where the concept landscape has its roots in ‘*krajina*’ which is closely linked to ‘soil’ and ‘land’.

The diversity of landscapes is also expressed by many adjectives used to clarify the type of landscape one is speaking about. In the European tradition, a sharp distinction has been made between ‘natural’ and ‘cultural’ landscapes, as well as between ‘rural’ and ‘urban’ landscapes, and a variety of associated concepts, such as ‘countryside’, ‘campagne’, ‘region’ and ‘territory’ add to the complexity.

The landscape only became a common concern in policy and applied research with the coming of formal definitions based on international conventions. These had an impact on national legislations and also stimulated international co-operation. The first formal definition was given by UNESCO in 1992 when it introduced the notion of ‘cultural landscapes’ as a new category in the UNESCO World Heritage List.

The impact of the ELC of 2000 was important not only for its formal definition of landscape, but also for

its related definitions and scopes, setting new guidelines for policy and research.

European landscapes: a mirror of Europe’s identity and diversity

The diversity of the European landscapes and their cultural settings resulted from a long interaction between very diverse natural and cultural factors and the particular shape of the continent. Europe has a highly contorted and dissected coastline, creating many large peninsulas and sea straits. Throughout history, the continental seas were seldom barriers to the development of civilizations and nations, quite the opposite. The interior of the continent shows, particularly in the western and central parts, many spatial compartments formed by mountain ridges and tectonic basins or river valleys. Each of these formed a niche for the settling of different ethnic groups as is still shown by the distribution of languages in Europe. These geographic compartments formed cradles for the establishment of most nation-states in Europe. To the east of Europe the land becomes flatter and there are vast plains. The political borders between states were more stable during history in the part of Europe where the natural setting was more compartmented. Thus, European landscapes became an essential characteristic of cultural and regional identities and of the whole continent as well. This was recognised in the first environmental assessment carried out by the European Environmental Agency (the ‘Dobříš Assessment’ European Environmental Agency 1995), which placed the landscape on the political agenda.

Landscape: broadening the focus with the European Landscape Convention

The definition of landscape in the ELC is particularly important for many reasons: “Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” (Art. 1). First, it is the only common reference available among the many different linguistic meanings in Europe. It combines different notions and meanings: territory (“area”), scenery and existential meaning (“as perceived by people”), regional identity and holism (“character”), history and ecological dynamics (“result

of the action and interaction”) in a transdisciplinary and integrated way (“natural and/or human factors”). Also, the scope is very broad as Art. 2 states: “this Convention applies to the entire territory of the parties and covers natural, rural, urban and peri-urban areas. It includes land, inland water and marine areas. It concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes.” Thus, not only should selected landscapes of ‘outstanding’ value be taken care of, all landscapes should be considered equally. In fact, the definition of landscape in the Landscape Convention is very similar to the original etymological concept, where landscape is seen as a unique synthesis between the natural and cultural characteristics of a region. This evokes a special response in the tradition of landscape ecology, typically it has broadened the often more narrow perspectives of conservation biology, restoration ecology or countryside planning, with social, psychological, aesthetical and economical components of the landscape. The ELC also formally defines landscape policy and planning, as well as landscape protection and management, invoking “forward-looking action to enhance, restore or create landscapes” against the background of sustainable development and participation of the population.

Changing Europe: changing landscapes and policy at the European level

Increasingly wider and faster changes of the landscapes in Europe present new challenges in spatial and environmental planning and demand new policies. New landscapes largely wipe out traditional ones, often causing a significant loss of landscape diversity and an increasing homogenisation. Parts of Europe are in the process of rapid urbanisation and industrialisation, while others face extensive land abandonment. Some changes ignore national boundaries, such as climate change. The description and analysis of the processes involved has resulted in a confusing variety of new concepts from many different disciplines that are not yet coordinated.

Although landscape issues have been recognised by the European Environmental Agency (EEA), the European Union has no direct authority concerning landscape matters. Nevertheless, many of its policies and legally binding directives have a great impact upon the landscape. The clearest example is the

Common Agricultural Policy (CAP), but many other directives can be mentioned as well. Other examples with indirect impact on landscapes are the directives concerning biodiversity and habitats (1992), water resources (2000), soils (2002), and the comprehensive strategy for sustaining human well-being and the environment (2001). However, in all EU-countries these directives are implemented in sectorial legislation in domains that have no competence in landscape policy. Also, the mainly economically driven EU policy is not consistent with broader goals of the Council of Europe and the emphasis the Council made in the ELC. This concerned the important role of landscapes in the regional identities of Europe, and landscapes’ role in people’s well-being and people’s democratic rights in participation. This discontinuity (between the EU and Council of Europe) can only be addressed using landscape approaches that relate the importance of sustainable and functioning landscapes to the economy of local, region, and European-wide scales.

The rapid landscape changes and complex policies affecting these have resulted in new demands for landscape research. Typically these are demands for the formulation of policy relevant indicators of land use change, landscape characterisation, scenarios of change, procedures for public assessment and participation. Most of these demands have resulted in new fundamental and applied research and the development of new methods. Monitoring landscape changes has demanded the development of transparent indicators, often using and combining different landscape metrics. Landscape characterisation has led to mapping the diversity and identity of landscapes, resulting in new landscape atlases and biographies. Increasing the consideration and participation of the public in decisions has demanded new analyses of the visual landscape and assessment of landscape perception, demanding the development of new methods, which can be used to assess the subjective relations people establish with the landscape. The potential and effects of multifunctional land use in landscapes became more prominent as a result of an increased societal demand on multiple functions and services provided by the landscape. In general, a transdisciplinary approach to landscapes was stimulated involving locals, experts, researchers, planners, practitioners, managers and policy makers to deal with conflicting sector demands in the same landscape.

The divided competences and focus between the European Union and the Council of Europe have also had a growing impact on the meaning and interest in the landscape and hence on the need for research related to it, and thus also possibilities for funding research. The European Union is still essentially an economic union—nowadays also confronted by a deep financial crisis—having important competences and financial means in the domains of land use (agriculture), infrastructure and environment. Reorienting EU's focus because of these economic changes will affect the landscapes as well. Essentially, the Council of Europe has moral authority on issues related to human rights and the coherence and co-operation of its member states. It considers the landscape as a common good and human right. Hence, its value for people's well-being is essential and implies landscape's significance as natural and cultural heritage and its qualities for sensual experiencing. These meanings stimulated an increasing interest for the landscape from human and social sciences.

IALE-Europe: a framework to develop knowledge about landscape ecology beneficial for the future of the European landscapes

The primary focus of IALE-Europe is on the coordinated endeavour to master the challenges related to the specific conditions of European landscapes and their demands for research, communication and landscape practice, however it relates to the global context. On one side, it aims at facilitating the identification and the study of those landscape trends that are clearly occurring across boundaries in Europe, and for this to focus on the continental scale. But also, on another side, IALE-Europe is based on the recognition that all knowledge, scientific or other, is contextualized, i.e. produced within a particular area and culture and a set of spatial and social arrangements, even if in a globalizing world. Thus more specific contextualization of the research, enhanced by interdisciplinary cooperation between researchers and practitioners, and even by transdisciplinarity, in the tradition of IALE, can promote more socially robust research. By this we mean research that is seen by society as a true problem solving research, which addresses questions emerging from practice, formulates the relevant problems and gives a sound contribution for their solution. And which also is flexible enough to adapt to

continually new emerging questions and to the construction of novel conceptual and methodological approaches that can support in finding these solutions, also facing the increasing uncertainty concerning future changes in Europe's landscapes. The increased contribution of European landscape ecologist to the debate and assessment of ecosystems services at the landscape level is just one example of this flexibility and adaptation. To this end, IALE-Europe encourages research in combined quantitative landscape analyses, qualitative assessments and practical approaches to land management and land use, so as to formulate sets of good practices per landscape type of Europe.

IALE-Europe offers a platform for organizing knowledge transfers, collaboration amongst scientists of the different disciplines, and the development and organization of common and novel methodologies, data exchange, targeted working groups, etc. IALE-Europe aims to emphasize vocational and professional training in sound landscape management, thus serving as a major actor in turning the hitherto (landscape-insensitive) "land management" to future (landscape-sensitive) "landscape management". This aim goes in tandem with the European Union's repeatedly stated aims to foster vocational training across Europe. Further, IALE-Europe is particularly aware of the need to foster new generations of integrative landscape ecologists, promoting discussions with younger researchers, offering intensive PhD courses and specific support for young researchers.

Further, IALE-Europe is working to establish close links with already created and well-functioning networks with related thematic orientation, e.g. ECLAS (Council of Europe of Landscape Architecture Schools), AESOP (Association of European Schools of Planning) and UNISCAPE (European Network of Universities for the Implementation of the European Landscape Convention), among others.

In relation to the ELC, IALE-Europe was accepted as an advisory member at the meetings for the implementation and follow-up of the Convention organised by the Council of Europe, in close interaction with the national or regional officers responsible for the implementation of the ELC in the national policies. Indirectly through its members, IALE-Europe participates in networks such as UNISCAPE, has become engaged in the European Landscape Forum, and is open to other related initiatives that may develop in the future.

Notwithstanding the great differences and similarities of European landscapes across bioclimatic zones, IALE-Europe aims to highlight the idiosyncratic nature of each European landscape by drawing the attention of researchers, policy-makers and laymen alike, to the uniqueness of each one landscape of the continent. Only in this way will European citizens appreciate the cultural heritage that these landscapes have carried through the ages of Europe's history and stimulate to adopt landscape-friendly attitudes towards them. In order to strengthen the required European approaches to landscape research, regional and national chapters are encouraged to become actively involved in on going discussions. IALE-Europe can only be successful in gathering European specific themes and approaches, and promoting its discussion, if it is supported by a large number of active members and regional chapters.

The challenges ahead

After five years of preparation the European Association for Landscape Ecology (IALE-Europe) was founded 13th of July 2009 during the European IALE Conference in Salzburg. The structure of IALE-Europe ensures representativeness in the IALE Council, facilitates the cooperation between European landscape ecologists and acts as a platform at the science-policy interface to assist policy making at the European level. Statutes ensuring a flexible combination of individual and national chapter based membership, including rule for the election of the IALE-Europe executive committee through the formation of a voting list with different programs for the development of IALE-Europe were established (see IALE Bulletin 30-1, 2012 and website www.iale-europe.eu).

IALE-Europe has two complementary guiding principles:

- (1) Strengthened cooperation with the international IALE and the national chapters, in order to highlight what are specific European landscape characteristics and processes, to value these specificities, and also to organize common approaches and cross-boundary studies of those processes that cannot be clearly grasped at the national or regional level. Further, IALE-Europe aims to support European researchers

being the leading force in the development of novel approaches and methods required to grasp the above mentioned specificity;

- (2) Reinforcement of the cooperation with all organizations and bodies, as well as with all members, researchers or practitioners that deal with and manage European landscapes, on multiple scales, as the questions and complexity they are engaged in is of a particular nature and deserves particular linkages. This should also allow for the identification of the main societal changes in Europe at each time, which relate to the landscape, and to support the required response from landscape ecology research in Europe.

Besides the enhanced cooperation among those who deal and work with the European landscapes, the main challenge faced by IALE-Europe is to be able to push forward the concept of landscape and landscape based approaches among decision-makers and in the different sectorial policies dealing with the European territory and its assets. This should be a way to support the innovative potential of Europe, moving away from standard solutions and partial perspectives. Stressing the place based approach is a way to truly combine the natural and the socio-economic factors and therefore address change and its management in accordance to each particular context. This is essential to reconnect people to their landscapes, and engage them in landscape.

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