

Architectural Design Strategies for the Rural Architecture development in Europe.

Author Tiziano Cattaneo
*Università degli Studi di Pavia, Department of Civil Engineering and
Architecture, via Ferrata 3, Pavia, Italy.*

This article is a revised version of a paper translated in Chinese and published in *Urban Architecture (UA)*, 2015(1):109-111, 2015. ISSN: 1673-0232, CN: 23-1528/TU. (Chinese). This article is the original version of the manuscript in English and has not formally published elsewhere.

Architectural Design Strategies for the Rural Architecture development in Europe.

Tiziano CATTANEO,

Department of Civil Engineering and Architecture, University of Pavia, Pavia, Italy
tiziano.cattaneo@unipv.it

Abstract

The aim of this Paper it is to present a research project, which derives from Italian National Research Framework PRIN2011-2013: "Regeneration and renewal of rural landscape. Building strategies in the surroundings of new urban centres". This issue aims to the regeneration of the rural landscape, with particular focus on architectural design, which can become the instrument for promoting the value, the memory, the identity and the environmental quality of the rural landscape as cultural heritage.

The awareness of the fact that the categories "rural" and "urban" appear meaningless, where it is a question of marking out the boundary that do not have a well-defined specific function and that are increasingly characterised by mixed complexity – economic, functional, social and cultural – leads to reviewing the strategic guidelines of managing the landscape and draws increased attention to the qualitative aspects of the landscape development and the human-environment relationship.

A second very important aspect to point out is the resilience of the architecture in this concept of rural intensification: in landscape construction, every measure involves the subject of shape and space. From the building of a small footbridge to the renovation of the banks of a large stretch of river, from a project for a urban plaza to one for a roof garden or a park, it is difficult to tell the difference between a region's natural and man-made structures, since they should be always connected and interrelated.

Keywords: Rural-urban boundary, Human landscape design, Eco-social design, Architecture design

1. Introduction to the Rural Architectural Intensification

The paper describes methodology and results, even if partially, of a research project that derive from a biennial Italian National Research Program (PRIN2011-2013) "Architecture as Heritage: innovative instruments for the tutelage and the improvement of the local border systems"; within this National framework authors from University of Pavia (coordinate by Prof. Tiziano Cattaneo) participate, deepening the theme "Regeneration and renewal of rural landscape". This issue aims to the regeneration of the rural landscape, with particular focus on architectural design, which can become the instrument for promoting the value, the memory and the environmental quality of the rural landscape as cultural heritage. Authors expose a operative action for the regeneration of rural heritage with a specific application to Rural Architectural Intensification (R.A.I.). Rural Architectural Intensification is an innovative design action for architecture and landscape design. This operative action is applicable for regenerate and transform the contemporary city-landscape into use that are suitable for contemporary ways of living through the construction of a new paradigm that will shape an architectural project committed to sustainability.

The concept of Rural Architectural Intensification include three words:

Rural as high quality environment with richness of history, values, memory and identity;

Architecture as a process and construction product, which can create social, cultural, economic and technological innovation;

Intensification as a strategy for creates sustainable density of activities and spaces for citizens in which the natural environment and the rural-urban environment coexist harmoniously.

Moreover, the term rural has to face the modification of the economy system and needs also to be rethought it in terms of definitions. In different disciplines we assist to a controversy related to the distinction and definition of the terms *agrarian*, *agricultural* and *rural*.

In Geography, for example, the three terms are defined as follow: the agrarian geography is concentrated on the line of intervention for the agricultural development; the agricultural geography is related to the morphological form of the earth and, finally, the rural geography is the most recent discipline that investigate the whole rural space as the extra-urban territory. The term *rural* seems to take in account the technological and social evolution of the countryside. The countryside has to deal with different issues: the city, the multi-activities, and the climate changes. Furthermore, the term *rural* considers all the different elements of this non-urban territory affected by a continuous transformation.

2. The role of Architecture in the process of intensification of the rural context

The developments of European cities and their speedy urbanization have created a perception of contemporary space like a homogenous continuum in which city and territory have lost their origin boundaries. So, the concept of boundary in the European cities includes some enlightenment – social, cultural, economic, geography, architectonic - and the rural landscape itself becomes a boundary, and it represents the real contemporary city-landscape.

The crisis in rural areas is essentially a European problem: depopulation and ageing of the population, abandonment and decay of small town centres, difficulty in keeping existing businesses, intensive agricultural practices to the detriment of biodiversity, pollution, a lack of infrastructures and services for tourism, as well as a shortage of job opportunities for the population, etc.

The project addresses the specific cultural and productive features in the European areas in which this phenomenon it is processed and has reached significant levels of deprived neighbourhoods; like a big boundary whose either urban and rural shape cannot be surrendered to simplifications imposed by tourism's occupation, but towards hypothesis of regeneration the rural landscape of old villages and farm buildings.

The aim is to identify the Best Practices which can be assessed in a qualitative way through the description and interpretation of operative tools for architecture and landscape design that allow to regenerate and transform the contemporary city-landscape into functions that are suitable for contemporary ways of living. The rural landscape has seen a tendency to overcome the urban growth culture and quantitative development that had left a strong mark, represented by the negative concept of the countryside – only diversified by the varying quantities of building and non-agriculture related activities, and thus a decline of the concept of nature.

The awareness of the fact that the categories “rural” and “urban” appear meaningless, where it is a question of marking out the boundary that do not have a well-defined specific function and that are increasingly characterised by mixed complexity – economic, functional, social and cultural – leads to reviewing the strategic guidelines of managing the landscape and draws increased attention to the qualitative aspects of the lands development and the human-environment relationship.

We would underline the importance of the role of the Architecture in the process of intensification of the rural context for the landscape construction that involves the shape of the space. Rural Architectural Intensification means that every architectural intervention in the territory - from a small pedestrian bridge to the regeneration of the river banks, from the public space design to the project of a roof garden or park - have to restore the relationship between landscape and architecture as the history has taught. Through the Rural-Architectonical Intensification, it is possible to create sustainable density of activities and spaces in which the natural environment and the rural-urban landscape coexist harmoniously.

Then think of the existing richness: in European's rural areas, not just its cities, the artistic and architectural heritage is often of a very high cultural level and this just brings the subject of architecture into the centre of this debate. In a region's various implementation strategies there must be an aspect of independence, of a close relationship and a necessary connection, not just at the level of regional marketing but above all in the construction quality of these measures and of their economic and environmental sustainability.

Enhancing rural architecture, small towns, farmsteads and ancient relics is one of the main components for the regeneration of the countryside. It is a strategy with a positive outcome, even only if it has been supported simultaneously by the possibility of creating more business (also working from this architectural heritage), but which nevertheless is planned taking into account the improvement of the perceived aesthetic structure of the countryside. Therefore, in this development process for business in the region, there also has to be an increase in environmental quality and in the infrastructures, which allow people to use the environment, etc.

The development of small and medium-sized enterprises also forms a possible opening strategy, but in this case as well, only if it allows the possibility at the same time of reusing the existing building heritage or at least respects its presence as a unique value for a region. In the meantime, small and medium-sized enterprises should be supported by specific services, such as access to information and communication technologies, and they must also have new types of sustainable infrastructures for the environment which allow businesses to establish themselves in a region and to promote new initiatives. The protection of biodiversity, as well as new models of organic and bio-dynamic farming, can translate into opportunities to diversify the range of services towards other economic sectors as well, such as tourism.

3. Process and research's Parameters

The parameters set out below have been identified through the deeply analysis of the priorities for the European Community for the rural development.

The EE.UU strategic guidelines aim at the integration of major policy priorities and for each set of priorities, illustrative key actions are presented.

The strategic guideline of the European Community are here summarized:

1. Improving the competitiveness of the agricultural and forestry sector.

Europe's agricultural, forestry and food-processing sectors have great potential to further develop high-quality and value-added products that meet the diverse and growing demand of Europe's consumers and world markets.

The resources devoted to axis 1 should contribute to a strong and dynamic European agri-food sector by focusing on the priorities of knowledge transfer, modernisation, innovation and quality in the food chain, and on priority sectors for investment in physical and human capital.

2. Improving the environment and the countryside

To protect and enhance the EU's natural resources and landscapes in rural areas, the resources devoted to axis 2 should contribute to three EU-level priority areas: biodiversity and the preservation and development of high nature value farming and forestry systems and traditional agricultural landscapes; water; and climate change.

3. Improving the quality of life in rural areas and encouraging diversification of the rural economy

The resources devoted to the fields of diversification of the rural economy and quality of life in rural areas under axis 3 should contribute to the overarching priority of the creation of employment opportunities and conditions for growth. The range of measures available under axis 3 should in particular be used to promote capacity building, skills acquisition and organisation for local strategy development and also help ensure that rural areas remain attractive for future generations. In promoting training, information and entrepreneurship, the particular needs of women, young people and older workers should be considered.

4. Building local capacity for employment and diversification

The resources devoted to axis 4 (Leader) should contribute to the priorities of axes 1 and 2, and in particular of axis 3, but also play an important role in the horizontal priority of improving governance and mobilising the endogenous development potential of rural areas.

Beside to this important document by the European Commission, what we are interested here is the role which architecture has to play in this framework of rural intensification. In order to this reason was built the R.A.I. Best Practices Report and it is a basic reference in which many experiences from all over the world have been classified and assessed in order to find general criteria. So, considering that R.A.I. application depends on the characteristics of the territory in which it should work, once the main aim is defined, planners or designers analyse the territory starting from available net information. Based on the characteristics of the analysed territory, decision makers and stakeholders define specific aims such as for example: concentration of new commercial activities in existing small centers, creation of a system of mixed use small centers, creation of a decentralized hotel, definition of territorial facilities, distribution of residential settlements in existing underused buildings, renewal of existing rural settlements, etc. Obviously, territorial interpretation depends on certain specific aims: in fact different spatial or economic factors may have particular relevance for each specific goals. At the same time the entire Best Practice database can be consulted and appropriate examples may be selected. Lastly a compatibility assessment among the territorial interpretation and the selected case studies carries to possible scenarios that decision makers and stakeholders should consider.

At this point the question is: What parameters can be used to assess the improvement of a rural region?

In the Best Practice Report built for the main aim R.A.I., each project is catalogued by four parameters:

- a. Development of local business capability;
- b. Development of cultural and tourist activities;
- c. Environment preserving;
- d. Facilities for population.

With more details:

- a. Development of local business capability: business and tourism, diversification into non-agricultural activities, diversification and innovation in agriculture, cultivate the landscape, cooperation and short chain, growth of the bio-economy, business and infrastructure;
- b. Development of cultural and tourist activities: tourism and architectural heritage, tourism and environment, small-scale tourism services, countryside vs sea and mountain, tourism and water, tourism and infrastructure, tourism in less-favourable areas;
- c. Environment preserving: environment and biodiversity protection, environment as heritage, environment and water, soil and environment, environment and animals, environmentally sustainable operations, limit consumption of the environment, bioenergy, environmental reservoirs, environment and urban space, environment and infrastructure, environment and waste, environmental risk, environment in disadvantaged areas, diversified environmental redevelopment;
- d. Facilities for population: population and employment: tourism, population and employment: diversification of agricultural activities, essential services to the population, country-city,

population: energy saving, young population, population: infrastructure, cooperation in development, safe population, population and environment.

Thanks to the above parameters of intensification identified, we analysed numerous architectural case studies through a double movement: for each parameter we identified a series of goals and strategies which generate positive strategies in the territory through which we have evaluated the production of Rural Architectural Intensification. The overall framework has been interested in terms of quality and design's behaviour. (See Figure 1).



4. Case studies

In this section are introduced six projects description that are included in the R.A.I. Best Practice Report as examples of the virtuous architecture of Rural Intensification.

This article not intends to make a detailed and analytical description of the R.A.I. Best Practices Report (which is composed by 140 case studies and more then 500 pages) but authors believe it is important to outline the concepts and the goals description of the parameters that can be used to assess the intensification as design strategy for rural architecture heritage.

4.1. Müritzzeum. Aquarium and Eco-museum

Waren, Müritz, Mecklenburg-Pomerania, Germany.

The Müritzzeum is a visitor centre and nature discovery centre for the Müritz National Park, located on Lake Müritz, near the town of Waren in the north German state of Mecklenburg-Vorpommern.

The concept of the visitor centre is to have a enjoyable and interactive science-based approach to the themes of nature and regional history. The exhibition and aquarium area is devoted to the presentation of the flora and fauna and history of the Mecklenburg Lake District. Its centrepiece is the largest aquarium for native freshwater fish in Germany, with a capacity of 100,000 litres. Thematic

exhibition areas cover the underwater world, birds, forests, the region's history and the moor. There is also an adventure garden and adventure playground. The film in the site's multi-vision cinema gives overview on the checkered history of Mecklenburg. The scenic beauty of the region is always to the fore.

The building is entirely covered with charred larch wood. Just as the Mecklenburg Lake District is known as the "Land of a Thousand Lakes", the Müritzeum describes itself as the "House of a Thousand Lakes". As a visitor centre, the Müritzeum provides information for visitors and tourists about the cultural and tourist attractions of the Mecklenburg Lake District and the Müritz National Park. The Müritzeum is supported by the collections of the Müritz Museum, with its 140-year history, the Natural History Collection of the State of Mecklenburg-Vorpommern and the Müritz Aquarium. The Müritz Museum was the precursor of the Müritzeum. In 1866, the first collection was created when Hermann von Maltzan founded as the Maltzan Natural History Museum for Mecklenburg (Maltzan'sches Naturhistorisches Museums für Mecklenburg) or Maltzaneum for short.

At the Müritzeum, as part of the Natural History State Collection of Mecklenburg-Vorpommern, are about 275,000 exhibits, especially molluscs, insects, eggs, bird specimens, antlers and a geological collection. The extensive library of approximately 16,000 volumes, mainly focuses on "Mecklenburgica" and scientific literature on botany, zoology, geology and natural history.

4.2. Accessible Ribadeo. Vertical connection between the historical centre and the coast.

Lugo, Galicia, Spain.

Ribadeo is located in the north-west of Galicia, at the border with Asturias and edging the estuary which bears its very same name. It has a protected historical quarter, a marina and a commercial port, which is strategically located in the Cantabrian coast.

Ribadeo is a favourite summer holiday destination not just for people from the Lugo province, but also from people from every corner of Spain.

We could highlight then two outstanding features in the region: on the one hand, a consolidated population, a population with a future, and growing tourism both sporadic and regular. On the other hand, a villa swinging in between two ends: on one end, the marina and commercial port; on the other end, the historical quarter.

Connecting the port to the historical quarter poses a difficult challenge: a difference in floor level of more than 20m, approaching 40m if we include the square of the city council. It turns out to be quite difficult to organize a landscape in which the two main focus of attention are in parallel plans and never intersect because they belong to different worlds.

People living at the historical quarter find it difficult to get to the port. Tourists getting to the port or the marina find it difficult to get to the historical quarter. The landscape conditions lead us to a situation of total ignorance of the other world. They do not leave us any other option than overusing the car, which, under different conditions, could easily be unnecessary.

The port follows a linear development bordering the estuary. First, the commercial port; next, the marina, and the old loading port to the end, outshined by the Santos bridge crossing the estuary at some 40m height and connecting Asturias and Galicia. Port premises, installations and facilities, and nice restaurants shape and characterize a recently established seafront promenade.

Its lack of dynamism has neglected and brought into disuse a few buildings of interest. The problem has been put forward: improving the connections between both worlds; transforming, or using the difference in floor level as a connection hub. The city council launches a call for proposals through an ideas contest. There are no budgetary constraints. There is not a program where needs are clearly defined and specified, nor a specific location or intervention site. There is just a problem which is calling for a solution.

4.3. Rural Community

Paredes de Coura, Viana do Castelo, Portugal

Located at Chã de Lamas the Environmental Center, main building of Corno de Bico Protected Landscape, was built within the existing complex of Boalhosa agricultural colony, a work of the National Settlement Board (late 1950's).

The colony represents one of the rare complexes built upon a planned landscape and social housing with a rural context, a plan developed in the 1950's by the National Settlement Board.

From the original plan the settler houses, the community oven, the school and the teacher's house were built; only the church remained not built.

As the building's needs in terms of space were greater than those the existing buildings could withstand, and as the necessary enlargement would jeopardize the balance of the complex, it was necessary to find a new and specific location for the Environmental Center's building.

The Environmental Center project is based on a renovation strategy to revitalize the entire complex, by performing a factual analysis of the 1950's project and of the existing buildings. It proposes the site

and program of new volumes using functional analogies in order to have a minimum impact on the colony's overall image. The proposed new volumes will always interconnect with the existing ones via small passageways, which link them. The volumes are distanced between themselves in order to allow an individual view of each of them and also permit, when arriving from the south, an overall view without changes above the two pre-existing equipment.

We establish as premises the renovation of the existing buildings in order to clear away the additions and modifications made to them throughout the years and to maintain their original characteristics. The materialization of the new volumes is made of an exterior cladding of wood, which, by differing from the existing buildings, will allow for an individual view of each period. The choice of wood for the new buildings, a natural material that is transformed in the own language and in the general image of the protected landscape, enhances and accentuates the modern character of the existing buildings.

4.4. Suburban House. A contemporary rural living

Zoetermeer, The Netherland

This project is a private assignment for an entrepreneur from the city center, and the question was posed, how could the family find peace on the edge of that same city. The site located where the city and open planes meet, and therefore has an obvious recognition that cannot be ignored. In the earlier times people here used to work with shapes for houses that were pure and plain, haystacks were used as a cover for the roofs and the walls were made out of stones and a clay plaster.

The architect was challenged to fuse together traditional ideals with a contemporary house design, a cubistic shape placed in a desolate landscape, where all urban feeling is gone when you look at the surroundings.

Contemporary rural living was chosen as a project to mix the two in pure form.

When working with pure forms it's also important to look at simplicity, durability and expression. The mix of two very different but recognizable materials in the Dutch landscape results in a both a modern and traditional structure. The fine texture of the haystacks in combination with the smooth white plaster surfaces a house is formed that is very modern and traditional at the same time. The compactness of the haystacks gives optimal protection against the elements.

The interior successfully combines natural materials creating something unique. By designing a natural interior certain tranquillity arises throughout each room and now there is also room left for the residents to restyle their space continuously.

One of the priorities while designing this house was to provide the residents with a magnificent view of the scenic landscape. This was successfully done within each room in the house. Daylight falls deep into the house and lights up the space within and gives it a dynamic character during the day, while by night the house radiates its light to its surroundings and thereby marking its position in the landscape.

4.5. Green Water Sports Station

Pszczyna, Slesia, Poland

Like a traditional polish farm, the Green Water Sports Station blends into the rural landscape of the shores of Lake Laka in Upper Silesia (Poland).

Three main buildings of the complex - situated orthogonal to each other – define a public place. This place comes into being on the same way like it occurs in the typical polish manor between the cottage, stable and barn. And analogical to them, every building of the Station has a different function: the boat hangar in the east, the central visitors building on the waterfront and the restrooms with showers westward.

The outer form of the buildings is inspired by the neighbouring, rural architecture with its formal clarity, double pitch roofs and pleasant proportions. Instead of pastiche of the rustic forms, all details are modern and simple, but well thought out. The dressy facades and roofs are planked with charcoal coloured fibre-cement panels. The roof and the façade of each building melt that way into one monolithic body. Colourful windows and vitiated air pipes implemented into the dark surface of the outer skin generate bright contrasts and quasi musical rhythms.

4.6. Cultural Centre SDK. Multifunctional architecture

Służew, Mokotów, Varsavia, Poland

Built on a narrow strip of land remaining amidst 1970s developments, designers have designed a renovation of 'Służewieckiego Domu Kultury' (SDK) in a way that maintains the original center's humble nature, but greatly expands its program and accessibility - creating a hub for music, art, education, technology, and ecology. The site's agricultural history, the existing eco-farm, and local code restricting the height to six meters drove the design. Before the urban development encroached on the landscape, farms and individual houses dominated it. Emphasizing the importance of its

agrarian past, the petting zoo has been moved to the heart of the project and surrounded by constructs resembling former local dwellings. Voluminous program such as the concert hall, rehearsal rooms, and audio-visual labs sink into the earth to reduce their visual impact. Smaller homestead-like structures rise out of the ground enclosing each program individually. Although the design generally employs traditional materials, several glass walls reveal the activity within, and open views to the neighbouring *śluzewiecki* stream, re-connecting the center with its history and context.

By adapting a traditional form of a farmstead, the design is not only deeply set in the tradition and culture of the place, it also shows respect for the borders of urban and functional zones and in a way employs a sort of convention of children's iconography. Due to placing the main function of the building on -1 level (below the ground), the ground-floor level has been treated as an open, public space where relatively small, traditional in form and material houses are constructed.

The final form of the Cultural Centre design was determined by two elements: the first, the situation and an urban context of the object, the second, and its function defined by the programme. The existing, original cultural centre was also a source of inspiration, together with the adjacent ecological, educational farm and a survived country house. A typical rural, low-density housing prevailed in the area of *Śluzewiec* until the early seventies of the last century. Then, throughout the course of a few years, in place of plough-lands, orchards and meadows where the sight of grazing cattle was quite common, high-rising blocks of flats, the tallest 11-storeys high, were being erected to become *Śluzew* on the Valley settlement. The designers of the settlement managed to preserve a green ravine along the brook banks, in spite of plans designating the area for single-family housing. Nowadays this place, a strip of green open space, is extremely precious both for the inhabitants and the ecosystem of Warsaw.

5. Conclusion

For over a decade, various projects for the intensification of rural areas have been launched over Italy and Europe. These are multifunctional measures that aim to develop businesses, especially those linked to tourism and cultural activities, or linked to the improvement of areas of society which have often deteriorated. At the same time, these measures aim to protect and enhance the natural environment.

In fact, the idea was to stimulate a whole series of various intervention models in rural areas. As a whole, these models would add to the development of rural regions. They would build a management system for goods and services based on innovative forms of multifunctional businesses. This would ensure adequate flows of income for those involved in these initiatives and would therefore help to guarantee the success of the work carried out on the goods, which the region has to offer.

In Italy, for example, the same Rural Development Plans which every region has prepared, as well as the National Rural Development Plan, confirm the need to intensify multi-sectorial, multi-axis projects with regard to the protection of the environment, the development of local business skills, tourism and cultural activities, as well as services for the local population.

This need for multi-model and multi-sectorial intensification would seem a given fact for anyone who, in theory and practice, plans, designs and carries out concrete actions in a rural region. The idea of area micro-projects organised by macro-projects, which theoretically should help the single management, is often found in local implementation plans and programmes.

The reality is very different and often when something does occur, it happens with such erratic and fragmented reasoning that it only creates partial success, which is too limited to represent real, concrete development for the region. In most cases, there is not even any intent during the planning phase to prepare any multi-model and multi-sectorial intensification measures. It just works through impermeable districts, while in the region as a whole even a route from one municipality to another will interrupt the building of a cycle path.

In fact, even the aforementioned Rural Plans, developed through a series of objectives and strategies belonging to different models and axes, do not specify that these connections are necessary, these intertwining objectives and strategies which need to be put into effect. There still seems to be little awareness of this issue and with it the possibility that the implemented measures have a resilient effect on the region.

Conversely, in our opinion, it is a decisive issue when:

- The measures do not reach sufficient concomitant, multi-sectorial development and they are not able to simultaneously be strategies for the protection of architectural heritage, the natural environment, the population and for tourists;
- There is no real recovery and they do not create the conditions in the region that could stimulate economic, social and cultural growth.

Only the combination of architecture and measures seems able to provide results in terms of quality: this intertwining of measures and also therefore of the regional policies which are studied and put into effect at every level and on every regional scale.

The relationship which links and connects all the components involved in development processes cannot be separated, just as a small town or a small architecture is inseparable from its own history, from its surrounding natural and man-made elements, its forests, fields, industries, and infrastructures which outline its surrounding landscape.

Bibliographical References

[1] Setting the Community's priorities for the rural development programming period 2007 to 2013. Official Journal of the European Union 2006: <http://ec.europa.eu/agriculture/statistics/rural-development/>

[2] ACHLEITNER, Friedrich. Le terme di Vals. Pietra e acqua. Elementare profondità. In *Casabella* n. 648. Milan: Mondadori, 1997, p. 61.

[3] ROSSI, Aldo, CONSOLACIO, Eraldo, BOSSHARD, Max. *La costruzione del territorio. Uno studio sul Canton Ticino*. 1ª ed. Milan: Clup, 1986. P. 31.

BEURET, J-E., KOVACSHAZY, M-C. Rural amenities policies: future stakes, in: G. P. Green, S. C. Deller, D. W. Marcouiller, Amenities and Rural Development. Theory, Methods and Public Policy, University of Wisconsin–Madison, USA Edward Elgar Cheltenham, UK - Northampton, MA, USA, 2005, pp. 33-47.

CATTANEO, Tiziano. "Water as a composition element of the landscape", in: T. Cattaneo, "Architecture&Landscape design", Maggioli Editore, Santarcangelo di Romagna, Italy, 2011, pp. 12-29.

POTOCNIK, J. European Commissioner for the Environment, "Guidelines on best practice to limit mitigate or compensate Soil Sailing", Published by European Commission, 2012. http://ec.europa.eu/environment/emas/news/archive_en.htm.

Prokop, G. "Corine land cover technical guide 2006 raster data", Published by EEA (European Environment Agency), 2011. <http://www.eea.europa.eu/publications/COR0-landcover>.

www.raintesification.com