

ECOLOGICAL APPROACH IN REGENERATIVE DESIGN: LANDSCAPE URBANISM AS AN OPPORTUNITY TO RECOVER INDUSTRIAL ABANDONED SITES IN LIÈGE

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INTRODUCTION

Rethinking industrial abandoned sites means to look at those productive landscapes, who forged the cultural and physical identity of the territory, and to consider them in a new perspective. The urgent issue, rising from the de-industrialisation process, consists in elaborating strategies to activate new life cycles in brownfield sites, in order to revive places and to regain the lost balance between environmental resources and human actions. The paper retraces the emergence of ecology as the basic value in regenerative strategies, where the design process involves ecological dynamics, in order to activate both environmental remediation and urban re-appropriation. This approach invests the thematic researches of the *Laboratoire Ville Territoire Paysage*, (Faculty of Architecture, University of Liège), where the act of reading the Meuse valley, within its morphological and cultural dimensions and the study of their interactions and changes in time, are intended to orientate the design process to an evolutionary vision. The case study of Esperance Longdoz industrial site, as the object of my graduate thesis project, was an opportunity to discover an interdisciplinary approach in architecture, broadening the concept of design process, including new parameters as: the multi-scalar dimension, the overtime changes, the different layers of landscape. But it also represents the starting point for a wider reflection in the Phd research focusing on the study of the effects of using vegetal structures to recover brownfields of the Meuse valley.

LANDSCAPE URBANISM: FROM A FUNCTIONAL LOGIC TO AN ECO LOGIC APPROACH

Transformations in Liège landscape express the vision of 'territory as an object of construction, as a sort of artefact', where natural elements have been manipulated in order to respond to social needs.¹ From the modification of watercourses to the extraction of coal, the territory has been overwritten, re-shaped following a functional and economic logic all along the XIX century. The industrial development in the Meuse valley has taken the form of a rhizome, where mines and metallurgic industries have grown on strategic areas, making visible the presence of local resources through the installation of exploiting "machines".² Transport infrastructures, connecting one production pole to another, have woven a territorial tangle, crossing and fragmenting urban areas, thickening the distance between towns and the river.

The deindustrialisation process has left huge inaccessible areas inside the urban fabric, opening the debate on territories reuse, where the labour model who generated them, ceases to exist. The

Meuse valley, as a territorial sample, reproduces phenomena that have affected many European and American regions, and have promoted innovative reflections and realisations concerning the regeneration of industrial abandoned sites. From these experimental projects and theories, Landscape Urbanism emerged as a new discipline dealing with urban reclamation, which might 'be measured in three ways: first, in terms of the retrieval of memory and the cultural enrichment of place and time; second, in terms of social program and utility; and third, in terms of ecological diversification and succession'.³

At the beginning of 2000's, by extending the reflection on post-industrial sites to abandoned urban areas in general, Landscape Urbanism became a new planning method, based on the ecological approach. In fact, variability and incompleteness, as the main features of landscape, might be considered as 'an antidote to the implicit finitude of zoning'⁴, who has proved unsuitable for dealing with the contemporary city, who is 'variable, characterized by continuous micro changes'⁵. Thence, the success of this new hybrid discipline lays on its productive attitude towards 'indeterminacy, open-endedness, intermixing and cross-disciplinarity'⁶ opposing to the outdated concept of 'static composition'⁷ of town planning.

ECOLOGY: FROM A SCIENTIFIC DISCIPLINE TO A LANDSCAPE DESIGN VALUE

From the second half of the last century, ecology has been recognized as one of the most important value in landscape design, together with aesthetics and social involvement and its interest has extended from the biological sciences field to the urban design approach.⁸ The term *Oecologie* dates back to the German biologist Ernst Heinrich Haeckel (1834-1919), who defined it as 'the study of the natural environment including the relations of organisms to one another and to their surroundings'.⁹ Later, the geographer Carl Troll (1899-1975), by observing the interactions between ecosystems and environment, introduced the concept of *landscape ecology*, defining it as 'the study of the main complex causal relationships between the life communities and their environment in a given section of a Landscape'.¹⁰ Landscape ecology still concerns the study of species, their associations and their succession in specific areas, called *landscapes*, including both natural and human actions, but only in 1969, thanks to Ian McHarg's work, has ecology involved as a main parameter, in the urban planning process.¹¹ By the criticism of the anthropocentric view and of the model of growth based on economy, McHarg highlights that man, as part of the biosphere's ecological system, must take into account natural elements and dynamics as components of his habitat, and he must include them as basic values in territorial transformations. Therefore, according to the writings of the biologist Eugene P. Odum, it appears clear that ecology 'has emerged from biology as an essentially new, integrative discipline that links physical and biological processes and forms a bridge between the natural sciences and the social sciences'.¹² Even if today's attitude towards environment has changed, natural elements are often just "insertions" in design process, not considered as life-cycle activators, but still subjected to profitability of land value. The study case of Seraing attempts to actualize Mc Harg's theory in Liège's post-industrial landscape. The vegetal structures are considered the leading factors in the recovery of the site for their capacity to restart natural processes.

ENVIRONMENTAL ETHICS: A PRECONDITION FOR THE ECOLOGICAL APPROACH

Since the energy crisis in 1973 until the recent climatic events, linked to the global warming, the effects of exploitation of natural resources have generated an increasing awareness about the dependence of human life on environment and the need to reduce the ecological footprint.

The landscape architect Alan Ruff underlines that the new sensibility toward the environment derives from a consciousness about technology's failings, and affirms the necessity to build the future upon 'the capacity to work within the natural limits of environment', respecting natural factors as air, water, soil, climate, flora and fauna.¹³ Therefore he proposes seven guidelines to design 'ecologically inspired landscapes', where the visible aesthetic quality of designed landscape reflects 'positive environmental change'.¹⁴

The concept of “sustainability”, introduced by the Bruntland report in 1987, embodies the will to re-establish a balance between quality of life and the respect for nature, as the responsibility to guarantee the survival of future generations on the Earth.¹⁵ Thence, in contemporary landscape design, ecology is interpreted as a key approach, concerning mostly regenerative design. In fact landscape design deals with urban development strategies, interventions on urban fringes, reclamation of waste lands: in all cases the landscape design process aims to restore the interrupted balance between natural resources and anthropic actions. According to J.T Lyle, this innovative concept considers design as the cultural instrument that gives form to physical phenomena, where ‘deep form’ shows the invisible natural processes and must be preferred to ‘shallow form’, as a merely contemplation artefact.¹⁶ As a revealing device, the regenerative design accompanies not only landscape transformations, but also the relationship between communities and the spirit of the places. Thence, recovery strategies are oriented to build a new identity, especially in rejected areas, where society can re-discover and re-appropriate abandoned places.

SERAING: A CASE STUDY FOR THE ECOLOGICAL APPROACH IN A RECOVERY STRATEGY

In this perspective, the Esperance-Longdoz industrial site represents a case study within the constellation of “derelict lands” left by the phasing out of the steel production chain, along the Meuse valley. The specific project describes how the re-interpretation of natural and artificial traces, the observation of ecological undergoing processes and an attentive perception of the places become the basic actions to recover the site. The hypothesis is that the identification of available areas and the study of their inner characters allow to inscribe them in a new system, where the landscape approach is proposed as a reactivation device. The site, extending for 30 hectares on both sides of the river Meuse, includes: the blast furnace, warehouses, slag depot areas, altitude gaps, lead tracks for the material transportation, spontaneous green belts and also a boardwalk, as gas pipes support, called *passerelle de l'Espérance*. Complexity, as the main character of the site, appears as an obstacle to the understanding of its morphology, but it also constitutes its inner “deep form”, releasing a mysterious fascination. After a *de-constructive analysis*, to classify the existing artificial and natural structures, the site is *re-composed* using the diversified elements as complementary instruments to recover the site.¹⁷

As mentioned, “Working with nature”, in landscape urbanism, means to activate processes involving plants, animals and people, with the aim of improving the quality of life in urban environment. Therefore ecology is strictly linked to aesthetical and social aspects: landscape design must relate spatial values, by reinterpreting and enhancing the characters of the places, with social values, by introducing activities to strengthen social interactions. Thence the design process is structured in three phases, where different actions are oriented to the progressive re-appropriation of the site. The first step is to **open the «neglected areas»** by transforming the existing boardwalk in a new footbridge. The physical effect of crossing a border is also intended in a psychological and cultural dimension. The act of “discover” implies to recognize “artefact landscapes” as identities but also to seize and understand spontaneous processes, for example to understand that the acid soil, product of the industrial activities, is the ideal condition for the development of a specific habitat, a precious biodiversity site, to observe and preserve. The ecological attractiveness of these typical urban forests, grown on coal slag heaps, lead citizens to reconsider the site, which is perceived as a new green area inside the town, but also as an identity element, linked to the social history of the town.

Then, in as second phase, different methods **to interact with soils** are proposed: testing phytoremediation, tracing new paths, modelling the ground. According to morphological characters of the site, this intermediate stage, involves ecological dynamics to prepare the areas for new uses. The project focuses on this phase in order to apply an ecological approach on a remediation strategy. The realisation of wetlands, as like as phytoextraction fields, have a double effect. As a matter of fact, the interaction between water, soil and specific plants establishes a cleaning process, but also it creates specific habitats. The idea is to choose an area inside the industrial site and realize, first, an irrigation system to collect rain water and testing it with phytoremediation (*Machrophyte*).

Then, to cultivate on the soil other plants with strong absorbing capacity (*Brassicaceae*, *Linum usitatissimum*, *Miscanthus*, *Helianthus annuus*). Cultivating is intended as a «taking care» action and it concerns also working with time. The reactions of the soil to this kind of treatment implies changes in landscape. So we don't know exactly what will be the soil answer, we can only imagine scenarios, as like *mosaic* (fully cultivated), *sponge* (partially cultivated), *leopard spots* (scarcely cultivated). Testing phytoremediation and other experimental reclaim methods could be an interesting research field, because the region contains many industrial abandoned sites for the development of in situ researches on this specific subject. The choice of less invasive methods reflects the intention to work with materials and elements of the site, giving them new meanings and therefore to preserve what nature has built by itself, to respect and to reveal to people the slow rhythm of changing.

Finally, the **introduction of new uses** is intended to employ rural elements and dynamics in order to re-constitute a new productive landscape, balancing environmental quality, natural aesthetics and social engagement. The reuse of abandoned areas concerns also the re-writing of parts of towns, linked to urban functions. The landscape design approach permits to consider vegetal materials and their temporal dynamics as basis in local development strategies, where ecology becomes a new urban form of identity. The proposal is to reuse the area as a public space, where design process let citizens re-appropriate of places through a physical and mental attitude. Vegetal structures are used as compositional elements of the places and as the expressions of landscape transformation. The experiences of a ploughed ground, of the growing of crops, of the harvesting, are re-introduced through the landscape design, where the functional and the aesthetic values are combined in the regeneration process. Rural practices, evoking seasonality, are re-interpreted as cultural acts, tending to reconcile man with his territory and with the rhythm of nature.

CONCLUSIONS: EVOLVING CULTURE INVOLVING NATURE

The research challenge is to introduce green structures in abandoned areas, in order to develop a new dynamics, where design process works as an experimental device, according to an eco-logic perspective. In addition to environmental restoration, the discovery and the perception of nature in brownfields, permit to reconstitute a consciousness in citizens' memory and to create a new imaginary, building the bases for a gradual re-appropriation of those forgotten territories. Following the described theories and case study, it appears that ecology offers a real opportunity to review instruments and methods in regeneration strategies. But ecology is not a panacea itself: the risks in ecosystem service approach are several, if design imposes nature as a disconnected layer from the site. First, especially in public spaces design, there is the risk of confusing the primary values of the action of planting trees and greenery: some aesthetical choices could not represent the ecological efficiency. This happens very often when an immediate effect is required, where vegetation's use is equated to a decorative device, instead of a new balance generator one. Similarly, choices based on low maintenance perspective are not always synonymous of ecology but respond to economic saving or reflect a lacking comprehension of the qualities of the site. Furthermore, in Urban Planning, prescriptions about greenery and trees plantation follow some quantitative parameters instead of qualitative ones, ignoring perception as a fundamental factor in landscape design. In fact the sensory dimension expresses the relationship between man and the place and it can strengthen or weaken the efficacy of a project. The contribution of landscape design to Urbanism is based on a multidisciplinary approach which tends to detect and enhance those hidden and overwritten features characterising the genius loci of the places. Thence, ecology represents a remedy in regenerative strategies, as it enriches the design approach by unveiling site specific factors, and by integrating in landscape urbanism a deep knowledge of the processes and their effects on environment and on society.

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