

# INTEGRATED ENVIRONMENTAL PLANNING IN EUROPEAN COASTAL REGIONS

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## Abstract

In a metropolitan (urban-rural) landscape, the complexity and dynamics of societal developments no longer allow the classical role of the government and its policy instruments to be effective. The supply of blue-green quality (open space, scenery, nature, water) around residential areas, determining sustainable urban living conditions, is jeopardized by the current problems in landscape planning practice. Spatial planning needs to critically analyze the driving forces in the metropolitan landscape and why classical (rational) spatial planning is not effective anymore, in order to define new adequate ways of coordinating spatial developments. Issues that are particularly important for this analysis are the ineffective separation of rural and urban planning and of the public and private domain. The necessity, synergy and continuity with regard to the integration of these domains deserve to be submitted to thorough theoretical and practical analysis.

A major research challenge is to incorporate ecological, environmental and natural values in spatial planning to fight environmental deterioration resulting from urban sprawl and related rapid developments. Once the process starts, it is rather likely that sprawl of new developments and urbanization will continue until all available space is occupied due to advantages offered by proximity and built infrastructure. These objectives are so important in European coastal regions, where land-use pressures reach highest rates (especially at the Mediterranean coast). An European project has been started to study and to contribute to a solution for land use conflicting dilemmas at the urban-rural transition zones (metropolitan landscape), in order to assure transfer of knowledge from both practice and science to converge into a coherent body of knowledge.

In a nutshell the proposed research field has to explore the relations between land development i.e. building and land-use intensification with their effects on the sensitive coastal landscapes and on the other hand to explore mechanisms of incorporating natural, cultural and environmental quality values in the planning process. In addition to the locally-specific landscape transformation problems, nature- and human driven hazards, which may affect coastal systems and inner land stability of various regions in quite similar vain, will be addressed too. In this way the proposed research will pursue integrated approach to address all the above-mentioned issues.

**Keywords:** Coastal Planning; European planning approach comparison; Metropolitan landscape development

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## Introduction

Spatial planning is a process that aims at improving the possible future conditions of a specific area. In general, this planning process is cyclic, consisting of a set of steps through which it is applied (figure 1). First, it is necessary to identify the planning problem(s) and its nature, because the nature of the problem basically determines the sort of planning to be implemented, for instance urban or rural, economic, land use, transport or environmental related. Then, common objectives can be established by different actors. Thereafter, it is essential to describe and to analyse those systems that are related to the specific planning problem. Based on these objectives and the systems involved, it is possible to elaborate and evaluate different potential alternatives to solve this particular problem, and to select a most suitable plan. Finally, this plan can be implemented, monitored and adjusted. This is a very straightforward process.

Behind this planning process, however, there is a clear notion of diversity which not merely embodies all the disciplines and practices on which planning is based (Allmendinger 2002), but also the different ways through which planning is currently expressed, reflecting to some degree the variety of contexts in which it takes place

(Alexander 2003). Within these contexts, different type of actors, level of arena of interaction, purposes, cultures, norms and socio-economic and biophysical dimensions interact in specific ways (Alexander 1998). Therefore, instead of a static and homogenous approach, planning is more a dynamic process formed by the synergy between several *planning paradigms* (Alexander 1998) or *planning styles* (Vlist 1998). Basically, these are two similar concepts that portray the most influential theories not as loose strategies, but as complementary components of a unique planning approach (see also figure 1).



Figure 1. Different spatial planning *paradigm and styles*, and the spatial planning process (Valbuena, 2005).

The first *paradigm or style* defines the classical top-down ‘rational’ planning approach in which the central government paternalistically elaborates and implements ‘master’ plans. The second *paradigm* refers to a communicative approach that describes planning as a social interactive process in which different stakeholders reach a consensus. The third *style* looks at planning as a collaborative process through which public and private actors reach some kind of agreement. The last *paradigm or style* portrays planning as an agreement among different public actors, supported by a policy framework (Alexander 1998; Vlist 1998).

In the last decades, there has been a tendency in spatial planning approach, especially in Western world oriented countries. Planners have left their former role of decision-makers for a more advisory-oriented position (Alexander 2003), strengthening planning as a participatory field of decision making (Lane 2001). This means that, as a whole, planning has moved towards a more consensus-oriented activity, influenced not only by planners and scientific knowledge, but also by values, experiences, opinions and actions of different stakeholders (Allmendinger 2002). This general transition has been centred on the decentralization of the decision capacity of the central government, and on the participation of different stakeholders (e.g. citizens, NGOs). Despite of the theoretical suitability of these trends to overcome the limitations of the classical ‘rational’ planning approach (mainly the no achievement of the planning goals and the opposition of the people and institutions affected), the lack of local capacity (economical, technical, and prepared staff) to carry out this task, and the need for new methodologies to embrace stakeholders’ participation (including logistic issues, and power interactions between stakeholders) have hampered the assimilation of these planning trends (Dalal-Clayton, Dent & Dubois, 2003). Cultural differences between countries in Europe create differences in planning approaches and styles. Also, differences in economical and cultural development make it even more complicated to state that there is only one direction of planning paradigm development. To compare different stages and approaches in planning development spread over Europe a project has been started. In this project the participants will focus on the metropolitan coastal region, which is at least a 100 km in width. It is assumed that based on these differences, each country can learn from the other and applies whatever is necessary to guide the local process in its own specific direction, based on a planning style which suits local inhabitants and traditions. There will be not just one unique planning style that can be copied and pasted on each European coastal region, at least not for the coming 50 years. Cultural differences will still dominate global developments. A common approach and framework, however, might offer exchange opportunities and mutual inspiration.

## Metropolitan Landscape

In general, a metropolitan landscape is not only about the urban townscape (the build-up area) and its development, but also about the interaction with rural landscape and its developments. It is stated that urban development needs rural interaction for its existence and growth and without any urban influence the rural area can no longer develop. Given this necessary interaction, it is also obvious that in a metropolitan landscape, the complex-

ity and dynamics of societal developments no longer allow the classical role of the government and its policy instruments to be effective. The supply of green quality (open space, scenery, nature) around residential areas, determining sustainable urban living conditions, is jeopardised by the current problems in landscape planning practice. Spatial planning needs to critically analyse the driving forces in the metropolitan landscape and why classical spatial planning seems not effective anymore, in order to define new adequate ways of co-ordinating spatial developments. Issues that are particularly important for this analysis are the ineffective separation of rural and urban planning and of the public and private domain. The necessity, synergy and continuity with regard to the integration of these domains deserve to be submitted to thorough theoretical and practical analysis. During the latest decades many natural and rural landscapes over entire regions are being transformed into a metropolitan one, with:

- a) Severe environmental quality problems
- b) Growing threats of nature- and human-driven hazards, and
- c) Loss of natural and cultural heritage.

Expertise is needed in resolving land-use conflicting dilemmas at the urban-rural transition zone related to supply of green space, urban development, and nature and water management. Such planning objectives are gaining alarming importance in the European coastal regions, where land-use pressures reach highest rates; a good example is found around the Mediterranean coast. Main concern is the destruction of coastal ecosystems resulting from overdevelopment, urban sprawl, agricultural intensification in combination with consequences of climate change and possible sea level rise. Expertise is necessary to alleviate the specific problems at the congested landscapes of selected European coastal regions. To address these planning problems the started project promotes an *Integrated Environmental Planning approach (IEP) on European level for Coastal metropolitan Regions (IEPECR)*.

European coastal landscapes represent a unique set of human - and nature-centred values. The manifestation of the first will lead to the attraction of a multitude of economic, residential, recreational interests at the coastal fringe. These comprehend the “*new coastal economy*” (Suárez, 2004) and most often result in congestion of population, activities and structures in the coastal zone leaving the hinterland in a marginalized position. Consequently land-use pressures and conflicts drag environmental degradation and loss of natural and cultural values. The nature-centred values refer to the presence of the most rich in biodiversity and most vulnerable ecosystems at the coastal fringe, which continuously recede as the human-centred activities proceed. This interrelation is not always the case and considerable progress towards balancing the two takes place, as more sustainability values are getting incorporated in the spatial planning processes at different locations. Such good indications however do not yet have a great and widespread impact over European coasts, as the expertise to bridge the objectives of spatial planning and landscape ecology is scarce. Studying the complexity, richness and vulnerability of the natural ecosystems and the spatial manifestation of societal processes would allow for better understanding the relationships in between natural and societal processes, but would not improve the situation unless planning action is applied successfully. Successful results in ecological and environmental planning are numerous, but not where both the biological and societal competitions over limited living space with special environmental qualities are so intense. Coastal overdevelopment and urbanisation continues rapidly and especially over the Northern Mediterranean, where nearly 90% of the coastal outlet are expected to become urbanised until 2050 (Coccosis, Mexa, Collovini, 2002). At present this number reaches more than 70% for the seafront from Barcelona to Naples and few natural areas remain (UNEP, 1996). Similar trends are followed in the rest of the Mediterranean. Therefore an urgent need for producing strong and timely planning expertise in coastal landscape planning is eminent.

## Research Project

In a nutshell the proposed research project wants to explore the relations between land development i.e. building and land-use intensification with their effects on the sensitive coastal landscapes and on the other hand to explore mechanisms of incorporating natural, cultural and environmental quality values in the planning process. In addition to the locally-specific landscape transformation problems, nature- and human driven hazards, which may affect coastal systems and inner land stability of various regions in quite similar vain, will be addressed too. In this way the proposed research will pursue an integrated approach to address all the above-mentioned issues.

To assure thorough understanding of the presented issues merging the fields of landscape ecology, human geography, spatial planning and spatial development and their subtle match for developing a coherent coastal-landscape approach, partnership between partners, located at the West, South and East of Europe have been established and further international networking will be pursued. This partnership has to be arranged so as to allow for comprehensive and comparative regional studies to disclose patterns of dynamics of landscape mosaics in space and time, enforced by different planning cultures and types, with special focus on the patches of nature and build-up environment and their qualities

The science of spatial planning is interdisciplinary by nature, combining policy, social, economic, (landscape) design, and environmental studies (Valk, unpublished). The proposed research area incorporates an even wider range i.e. landscape ecology and GIS. Therefore special attention is devoted to manage the interdisciplinary nature of the research field and assure quality and coherence where art, social and nature sciences merge. The order of the research actions, presented in three levels of interdisciplinary studies are:

1. Biophysical and human geography studies within selected coastal regions; Spatial/environmental planning tools, instruments and models for refraining urban sprawl and its negative impacts on local nature and culture and hazard management; Development of GIS databases.
2. Assessment of ecological qualities of human-made (or modified) habitats; Evolution of land-use systems with their time-space dynamics; Evolution of land-use/environmental policies (and regulations) as well as best practices in integrated land-use planning; Construction of composite landscape model representing landscape features, e.g. in network structure and their dynamics; Modelling and simulation of scenarios with GIS (of future spatial and nature developments).
3. Construction of a framework of an ideal type of an *Integrated European Planning* system for coastal regions; Development of SDSS for coastal regions with urban sprawl problems.

To pursue an accomplished view and comprehensive results an integrated methodology has to be applied. The proposed methodology consists in combining: a/.Social sciences approach: grounded theory - case studies - ideal type b/.Landscape ecology approach: percolation theory – patch dynamics - GIS and c/.Planning research approach: scenario studies and stakeholders participation combined with modelling. In this way a trans-disciplinary research approach is constructed with triangulation of the analysis of spatial phenomena, research materials, sources and methods (combining scientific and non-scientific knowledge).

The interdisciplinary nature of landscape research and planning challenges the field difficult to steer within coherent frames, as its borders overlap with many disciplines (Landscape architecture, Site design, Urban planning, Ecology, Sociology, Policy studies). The proposed project aims to contribute to the elucidation of this field through ‘testing’ a wide variety of related research subjects and approaches. It will try to link Landscape ecology, Spatial planning and Geo-information to formulate a coherent approach for coastal metropolitan landscape research and planning. The expected development of the research theme at different universities can also contribute to preparing postgraduate courses to boost training in research and planning of coastal and other environmentally sensitive landscapes adding up to the more established intertwined urban and rural themes.

There are cases described where the coastal overdevelopment has deteriorated nature and environment to such extend that local authorities have decided to reverse the process i.e. demolish buildings, displace roads, switch to soft coastal defence measures (Ministry of environment - Spain, 2002), because it ultimately results in hindrance of important economic functions like loss of attraction for tourism. Such cases obviously display the need for an integrated approach to spatial and environmental planning in coastal regions, the need to introduce an element of planning for enhanced institutional and ecological resilience (Holling *at al*, 1995), and within the environmental limits/ecological carrying capacity.

The research programme will be developed through accentuating on the following themes:

1. Landscape-ecological studies through the development of an integrated GIS-based project to facilitate the study on spatio-temporal dimensions of landscape’s natural and cultural values in rapidly changing coastal areas under great urbanization pressures. For this purpose ecological, environmental and spatial parameters for landscape’s natural and cultural heritage values definition, change detection and mapping through remotely sensed data, GIS simulation and prediction has to be elaborated. This is necessary for improving integrated planning for instance for heritage conservation, applied for the case of the growing metropolitan regions close to the coast.
2. Spatial development studies by comparing different development stages in the researched regions to support and guide (other) regions for a more sustainable development or counteract on existing developments. Through comparing the present landscape resulting from spatial planning and spatial development in specific cultural, economical and physical conditions it is expected to disclose geographical patterns of the spatial development stages and their effects on the natural environment in the different European regions.
3. Time-space analysis of land-use systems and environmental processes: for this purpose the dynamics of the studied landscape mosaics will be examined in time-space perspective as the different land-use complexes need varying time and space scales to evolve and understanding these dynamics is essential for pursuing more sustainable use of the physical environment. In similar vein will be analysed time-space characteristics of the nature- and human-driven hazards i.e. climate change, sea-level rise, coastal erosion, landscape/environment transformations which destroy special habitats.
4. Scenario approach for planning studies - scenario development, -analysis and -visualisation for the separate regions will be applied for studying spatial planning and spatial development patterns. For this purpose natu-

ral and cultural settings of the studied regions will be coupled with stakeholders' objectives and institutional facilities.

5. Elaborating an *IEP* approach for metropolitan landscapes in coastal regions: development of GIS based Spatial Decision Support System (SDSS); construction of an ideal type of integrated environmental planning system.

The project deliverables (such as the PhD- and MSc theses, workshop reports and internationally published articles) would be beneficial for all decision-making parties related to the presented problems and specifically: 1. The implementation of Integrated Coastal Zone Management (ICZM) programme in Europe (recently launched by the European Commission); 2. The development of coherent policy packages containing measures and planning instruments useful for refraining urban sprawl at the coast, sensitive habitat preservation and restoration, mitigation of ecologically adverse affects while accommodating growth etc; 3. Support local and regional public authorities in strategic planning related to preservation of coastal regions' cultural and natural heritage, environmental quality and stability and consequently – maintain stable economic potentials.

The main innovation resulting from this project is introduction of the concept of ICZM Planning combined with facilitating metropolitan landscape development. Although literature does reflect the desire for a compelling metropolitan landscape and the problems of planning in regions that are townscape and landscape at the same time, a planning model that deals with the particular difficulties and dilemmas of this planning, combined with coastal planning has not been constructed before. Both the concept itself and the creation of that concept involve generating added value by combining domains that have so far remained divided, despite attempts to join them and the evidence that the division is counterproductive.

The separation between urban, rural and coastal planning, is clearly inefficient in the current Dutch planning practice but seems to be accepted as a part of reality (Van der Valk, 2002). Based on a clear image of opportunities and threats in current practice, the program points out what the synergy can be. The image of the dominant government that top-down protects those commodities that the market mechanism fails to provide is no longer valid (Centraal Planbureau, 2001; Bult-Spiering, 2003). The program wants to bring together public and private interests, mechanisms and perceptions in order to reposition the role of the government in the web of space-affecting forces with the objective to enhance the effectiveness of coastal landscape planning. Intensive interaction between the researchers and stake- and shareholders in the metropolitan landscape and coastal areas provides better information for the researchers, immediate feedback on preliminary results and awareness of need and complexity for the share- and stakeholders. Crossing borders between these three traditional divisions (rural, urban, and coastal) is innovative in itself and since it requires extensions and adaptations to the existing conceptual and theoretical framework, it results in a radically new model.

The project's side objective is to implement a structured research training programme, developed to support and prepare dedicated researchers who pursue careers in the field of *interdisciplinary landscape research and planning (ILRP)*. The cross-disciplinary nature of the field addresses very complex substantive problems, through wide range of methods, tools and techniques both for research and decision making, matching the results in potentials to deliver a huge variety of products (i.e. types of plans, strategies, policies). This diversity of problems, research and planning raises eminent difficulties for academics to develop coherent education programmes and train dedicated professionals. Consequently, the propagation of uncertainties and difficulties to implement a multitude of environmental policies, especially at the landscape level, display a major environmental change.

The main goal is to achieve common and coordinated research approaches in the field of coastal metropolitan regions on European level. This is essential to counteract the high degree of fragmentation in the field, given that land-use planning is very country- and region-specific. Being so, and being approached by many teams of researchers, straggling to cover the huge variety of related issues, it is not easy to develop coherent planning and management packages for resolving the problem of European coastal landscape congestion and environmental degradation.

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