

A Research Model for Farm Building Design: General Structure and Physiognomic Characterization Phase

P. Tassinari¹, D. Torreggiani¹, S. Benni¹, E. Dall'Ara¹

¹ University of Bologna, Dept. of Agricultural Economics and Engineering,
Spatial Engineering Division, v. le G. Fanin 48, 40127 Bologna, Italy.
patrizia.tassinari@unibo.it

ABSTRACT

The design of contemporary farm buildings often subordinates architectural quality and aesthetic features to economic aspects, thus leading to poor landscape consistency and compatibility. The research presented in this paper is based on the theoretical principle that historic rural buildings, being expression of an accumulation of empirical knowledge broadly associated with high architectural quality, have remarkable potentials to contribute with useful elements to the design of contemporary buildings, and on the awareness that the design process is also necessarily and substantially determined by technological, economic and functional variables. The paper presents the FarmBuiLD model (Farm Building Landscape Design), a *research model* proposed by the authors as a tool for the analysis of the architectural characters of both historical and contemporary rural buildings, as well as the *meta-design* of new construction and transformation of contemporary rural buildings. In particular, the work focuses on the general structure of this model and a synthesis of the main results of the critical analysis of the scientific literature aimed at identifying a set of synthetic architectural parameters suitable for its implementation, through the interpretation of the main physiognomical characters of rural buildings. These parameters are not meant as a tool to obtain quantitative data to be translated into design constraints automatically; on the contrary, they are mainly considered as an interpretive-analytical tool, part of a broader knowledge framework aimed at supporting, stimulating and suggesting the design choices.

Keywords: Rural building design, historical-typological consistency, landscape compatibility, architectural quality, analytical and meta-design criteria, Italian rural building heritage

1. INTRODUCTION

The recognition of the landscape values of the rural space, the importance of protecting them and the need for renewed and innovative planning of the countryside are issues of great relevance in the most recent land-use management and planning policies. This is in also line with the principles of the European Landscape Convention (Firenze, 2000), which emphasizes the importance of those landscapes that might be considered outstanding as well as everyday or degraded landscapes, thus laying the foundations for the development of regulations aimed at an overall protection and enhancement of the European landscapes. These actions should start from the most common and widespread transformations that almost everyday involve the settlement system, a fundamental tessera of the landscape mosaic. The architectural quality of the built environment is an essential element of landscape quality; thus, it should be a primary concern whereas the aim is a more general enhancement of the landscape. With particular reference to the

countryside, this architectural quality seems more and more compromised due to the deep changes driven by the industrialization processes. As a consequence, the issue of architectural quality is increasingly coming to the fore, since it represents an essential prerequisite for the landscape enhancement and socio-economic development of rural areas (Di Fazio, 1989; Ruda, 1998; Tassinari, 2008; Tassinari *et al.*, 2009).

The design of the rural built environment was historically bound up with the research of rationality, since it had to combine multiple functions while dealing with resource shortage. The so called "rural functionalism" (Callioni, 2005) has thus resulted in building models that can be considered sustainable *ante litteram*, and whose *widespread, veiled and implicit aesthetic value* is now recognized (Venturi Ferriolo, 2002). Turri (1998) emphasizes the perceptive value of rural landscapes getting to the point of assuming them to be like *sceneries*, built up by farmers aware of the spectacular effects of their work.

On the contrary, the design of contemporary farm buildings often subordinates architectural quality and aesthetic features to economic aspects, thus leading to poor landscape consistency and compatibility. It is generally known that one of the most important problems is the confusion of architectural languages, at both landscape and building scales. More in detail, the forms, techniques and materials currently used deeply differ from the traditional ones (Ruda, 1998; Tassinari, 2008). In itself, this phenomenon does not necessarily have a negative meaning, since it represents a physiological development related to the radical socio-economic and technological changes driven by the industrialization process of the building industry and agriculture, become considerably more marked after the sixties. The layout, size, and technological features of traditional buildings did not meet any more the new functional needs caused by the modifications of agricultural productive processes and farm management. At the same time, the high versatility of industrial components of buildings allowed to create new architectonic solutions, meeting these new requirements, but generally inconsistent with the historical architectonic heritage.

Actually, the main critical issue is that forms and technologies differing from the ones typical of local traditions are often used with no architectural innovation ability, nor do designers always have a proper concern about the consequences of their actions in terms of loss of aesthetic values and - in a broader sense - landscape identity of the countryside. As for the reuse and new construction of rural buildings for residential functions, tourist accommodation, and recreational, educational and cultural activities, styles are often merely borrowed from urban contexts, or marked by an abstract and false idea of *rurality*, with no sound historical and geographical contextualization. Moreover, as for the design of buildings for agricultural and livestock productions and food processing, the frequent use of generic prefabricated structures is often caused by the absence of *ad hoc* architectural projects.

Rural landscape is still subject to the "worst forms of historicist eclecticism and cultural malpractice": La Regina (1980) describes this process as a consequence of the Twentieth-century avant-garde artists focusing on a "mythicized" idea of the urban life and context.

With a few exceptions, design skills capable of inventing new contemporary images of high aesthetic quality and establishing a dialectical relation with the historical heritage elements of the countryside can be rarely found out. The design practice often lacks a sound consideration about the opportunity and possibility of designing consistently - or, on the contrary, consciously breaking - with the historical forms of rural architecture (at the building scale) and landscape (at the geographical scale).

Nowadays, rural buildings have lost their above-mentioned original peculiarity of appropriately blending into the landscape (Di Fazio, 1989) and consisting in simple shapes, balancing characters of uniformity, repetitiveness and originality (Tassinari *et al.*, 2009). The planner, whose intentionality drives architectonic design, has a higher degree of decision freedom, made possible by the available technologies and stimulated by the huge variety of existing models. Codified reading methodologies of traditional building typologies allow not only the scholars to define essential design references, but also any designer to form his own *critical consciousness* (Caniggia and Maffei, 1979) and enrich his analysis and synthesis skills in the design process.

This study is part of a broader research whose general goal is to identify design criteria aimed at fulfilling the need for a new aesthetic quality of constructions in rural areas, with particular attention to the architectural quality and landscape compatibility of new farm buildings. This paper presents the FarmBuiLD model (Farm Building Landscape Design) a *research model* the authors propose as a tool for the analysis of the architectural characters of both historical and contemporary rural buildings, as well as the *meta-design* of new construction and transformation (restoration, extension, reuse, ...) of contemporary rural buildings. In particular, the work focuses on the general structure of this model and the results of the critical analysis of the scientific literature aimed at identifying parametric instruments suitable for its implementation. For brevity's sake, we will not report either the further stages of model validation and calibration or the detailed definition of the parameters here, also for what concerns the aspects of their suitability to connote the contemporary building as well as the traditional ones and to grasp the various characters of local architectures, whilst they will be the subject of future works.

2. MATERIAL AND METHODS

The research was based on the theoretical principle that historic rural buildings are expression of an accumulation of empirical knowledge broadly associated with high architectural quality (Pagano and Daniel 1936; Turri, 1998; Venturi Ferriolo, 2002), as it was mentioned above in the introduction, thus having remarkable potentials to contribute with useful elements to the design of contemporary buildings.

Such potentials can also be expressed through specific design criteria based on historical-typological consistency (Caniggia, 1963, 1976; Caniggia and Maffei, 1979; Cataldi, 1975, 1977; Chiappi and Villa, 1980). The following awareness represented another basic principle of the study: the design process is also necessarily and substantially determined by technological, economic and functional variables. These variables have changed so deeply since World War II that we had to focus on the question if historical consistency is always possible, to what extent and by what methods. The strong discontinuity with the past, for what concerns functional and dimensional issues, calls for the evaluation of different gradients of historical and typological consistency, including the case where a typological discontinuity is needed or unavoidable.

The principle of historical-typological consistency is broadly considered in more recent spatial planning regulations, for what concerns its application within the themes of restoration and reuse of historic rural buildings. In this study, the crux of the matter regarding the above-mentioned possibility to extend the application of this principle to the theme of new construction is examined thoroughly by giving a broad meaning to the characters of openness, evolution and dynamism inherent in the definition of *type* (from which the definition of typology is derived), proposed by Quatremère de Quincy (1785-1849) and reintroduced by several scholars such as

Argan (1965) and Rossi (1966). Quoting Rossi (1966), “the type is [...] invariable and necessary; such characters are crucial, nevertheless they interact dialectically with the technology, function, style, collective nature and individual time expression of each architectural event”.

Moreover, reinterpreting the considerations by Caniggia and Maffei (1979) about the role of that form of devising they define as a *critical consciousness* in the production of the architectural type, the study focuses on the research and proposal of typological characters, since this can be considered particularly appropriate given the *crisis* contemporary rural architecture is going through, for what concerns its aesthetic and landscape quality.

3. RESULTS AND DISCUSSION

The following paragraphs present the general structure of the FarmBuiLD research model and a synthesis of the results of the in-depth studies aimed at identifying the main physiognomical characters of rural buildings. These analyses will support the definition of a set of synthetic architectural parameters, which represent fundamental basic tools for the application of the proposed method.

3.1 The Structure of the FarmBuiLD Model

The FarmBuiLD model - whose goal is to identify *historical-typological consistency* criteria for rural building design (HTC) - considers several interconnected analytic and interpretative phases, organized into groups representing the main modules of the model (Figure 1).

The modules of *physiognomical characterization* (P) and *functional characterization* (F) of rural buildings aim at providing the in-depth analyses focusing on a *case study* (CS) with fundamental analysis tools; moreover, they directly contribute to the above-mentioned goal, by means of their more general value. The diagram of Figure 1, though it lays no claims to being exhaustive, outlines the main phases of the FarmBuiLD model and their mutual relations, thus simplifying the comprehension of such a wide and intricate pattern.

The goal of the module of *physiognomical characterization* (P) is to identify a set of synthetic architectural *parameters* aimed at representing analytical and meta-design tools dealing with the morphological aspects of rural buildings. The preliminary identification of these parameters follows from the definition of the essential physiognomical characters, which is based on the critical analysis of the international scientific literature. Moreover, further in-depth analyses carried out on specific case studies are aimed at improving and refining the definition of the parameters.

The *functional characterization* (F) module is aimed at analysing the functional needs of contemporary farm buildings through a sound review of the technical-scientific literature.

The results of the research modules *P* and *F* form an essential knowledge framework useful to propose design criteria based on historical and typological consistency.

The module which provides for the in-depth analyses carried out on a *case study* (CS) is aimed at analysing the local peculiarities of the various geographic areas where the model can be applied, since this is a fundamental step to define historical and typological consistency criteria based on a sound comprehension of the specificities of local architectures and functional needs, which may also vary within small areas.

It is well known that the geographical location crucially influences the process of constitution and evolution of the rural building typologies, as it has been documented by several scholars like

Gambi (1977), Caniggia and Maffei (1979), and Gaiani (1997). The typological differentiation thus reflects the variety of the landscape contexts. Among the main local factors affecting such typological process we can mention the availability of local building materials, the environmental characters, such as regional climatic conditions and topography, and the spatial diversification of the productive structure and organization of agriculture. Thus, the analysis of the case study module (CS) assumes a central role in the proposed model. It consists of two phases: the typological analysis (TA) and the analysis of needs and performances (PA). They are carried out jointly in consideration of the close relation between the form issues and the functional needs. The TA phase is performed, by means of the same tools and methodologies, both on samples of historic and contemporary buildings, in order to achieve a qualitative and quantitative overview of their architectural features. The comparison of these characters allows to find out the elements of typological continuity and discontinuity. The PA phase is performed on a sample of contemporary buildings to find out their functional characters and possible criticalities or inadequate elements. Phases PA and TA aim at analysing the reasons and issues driving contemporary rural buildings to break with traditional architectural forms. Phases PA and TA also aim at checking if these characters of typological discontinuity actually result from functional discontinuities which necessarily do not allow historical-typological consistency to be achieved, or, in cases where historical continuity may be achieved through a sound design process, to what extent and about what formal aspects this is possible.

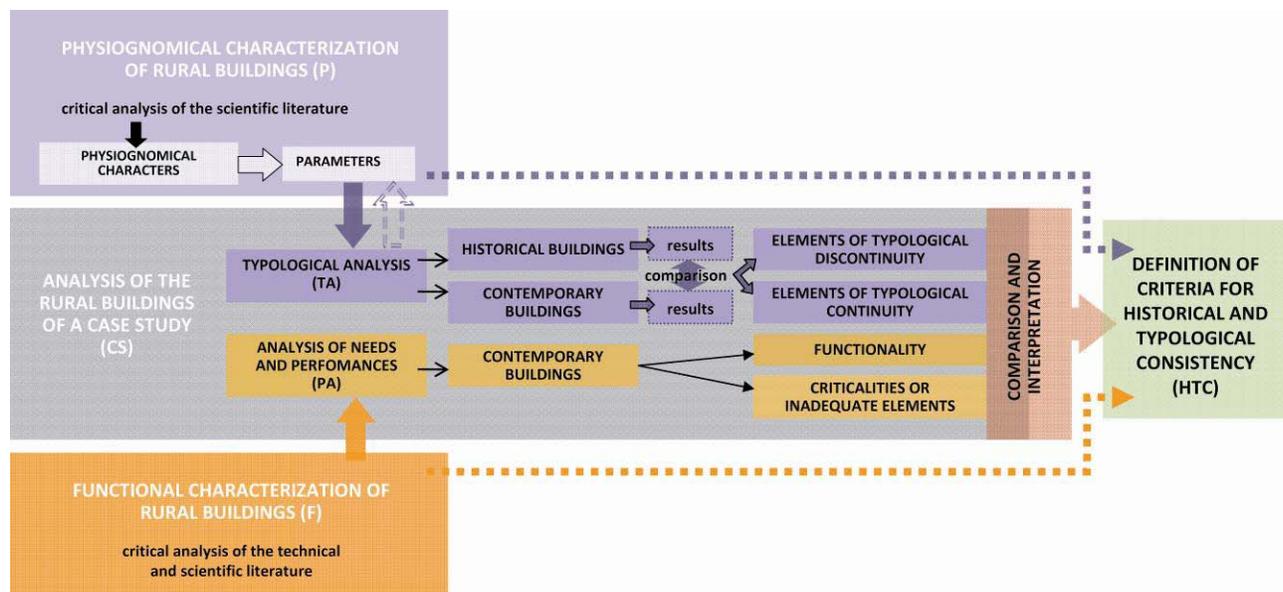


Figure 1: The structure of the analytical and meta-design FarmBuiLD research model.

3.2 Physiognomic Characters of Rural Architecture

The study aimed at the identification of the physiognomical characters (P) was based on a detailed critical analysis of the state of art, whose main results are briefly discussed below. Several authors studied the typological classification of Italian historic rural buildings (Biasutti, 1938; Ortolani, 1953; Gambi 1950, 1977; Gaiani, 1997), mainly considering how their rooms with different functions were spatially combined. Nevertheless, these authors were aware that the

functional organization alone is not adequate to describe the physiognomy of rural buildings, that is to say their external appearance within the landscape scenery and the semiotic connotation they impress on the landscape through their volumetric configuration and location in relation to the system of signs of the landscape mosaic: besides, the aspects related to the *forms*, *materials* and *colours* always play a central role. Quoting Ortolani, “.. the external shape, the roof and the building materials are important for the systematic classification since the same structure was often expressed through different types”. Moreover, the stairs, openings (in particular their size, proportions, location and composition), porticos and dovecotes, when present, also represent essential elements which contribute to defining the shape of rural architecture.

Frangi (1987) describes the roof, where “inveterate wisdom concentrates the best building knowledge”, as the part of the building which plays a central role in “giving shape to the whole house”. The following example is evidence that each functional organization can not be associated with a single form. The juxtaposition of *dwelling*, *cattleshed* and *hayloft*, and *portico* (the *dwelling and farm building* juxtaposed type identified by Ortolani, 1953, can be mentioned) was expressed through articulated forms where such parts are aggregated in the overall building, still each of them can be read as an individual part. On the contrary, the same juxtaposed-functions building was sometimes turned into a compact volume, whose various internal functions can be read from the outside mainly considering the distribution and size of the openings.

In the last decades, several international authors have been focusing on the contemporary relation between rural architecture and landscape, aiming at developing design criteria to make new constructions appropriately blend into the landscape. They too emphasize the importance of volumetric *form*, *materials* and *colours*, as well as the role of the *texture* of architectonic surfaces in visual perception (Ayuga *et al.*, 2004; Mennella, 1996; Heinrich and Kaufmann, 2005). Di Fazio (1989), referring to some on-field surveys and in particular to the results of a systematic research carried out in eastern Sicily, describes the main factors influencing the appearance of agricultural buildings. A proper *siting* with reference to natural landform and the organization of the space surrounding the building which links it to the surrounding landscape are mentioned above the main aspects, together with those at the building scale such as *shape and form*, *volume distribution*, *materials*, *colours*, and *textures*. Other authors focus on the study of visual perception of landscape and visual impact of its transformations. They identify some *visual elements* of landscape and its components (such as the historical and contemporary buildings): *colour*, *texture*, *form* and *strength lines* and others related to compositional issues, such as *scale* and *spatial character* (Smardon, 1979, Smardon *et al.*, 1986, Garcia *et al.*, 2003, 2006; Ayuga *et al.*, 2004).

Several scholars who studied the theories of the *Gestalt* psychology demonstrated how the perception of each object is determined by the *shape*, *form*, *space*, *light*, *colour* and *dynamics*; we consider these categories, among those which have influence on visual perception defined by Arnheim (1974), the most important for what concerns the goal and subject of this study.

The results of the analysis of the state of the art outlined above supported the identification of a possible frame of the essential physiognomical characters of rural buildings. These characters mean the objective architectural features of the building and connote its visual appearance, as perceived also based on the landform of the surrounding landscape. Moreover their structural and functional meanings as landscape signs prove important for the semiotic characters of the

landscape mosaic. For simplicity's and rationality's sake, we classify these physiognomical characters into various categories, given the design-oriented subject of our study. Nevertheless, of course such classification does not account for the several and intricate relations which all together contribute significantly to the perception of the formal aspects of the building.

The physiognomical characters can be expressed through a set of quantitative and qualitative elements, that have to be considered jointly to carry out a comprehensive architectural analysis.

In relation to the specific objectives of the study and for brevity's sake, we will discuss here only the main aspects regarding the *form*, which proved to be of general and priority importance within the overall balance of the architectural evaluations.

The first feature considered was the *compactness/articulation of the volume*, depending both on the number of building bodies distinguishable from the outside which make up the building, and the way they are combined.

Moreover, also the *horizontal/verticality* feature proved to be of primary importance in defining the general composition of volume. This feature, to be assessed mainly with reference to the prevailing dimension of the building¹, is perceived depending not only on the size attributes of the building, but also on the symmetry or lack of symmetry of its front, and on the shape and distribution of the openings in its outside walls (Arnheim, 1977), as well as on finishing elements that create *strength lines* (such as cornices and string-courses).

Other aspects that define the composition of volume are both the quantity ratio and formal composition of *enclosed and open portions of the volume*. They can make the building appear compact, solid and closed, or vice versa transparent, "light", open, almost poised in the air within the surrounding landscape; moreover, they can lend the building an articulated association of both these characters.

Another essential physiognomical feature of the form is the *figure-ground* ratio, created by the *openness/closure of perimeter surfaces*. This ratio is considered very important in the field of art (Arnheim, 1974, 1977), since it crucially affects the perception of figures within the surrounding space. Moreover, it is used in urban planning and landscape analysis to map the relations between built-up areas and open spaces, since this allows the forms of the fabric of urban areas and countryside to be easily read. This aspect is useful not only for the architectural characterization of the single building, but also for a broader research aiming at analysing the surrounding landscape, through interpreting the relations between the buildings and their "backgrounds" within the landscape scene.

It is worth underlining how the perception of the *form* depends, besides the size and composition features of the volume discussed above, also on the already mentioned aspects of *material, colour* and *texture* of the external surfaces². With reference to the traditional rural architecture,

¹ The perceptual impact of the horizontal/verticality feature is also discussed by Gambi (1977). While describing the rural building typologies of the Emilia-Romagna Region he frequently refers about vertical and horizontal elements and their mutual relations. His eloquent words clearly describe such aspects: "The houses of our Apennines appear with different shapes depending on the point of view we observe them from. If you look at them from below they appear to have a **towering** outline, that is to say a mainly **vertical development**; on the contrary, if you look at them from above they seem to be **flattened** against the ground with their shape clinging to the landform"; "... a considerable number of old buildings with their **towers rising** can also be found on the plain between Bologna and the area around Parma and Piacenza"; "... after the sixteenth century ... the vertical form is associated with horizontal delineations, whose units are arranged more suitably and mainly face each other or inscribe a space ... to form a court" [Bold type is introduced by the authors of this paper, in order to underline some key issues.]

² Arnheim (1974) points out that no form could be perceived without light and colour: "[...] all visual appearance owes its existence to brightness and color. The boundaries determining the shape of objects derive from the eyes'

these latter elements can be considered extremely meaningful, since they hold the memory of the historical moment and geographical context that determined them, based on the available materials and local construction technologies.

4. CONCLUSIONS

The model outlined proved suitable to define a typological framework useful to work out basic references for building design that can be modulated according to the various features of rural landscape. The importance of developing a research model aimed at proposing design criteria based on historical and typological consistency and the utility of searching parameters capable of expressing the essential architectural features of rural buildings, meant as analytical and meta-design tools, depends on the idea of extending the “critical formulation” based on the “a posteriori analysis” of the architectural type, also to the definition of an “a priori synthesis”, a “concept”. While historically buildings were constructed by people in whose mind the architectural type already existed as a “concept” (Caniggia and Maffei, 1979), nowadays, farmers and designers need to be supported by sound critical investigations specifically aimed at enhancing the landscape and its stratified signs.

Given the numeric nature of the parameters, which do not have any geometric, formal or stylistic characterization, they can be considered as capable of leaving an appropriate level of freedom within the design of solutions aimed at meeting both contemporary and future functional and aesthetic needs. At the same time, they allow for such design process to start with a careful consideration and interpretation of landscape values, which - in an open evolutionary process – became stratified and keep on layering. Within this theoretical and methodological approach, the parameters are thus not meant as a tool to obtain quantitative data to be automatically translated into design constraints; on the contrary, they are mainly considered as an interpretive-analytical tool, part of a broader knowledge framework aimed at supporting, stimulating and suggesting the design choices.

5. REFERENCES

Argan, G. C. 1965. *Progetto e destino*. Milano, Italy: Il Saggiatore.

Arnheim, R. 1974. *Art and visual perception: a psychology of the creative eye*. First Edition 1954. Berkeley, California: University of California Press.

Arnheim, R. 1977. *The dynamics of architectural form*, Berkeley, California: University of California Press.

capacity to distinguish between areas of different brightness and color.”. Di Fazio (1989) expresses the relationship between form, material, colour and texture; he defines the last feature as “the surface characteristic of a form”; explaining that “the shape and the bulk of the building are perceived in different ways depending on the materials , the colours and the textures which are used”. Mennella (1996) discusses the role of the relationship between the reflection of light on vertical surfaces and the regularity of the walls, in the perception of the building height.

P. Tassinari, D. Torreggiani, S. Benni, E. Dall’Ara. “A Research Model for Farm Building Design: General Structure and Physiognomic Characterization Phase”. *Agricultural Engineering International: the CIGR Ejournal*. Manuscript 1456. Vol. XII. March, 2010.

- Ayuga, F., A.I. García, L. García-Moruno and J. Hernández-Blanco. 2004. How to change new rural building elements to improve landscape integration. In *Proc. New Trends in Farm Buildings*, 2-6 May, 2004, 14. Evora, Portugal.
- Biasutti, R. 1938. *La casa rurale nella Toscana*. Bologna, Italy: Zanichelli.
- Callioni, P. M. 2005. L'uomo e il territorio nel paesaggio rurale italiano. *CNN Attività, rivista del Consiglio Nazionale del Notariato* 1: 10-16.
- Caniggia, G. 1963. *Lettura di una città: Como*. Roma, Italy: Centro studi di storia urbanistica.
- Caniggia, G. 1976. *Strutture dello spazio antropico*. Firenze, Italy: Uniedit.
- Caniggia, G. and G.L. Maffei. 1979. *Composizione architettonica e tipologia edilizia – I – Lettura dell'edilizia di base*. Venezia, Italy: Marsilio.
- Cataldi, G. 1975. Il territorio della Piana di Gioia Tauro. *Studi e Documenti di Architettura* 4: 13-175.
- Cataldi, G. 1977. *Per una scienza del territorio*. Firenze, Italy: Uniedit.
- Chiappi, C. and G. Villa. 1980. *Tipo/ Progetto/Composizione architettonica*. Firenze, Italy: Alinea.
- Council of Europe. 2000. *European Landscape Convention*. Firenze: Italy.
- Di Fazio, S. 1989. Designing agricultural buildings in relation to the landscape. In *Proc. of the 11th International Congress on Agricultural Engineering*, eds. V.A. Dodd and P.M. Grace, 1191-1198. Rotterdam, Netherlands: A.A. Balkema.
- Frangi, G. 1987. Le pietre che vivono. In *Civiltà rurale*, ed. P. Merisio, 9-16. Milano, Italy: Silvana Editoriale.
- Gaiani, A. 1997. I tipi dell'abitazione rurale. In *Le case della grande pianura*, ed. M. Zaffagnini, 169-233. Firenze, Italy: Alinea.
- Gambi, L. 1950. *La casa rurale nella Romagna*. Firenze, Italy: Olschki.
- Gambi, L. 1977. *La casa dei contadini*. In *Strutture rurali e vita contadina*, Various Authors, 161-189. Milano, Italy: Silvana Editoriale d'Arte.
- Garcia, L., J. Hernández and F. Ayuga. 2003. Analysis of the exterior colour of agroindustrial buildings: a computer aided approach to landscape integration. *Journal of Environmental Management* 69(1): 93-104.

- Garcia, L., J. Hernández and F. Ayuga. 2006. Analysis of the materials and exterior texture of agro-industrial buildings: a photo-analytical approach to landscape integration. *Landscape and Urban Planning* 74(2): 110-124.
- Heinrich, A. and R. Kaufmann, 2005. Landwirtschaftliches Bauen und Landschaft. *AGRARforschung* 12(1): 28-33.
- La Regina, F. 1980. *Architettura rurale: problemi di storia e conservazione della civiltà edilizia contadina in Italia*. Bologna, Italy: Calderini.
- Mennella, V.G.G. 1996. Inserimento nel territorio degli opifici agro-industriali. In *Quaderno n. 18 della Rivista di Ingegneria Agraria*, eds. P. Amirante, A. Failla, C. Bruno and F. Marzano, 467-488. Bari, Italy: AIIA.
- Ortolani, M. 1953. *La casa rurale nella pianura emiliana*. Firenze, Italy: Olschki.
- Pagano, G. and G. Daniel. 1936. *Architettura rurale Italiana*. Milano, Italy: Quaderni della Triennale.
- Rossi, A. 1966. *L'architettura della città*. Venezia, Italy: Marsilio.
- Ruda, G. 1998. Rural buildings and environment. *Landscape and Urban Planning* 41(2): 93-97.
- Smardon R.C. 1979. *Prototype Visual Impact Assessment Manual*. Syracuse, New York: State University of New York.
- Smardon, R.C., J.F. Palmer and J.P Felleman. 1986. *Foundations for Visual Project Analysis*. New York, NY: John Wiley & Sons.
- Tassinari, P. 2008. Caratteri evolutivi dell'edilizia rurale. *Agribusiness Landscape & Environment Management* 11(1): 61-67.
- Tassinari, P., E. Dall'Ara, D. Torreggiani, S. Benni and G. Paolinelli. 2009. L'identità culturale dei sistemi insediativi nella creazione e gestione permanente del paesaggio rurale: contributi di analisi per la pianificazione. *Overview di Architettura del Paesaggio* 20.
- Turri, E. 1998. *Il paesaggio come teatro. Dal territorio vissuto al territorio rappresentato*. Venezia, Italy: Marsilio.
- Venturi Ferriolo, M. 2002. *Etiche del paesaggio. Il progetto del mondo umano*. Roma, Italy: Editori Riuniti.