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Regeneration of the Built Environment from a Circular Economy Perspective

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The Technological Project for the Enhancement of Rural Heritage



Elena Mussinelli, Raffaella Riva, Roberto Bolici, Andrea Tartaglia,
Davide Cerati and Giovanni Castaldo

Abstract Based on the results of three research experiences in rural contexts, this paper proposes an integrated and multidisciplinary approach to the themes of the peri-urban landscape project, the enhancement of architectural heritage and the economic and social value of agriculture in land management. Starting from the potential and criticalities identifiable in peri-urban and rural contexts and recognized by the scientific literature, the selected experiences define a theoretical and operational framework based on a technological project approach aimed at integrating the ecological-environmental, landscape-fruitive, economic-productive and socio-inclusive values with the objective of enhancing the rural heritage.

Keywords Rural heritage · Peri-urban territories · Landscape enhancement · Fruition · Environmental design

1 Potentialities and Criticalities of Peri-Urban and Rural Territories

In order to fully understand the meaning of sustainable development, it is necessary to frame the issue within a broader and more articulated context. Indeed, it is not sufficient to refer to the scale of green building, but we must widen our focus to the scale of the green city and moreover to that of the green economy, in line with the objectives of the 2030 UN Agenda for sustainable development, the *Strategia Nazionale per lo Sviluppo Sostenibile* and the proposals of the Sustainable Development Foundation and of the Green City Network.

The economic model of the green economy is based on the protection of natural capital, the improvement of the ecological quality of the urban systems, the increase of cultural capital, the enhancement of technological capital and the safeguard of social capital (work group policy of the architecture for the green economy in the

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cities 2017). A marked tendency towards an “ecological conversion” derives from this, where a key role is assumed by the management of non-urban anthropized landscapes, mainly consisting of rural and peri-urban territories, which constitute the natural capital to insert an effective green infrastructure of the territory, while at the same time offering the cities a mix of ecosystem and social-cultural services.

Since these transition areas between anthropized and natural spaces are currently under strong transformative pressure, in the metropolitan sprawl, the characteristics of the urban and of the rural have basically merged, making up a diffused and polycentric landscape which led to the formulation of the concepts of “urban-rural agricultural eco-system” (Council for Agricultural Science and Technology 2002) and “urban bioregion” (Magnaghi and Fanfani 2010). These areas are a strategic resource for the regeneration of the built environment, due to the fact they can play a primary role for the creation of regional and super-local ecological networks. However, a number of specific critical issues remain to which the project must respond: in these territories, relevant effects of ecological and environmental degradation are particularly relevant, due to soil consumption from urban expansion as well as the construction of new infrastructures, while also deriving from a crisis in the agriculture sector, characterized by small-sized companies not being able to face the general reduction in EU subsidies and the competition of the global market. Thus, the peri-urban rural areas are fragile contexts, where the value of agricultural productivity is always less than the income derivable from urbanization. The real risk is that of further erosion processes, with a drastic reduction in environmental, ecological and productive values, in addition to the degradation of the landscape and of cultural heritage and to the consequent crumbling of the social structures typical of rural communities.

European policies have recognized the structural role of these contexts, promoting a development of a “suburban agriculture” characterized by multi-sectorial design and by the integration of economic-productive values, environmental and landscape peculiarities and social-cultural identities (Mussinelli and Cerati 2017).

These issues traditionally belong to the culture of environmental design, and they characterize the activities of the research group “Governance, design and enhancement of the built environment” of the ABC Department-*Politecnico di Milano*, previously coordinated by Fabrizio Schiaffonati and today by Elena Mussinelli. Relevant and remarkable experimentations regarded, for instance, the integrated planning of the *Parco Naturale della Valle del Ticino piemontese*, with actions for the management of its environmental and landscape resources and for the territorial development of the pre-park areas, as well as experiences of territorial marketing plans in the Mantua Moraine area in the Oltrepò area, from which also derived initiatives for the establishment of cultural districts and for the promotion of territories through ecomuseums.¹ More recently the research group carried out a more in-depth study of the issue of enhancing rural heritage, specifically in the contexts of the Oglio Po area, of the peri-urban area of Mantua and of the metropolitan area of Milan.

¹For further information, see Schiaffonati et al. 2015.

2 The Project for the Landscape Fruition of the Oglio Po

Significant on a territorial scale is the experience developed with the LAG *Terre d'Acqua Oglio Po* within the framework of the inter-territorial and transnational cooperation project LANDsARE “Landscape Architectures in European Rural Areas: a new approach to local development design”,² for the identification and promotion of innovative modalities for the fruition of rural heritage and for adding both economic value, as a lever of attractiveness for tourist flows, and social value, by reconnecting elements of the territory’s identity.

The territory of Oglio Po is a context with a prevalent agricultural vocation, located between the provinces of Cremona and Mantua, characterized by the presence of noteworthy environmental, landscape and historical-cultural peculiarities, as well as by a diffused fabric consisting of rural buildings only partially still working and productive. The SWOT analysis conducted for the characterization of this context outlined, on the one hand, the excellence of the heritage and, on the other hand, the need to define a strategy of integrating the enhancement of this heritage, not adequately used and in some cases entirely neglected, as a basic condition for the economic development and for the tourism-focused promotion of the area.

The first phase of the project is focused on landscape heritage through the establishment of a database for the classification of historical and architectural heritage with its relationships with the system of environmental resources, a catalogue of the collected information, a selection of character-defining elements on which to develop emblematic actions of rural heritage enhancement, a survey of the conditions of degradation of the selected heritage and thus the identification of intervention priorities. The second phase, presenting an experimental nature, consisted in the organization of the design workshop “Land-LAB” and of the “Call for ideas for the restoration and enhancement of rural heritage of the LAG Oglio Po territory”, aimed at collecting design proposals for the implementation of tourist fruition ideas for the area. Eventually, the third phase launched actions of dissemination and the presentation of the achieved results, through traditional channels (exhibition, catalogue, public presentation) as well as innovative solutions (digital devices and the cohesion platform).

²“Realization of a survey for the knowledge of the landscape heritage of the area of the Oglio Po and its conditions of degradation” (2013), LANDsARE Project—Measure 421 “Inter-territorial and transnational cooperation” of the PSR 2007–2013 of the Lombardy Region—FEASR. Project of transnational cooperation “LANDsARE”, research contract between Territorial Pole of Mantua of the *Politecnico di Milano* and LAG *Terre d'Acqua Oglio Po*, scientific responsible R. Bolici, operative coordinators G. Leali and S. Mirandola, work group E. Mussinelli, F. Schiaffonati, A. Poltronieri, D. Fanzini, M. Gambaro, A. Tartaglia, R. Riva, G. Castaldo, C. Giordano, L. Mora, R. Scalari. The outcomes are published in: Bolici 2015; Mussinelli et al. 2015; Fanzini et al. 2019.

3 The Enhancement Project of the *Corti Bonoris* in Mantua

In the context of the UNESCO city of Mantua and with reference to the peri-urban scale, the project of rural heritage enhancement for the *Corti Bonoris* in the Mincio Natural Park is emblematic.³ This is an agricultural area of 600 ha, located between Mantua and Porto Mantovano, owned by the *Fondazione Conte Gaetano Bonoris*, a non-profit institution operating in favour of minors suffering from disabilities. The area is of extraordinary environmental, landscape and production interest, between the Bosco Fontana State Natural Park and the northern shore of the Superior Lake of the city of Mantua, one of its kinds in terms of dimension, undivided property and strategic location. It includes ten rural courts dating back in some cases to the mid-eighteenth century, partly in a state of abandonment or underuse.

In this case, the project faced, on the one hand, the high level of protection due to the exceptional environmental and landscape heritage and, on the other hand, the need to enhance its rural heritage, both in terms of increasing rent, with technological adaptation interventions for the management of agricultural funds and livestock, and through opening up to tourism and the non-profit sector, within which the Foundation operates. An enhancement cannot be postponed, due to the consequent condition of abandonment and the loss of a huge cultural and landscape heritage, the maintenance costs of which become sustainable only if they are framed within a more comprehensive intervention of modernization, innovation and qualification of agricultural production, including new functions capable of producing income at the same time. The project involved the activation of a process of participation with the engagement of different public and private actors, stakeholders and institutions of the third sector—first of all the Foundation and its tenants, the *Parco del Mincio*, the *Sovrintendenza*, the *Caritas Ambrosiana*, the *Provincia di Mantova* and citizens—also through the organization of a series of design workshops. The outcome of this process has led to the definition of a general master plan, of guidelines for thematic sub-areas and to the development of pilot projects.

The investigation conducted through site surveys, analysis of plans and program documents, meeting with stakeholders and questionnaires, allowed researchers to identify the polarities of the territory, outlining the relationships between themselves, the criticalities, the potential, the constraints and the tendencies of the local system development. Starting from this fact-finding basis, the project aimed at strengthening the connections between the city, rural areas and protected areas, through the provision of a system of ecological corridors, a network of slow mobility paths, equipped areas as well as providing courts with new agricultural, social, tourist, educational

³“Studies for the rehabilitation and the use, environmental and landscape enhancement of the heritage of the *Fondazione Bonoris*, in territorial context of the Mincio Natural Park” (2012–14), research contract between Department of Built Environment Science and Technologies BEST *Politecnico di Milano* and the *Fondazione Conte Gaetano Bonoris*, scientific coordinator E. Mussinelli, coordinator R. Riva, work group C. Agosti, R. Bolici, D. Fanzini, A. Poltronieri, collaborators A. Bezzecchi, A. Chirico, C. Giordano, R. Scalari, advisors B. Agosti (*Parco del Mincio*), M. Castelli (*Provincia di Mantova*), A. G. Mazzeri (*Sovrintendenza*). The outcomes are published in: Mussinelli 2014a, b; Agosti and Riva 2014; Schiaffonati et al. 2015; Mussinelli et al. 2015.

and cultural functions. A mapping of the interventions of functional updating of the courts has been conducted, with the identification of disused buildings for the proposal of regeneration projects, realizable also in different steps in accordance with the financing opportunities and the interest of investors, fostering a true flexibility for these transformations. The synthetic framework of these interventions depicts the master plan of the project. The second step of analysis concerned the development of guidelines for landscape redevelopment, accessibility and usability, the diversification of the tourism offer and energy requalification. Finally, the third level has developed two pilot projects for the enhancement of the *Corte San Giovanni Bono*, now fallen into disuse, under the “Gate of Mantua” project, with the realization of an agri-camping and tourist accommodation services. Furthermore, the enhancement of the area made up of *Corte Canfurlone* and *Corte Ca’ Bianca*, under the “Gate of the environmental system” project, with accommodation and restaurant activities integrated with collective services, such as an agri-nursery school, museum spaces and a centre for environmental education managed by *Bosco Fontana* and *Parco del Mincio*, as well as a bike-sharing station with a cycle workshop under the Roundabike association management.

For the *Fondazione Bonoris* and the *Parco del Mincio*, the project constitutes a replicable model of intervention in other rural contexts within the Park, thus proposing itself as a good project practice for the peri-urban landscape, triggering economic regeneration processes and promoting greater social cohesion.

4 The Project of Strategic Development of the Peri-urban Rural Heritage of the *Ospedale Maggiore* in Milan

The strategic plan FILARETEAM (For Innovation of Landscape and Agriculture: Renewable Energy, Territorial Economy and Amelioration Management) was developed in the Milan metropolitan peri-urban context, in collaboration with the *Fondazione IRCCS Ca’ Granda* and the *Fondazione Sviluppo Ca’ Granda*, respectively, as owner and as manager of the rural assets of the *Ospedale Maggiore* in Milan.⁴ The overall rural heritage consists of about 200 agricultural farmsteads (8500 ha) concentrated for the 60% in the metropolitan area of Milan. As for the *Corti Bonoris*, in this case, we are also facing a vast rural heritage, of great historical and cultural importance and with undivided property. Cross-checking the internal policies of the *Fondazione Sviluppo Ca’ Granda* and those of municipal and metropolitan programming, the strategic plan has identified four macro-areas of action, on which to conduct

⁴The strategic plan FILARETEAM is the first result of the “Framework agreement for the research and the education between *Politecnico di Milano* and *Fondazione Sviluppo Ca’ Granda*” (2015–21), with the financing of one Scholarship for the 31st Doctoral “Environmental design and resilient approaches for the redevelopment of landscape heritage in metropolitan peri-urban and rural areas”, supervisors E. Mussinelli, A. Tartaglia, Ph.D. student D. Cerati. The outcomes are published in: Malcevschi et al. 2017; Mussinelli and Cerati 2017; Tartaglia and Cerati 2018; Fanzini et al. 2019.

specific in-depth studies, pre-feasibility studies and actions aimed at acquiring financing. The macro-areas are: the creation of new agro-productive models; the activation of a food quality brand through sustainable processes involving short supply chains; the enhancement of heritage for tourism and cultural use; the experimentation of housing and social work models in the agricultural area.

The first phase of experimentation concerned the rural heritage of the Abbiatense area, south of the metropolitan area, which represents a strategic context, representative of the strong historical-cultural link with the city of Milan. The analysis of the territory, of the infrastructural connections, of the existing and planned productive and commercial activities, of the historical agricultural system and of the environmental aspects, has provided the knowledge base on which to structure a smart specialization strategy called “Agro-Active Landscape”. The strategy identifies two lines of action and then declined into pilot projects. The first line of action, “Agriculture-woods-energy” (AWE), is aimed at implementing the arboreal heritage along the Bereguardo Canal and near the Ticino River, in order to produce environmental results both in terms of CO₂ capture to compensate for greenhouse gas emission from the urban heritage of the Foundation and in terms of absorption of nitrates present in the agricultural subsoil, in view of an eco-environmental balance between the city and the suburban rural area. The second line of action, “Channels-connections-production” (CCP), focuses on the redevelopment of the Bereguardo Canal, of the connected basins and of the hydraulic artefacts, with the aim of allowing its navigability in a productive, tourist-oriented key, also representing itself as a hydraulic mitigation intervention during extraordinary events. Both lines of action provide for an active involvement of farmers and stakeholders, called on to implement good practices for the production of quality goods and the provision of an ecosystem and multifunctional services for the territory.

5 A Methodology for the Enhancement of Rural Heritage

The experiences described show how an increase in multi-functionality and an enhancement of ecosystem services and the benefits of rural heritage represent possible levers for actions to regenerate a built environment, verified in their feasibility and sustainability even with respect to the increase in the resilience of urban areas and suburbs. *“The concept of multi-functionality, which is inherent to resilience, well interprets the need to improve a territory’s environmental effectiveness, meanwhile increasing the level of awareness of the local social system. The putting into effect of resilience strategies is, in this sense, a particularly functional tool for the redevelopment of suburban rural territories in which the critical points grow in the environmental, cultural, social and economic aspects”* (Mussinelli and Cerati 2017:252).

The presented cases allow us to derive a replicable methodology that sees as the first fundamental step, the systemization, formalization and management of knowledge and information on the territorial context, aimed at highlighting critical issues

and the potential of the considered areas. Starting from this formalization, it is therefore possible to activate cooperation and active participation processes involving local institutions, stakeholders, economic operators and local communities, to gather ideas, needs and willingness to participate in the implementation of the interventions. This type of process is not immediate, especially in contexts that express a lack of dialogue and the search for a balance between different interests, but it can find supports through the dissemination of best practices and the direct comparison with “virtuous” local systems (Riva 2017). Therefore, the results of the participation process can be translated into a strategic plan for the enhancement of the rural heritage that expresses an integrated and organic vision in the broad territorial context, structured through the sharing of lines of action and pilot projects, selected on the basis of the significance of the interventions, on their replicability and on the financing opportunities that can be activated. The more the projects will be able to balance and integrate the ecological-environmental, landscape-fruitive, economic-productive and socio-inclusive values, the higher will be the possibility of triggering long-lasting processes of enhancement of rural heritage, with positive effects for the urban environment as well.

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