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**Mid-level Landscape of Marche's Ridge.
Settlements, Agricultural Enterprises and Management of the Territory**

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MID-LEVEL LANDSCAPE OF MARCHE'S RIDGE. SETTLEMENTS, AGRICULTURAL ENTERPRISES AND MANAGEMENT OF THE TERRITORY

Abstract

The work aims at elaborating an investigative methodology which can highlight the transformation of territorial structures and the social-economic dynamics that influence management of the territory and landscape in order to provide operative instructions for an integrated elaboration of instruments for urban planning and economic programming.

The investigation has taken into consideration, using GIS instrument, the evolution of the landscape, of the road network, of the settlements and of the socio-economic system in the period that goes from the early decades of the 19th century to the present period. The territory for analysis is situated along the “internal Marche ridge” of the Apennines, in the province of Ancona (Marche region).

Key words

ecotonal context, settlements, sparse building, agricultural and natural landscape

JEL Classification System: R 14 Land Use Patterns

Field of research

The work aims at elaborating an investigative methodology which can highlight the transformation of territorial structures and the social-economic dynamics that influence management of the territory and landscape in order to provide operative instructions for an integrated elaboration of instruments for urban planning and economic programming.

The territory for analysis is situated along the “internal Marche ridge” of the Apennines, in the province of Ancona (Marche region) with a part in the Regional Natural Park “Gola della Rossa e di Frasassi”.

The study has been conducted on the landscape of the area in a multitemporal and multisectorial perspective (social-demographic, urban, landscape, economical). The study has led to the comprehension of the system dynamics in an evolutionary sense, aimed at identifying negative tendencies and programs useful to bring such tendencies back towards greater eco-compatible perspectives.

The territorial system is characterized by a high degree of environmental sensitivity, and a prevalence of “intermediate agricultural landscape”. The landscape is prevalently of a semi-natural kind. Here the agricultural activity of the hilly areas meets the mountains composed of woods and pastures. The semi-natural landscape requires – in conformity with the guidelines of the European Landscape Convention – regular maintenance and management that makes the conservation of its characteristics compatible with the expectations of the society and economy.

The area under study is an ecotonal area both from a morphological and natural point of view. The landscape, prevalently agricultural, is presently undergoing a phenomenon of gradual abandoning of agricultural activity and re-naturalization. This is due to the heavy depopulation that has characterized the area in the past 50 years, to the weakness of the socio-economic system, and to the changing operative and profitable conditions of the agricultural firms. At the same time the influence of the evolving dynamics of the settlements and the development of various forms of tourist exploitation of the territory can be observed.

The investigation has taken into consideration the evolution of the landscape, of the road network, of the settlements and of the socio-economic system in the period that goes from the early decades of the 19th century to the present period. The starting point of our historical analysis has been the drawing up of maps starting from the “charts” of the Gregorian Land Register (“Catasto Gregoriano”) preserved in the State Archives of Rome, that have been reproduced in digital format and have been geo-referenced. To the maps, with the creation of a database, information of the land register has been added that concerns crop productions and socio-economic variables for the setting up of a GIS (Geographic Information System).

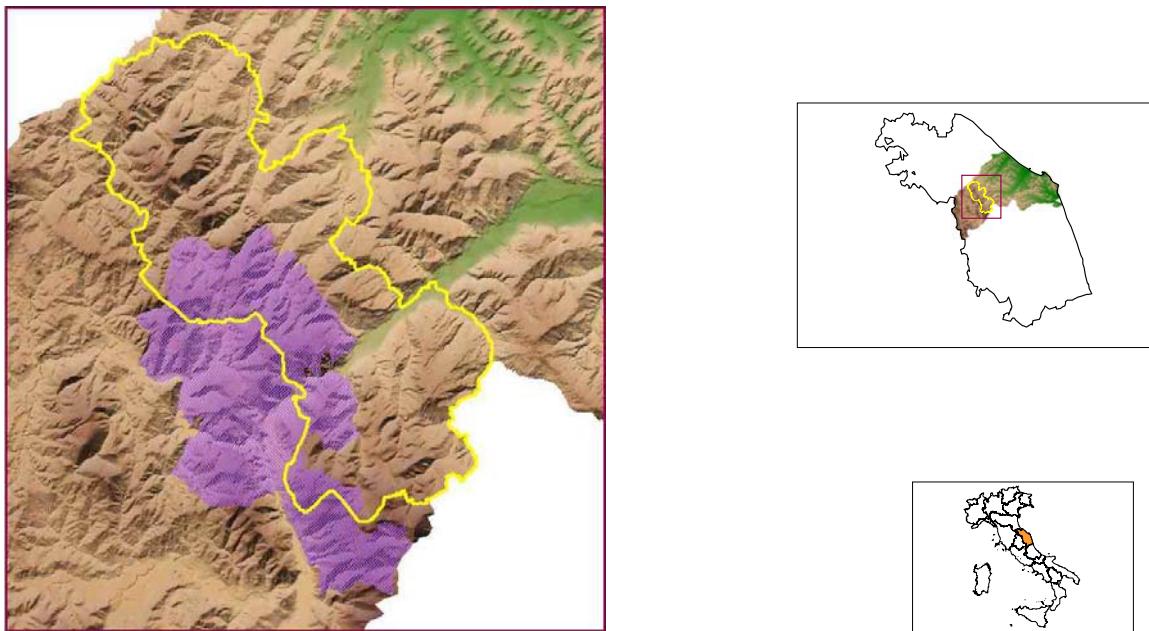


Figure 1. Map of the studied area.

Evolution of the landscape: empirical evidence and interpretation

Variations analyzed with GIS refer to the period between around 1835 (Gregorian land register) and the present situation.

The physical-morphological, geological, botanical-vegetational aspects show how the area has the characteristics of an **ecotonal context**, that links the hilly strip and the mountainous relief of the ridge. Considering the vegetational landscape, the link corresponds to the passage from the area of the crops (with less presence of meadows) to the area of the woods and pastures. This aspect confirms the role of the area as "frontier territory".

As it always happens, the **settlements** “interpret”, with their shapes, the peculiarities of the physical context on which they are located. They also interact with the context contributing more or less to the configuration of the landscape; in this case the “frontier boundary” is a road which joins the historical centres and acts as axis of distribution of the road system. It is a way that often coincides with the separating line among the various categories of geological formations.

As far as **sparse building in the area** is concerned, the analysis has highlighted a significant decrease in the total number of the buildings. This is the most consistent change which has been recorded in our study as regards the settlements between the two above-mentioned temporal periods. This decrease appears significant because it goes against the common belief that, in the hilly areas, there is an increase in sparse buildings due to an increase in non-agricultural buildings and an increase in part-time employment in agriculture. The loss of complexity of the agricultural landscape goes along with the decrease in sparse building.

As far as the relationship between **agricultural landscape and natural landscape** is concerned, an increase in forests in the mountain sector has been observed. The increase in forests have involved above all those lands occupied by meadows and arable land in the 19th century. Therefore, a development of forests, and in less measure of shrubs areas, shows itself, demonstrating a dynamism of the vegetation which begins with the abandoning of agricultural and pastoral practices. Lands occupied by pastures have in fact considerably decreased in the above-mentioned period in all the area, in particular in the hilly strip, with an increase in crop growing.

The **arable land** (with or without trees) has shown a reduction in the period concerned. The areas involved in such a decrease are located above all along the Apennines ridge. A detailed analysis of the two typologies highlights a decrease in the surfaces of the arable land with trees. Instead, an increase in the areas exclusively occupied by crop cultivation can be observed. This simplification concerns above all the hilly strip, where a reduction in the presence of diffused arboreal elements in the fields and a development of these elements on the edge of the fields, along the ditches or water courses can be observed. Such phenomenon points out a heavy increase in riparial vegetation, which on the contrary in the 19th century was less present.

The **arable lands with trees** represented a very common landscape element in the 19th century, that characterized the agricultural landscape of the hills of the Marche region. These sowable lands are crops associated with different types of trees (i.e. oaks, mulberrys, olives, etc.) or with rows of vines (associated with maples, etc.). At present the disappearance of the “métaier system” (“mezzadria”) and the simplification of the agricultural systems in the recent decades has determined a rarefaction of the trees (mulberrys, olives, rows of vines, etc), contributing to the disappearance of one of the principal elements of the variety of the landscape. However, the hilly landscape is still quite rich with arable lands with trees. They represent one of the most important aspects of the hilly landscape of the Marche region.

The trend of the **population**, in the period considered by the study, represents one of the elements significantly correlated to the transformation of the settlements and the agricultural landscape. It is possible to identify two macro-phases concerning demographic dynamics and those of the settlements in particular.

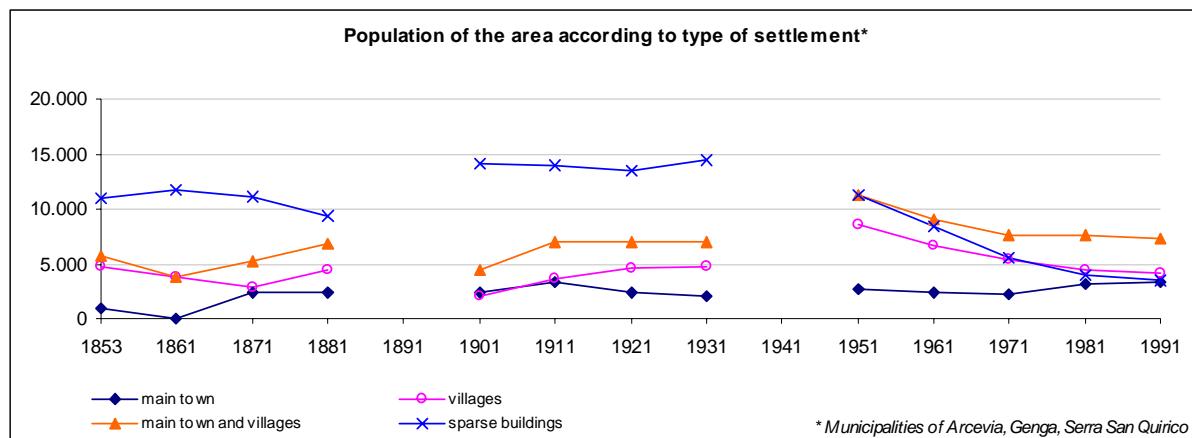


Figure 2. Population of the area according to type of settlement.

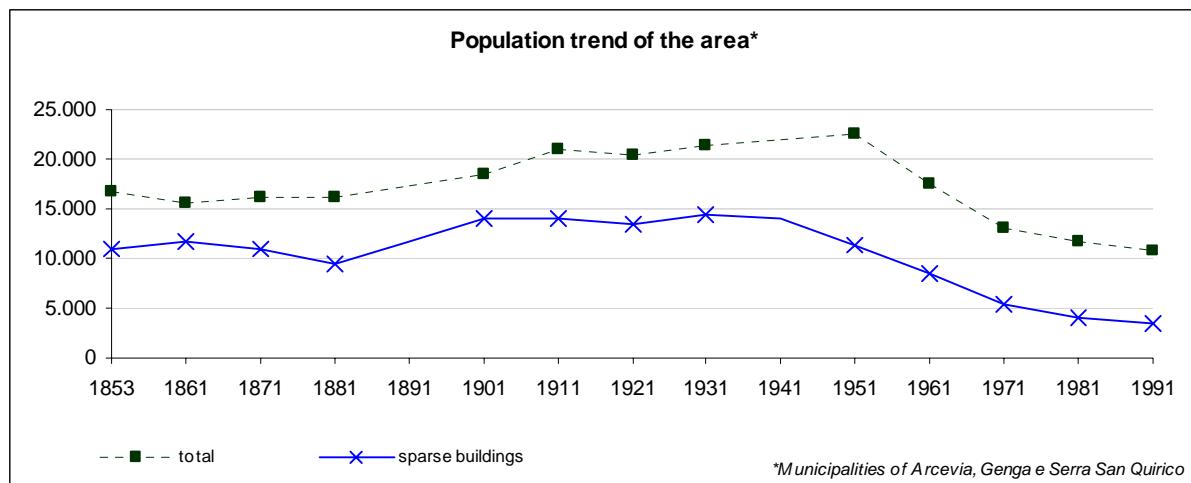
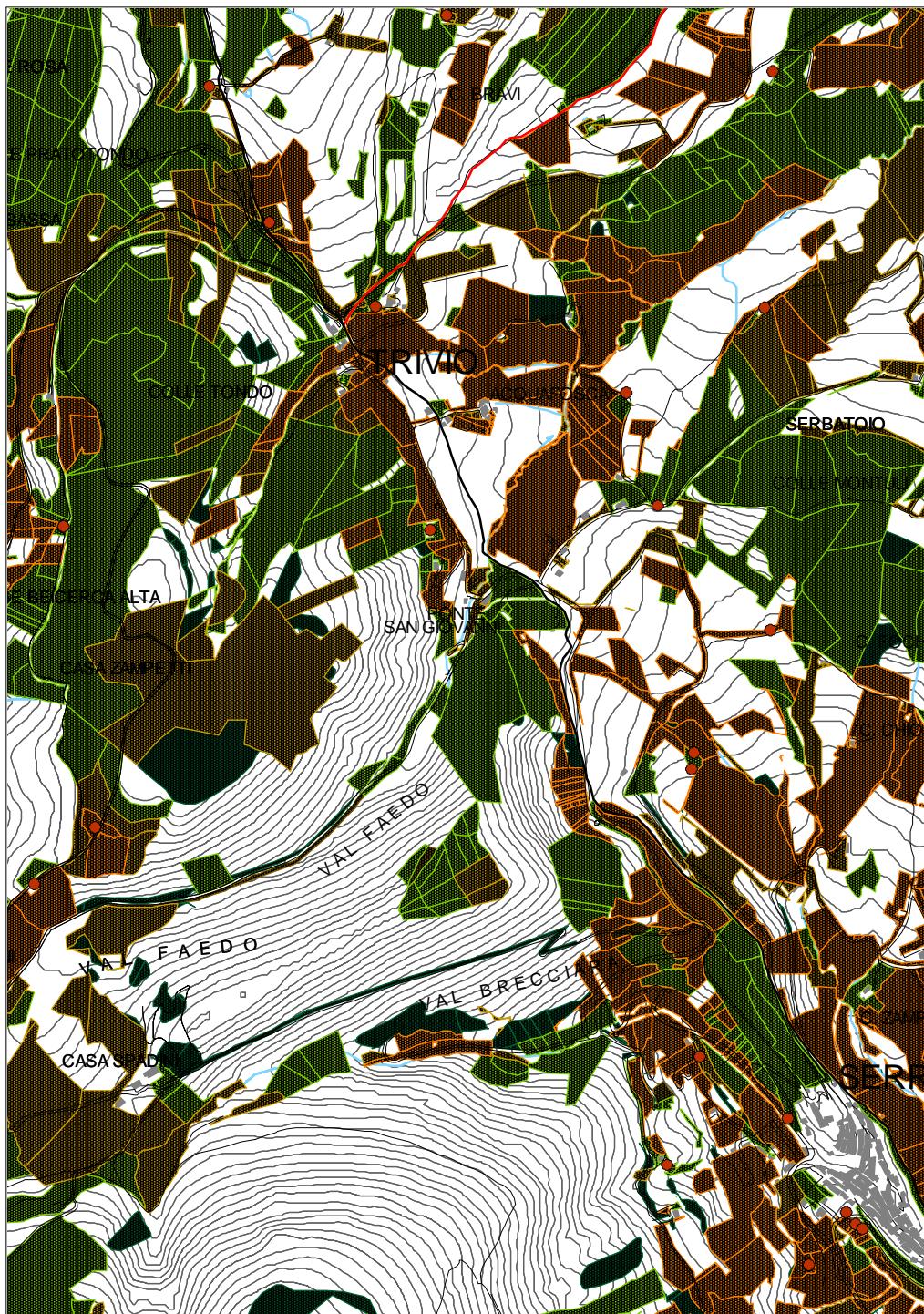


Figure 3. Population trend of the area.

The population has continued to increase gradually from the second half of 19th century to the first half of 20th century. Most part of the population, of the observed area, used to live in sparse buildings and rural villages, in coherence with the dominant agricultural and socio-economic model. The increase in the population created strong pressure on the agricultural system and on natural resources, leading to an increase in the cultivable land also beyond areas traditionally suitable for agriculture (ecotonal areas), but to detriment of woods and pastures.

Since the second half of 20th century the population has decreased, concerning general abandoning of the hilly and mountainous areas. At the same time the remaining population has started to concentrate in the main centres. The sparse buildings have been abandoned.

In short, changes in the landscape show those that have been the changes in the agricultural system: abandoning of sparse buildings and decrease in the presence of farmers on the territory, simplification of the system of cultivation and a shift from intensive to extensive agriculture, renaturalization, loss of complexity of the landscape and decrease in its attractiveness.



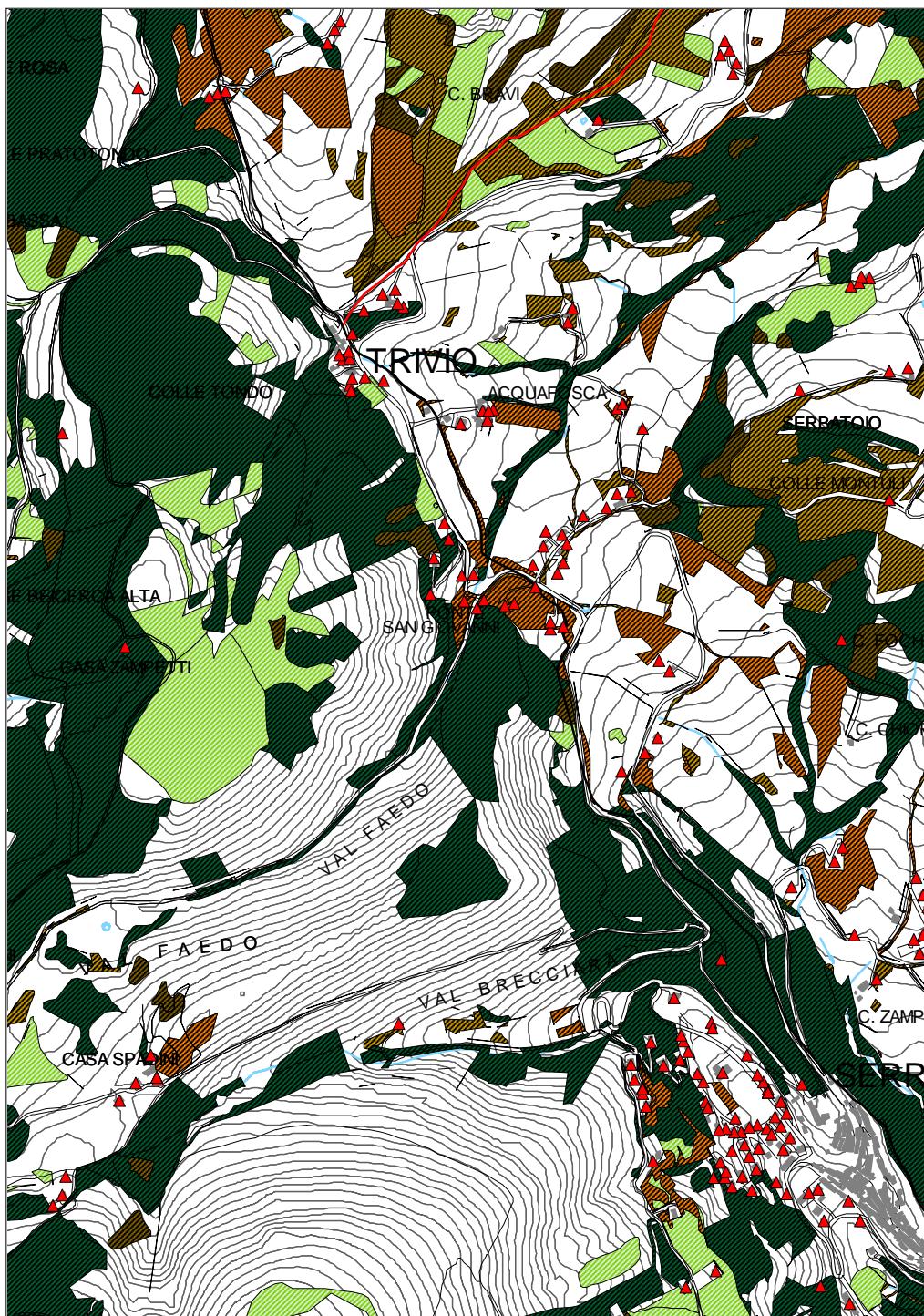
- Heterogeneous agricultural areas decreases
- Arable lands decreases
- Grasslands and pastures decreases
- Forests decreases
- Shrublands decreases
- Rural building not more existing

Figure 4. Landscape transformation. Comparison between Gregorian Land Register and present cartography. Decreases Analysis.



- Annual crops with permanent crops persistences
- Arable lands persistences
- Grasslands and pastures persistences
- Forests persistences
- Shrublands persistences
- Extraurban fabric persistences

Figure 5. Landscape transformation. Comparison between Gregorian Land Register and present cartography. Persistences Analysis.



- Annual crops with permanent crops increases
- Arable land increases
- Grasslands and pastures increases
- Forest increases
- Shrublands increases
- ▲ Extraurban building increases

Figure 6. Landscape transformation. Comparison between Gregorian Land Register and present cartography. Increases Analysis.

Agricultural enterprises

Transformation of agricultural activities that has influenced the transformation of the landscape in a decisive way has not lead to the creation of profitable agricultural enterprises.

Only very few enterprises reach satisfactory income levels, as shown in the economic stratification diagram of enterprises.

A part of enterprises, in fact, produces only for themselves. The remaining enterprises, produce for selling. 55% enterprises that sell have an income lower than 5,000 € and 34% of the enterprises that sell earn between 5,000 and 12,500 €. These incomes do not qualify them to be a professional enterprises. A further element to point out is the correlation between the sales income and the age of the farmer. 60% of enterprises with sales lower than 12,500 € are managed by farmers over 60 years. This relationship changes for larger enterprises, where the presence of younger farmers is more important.

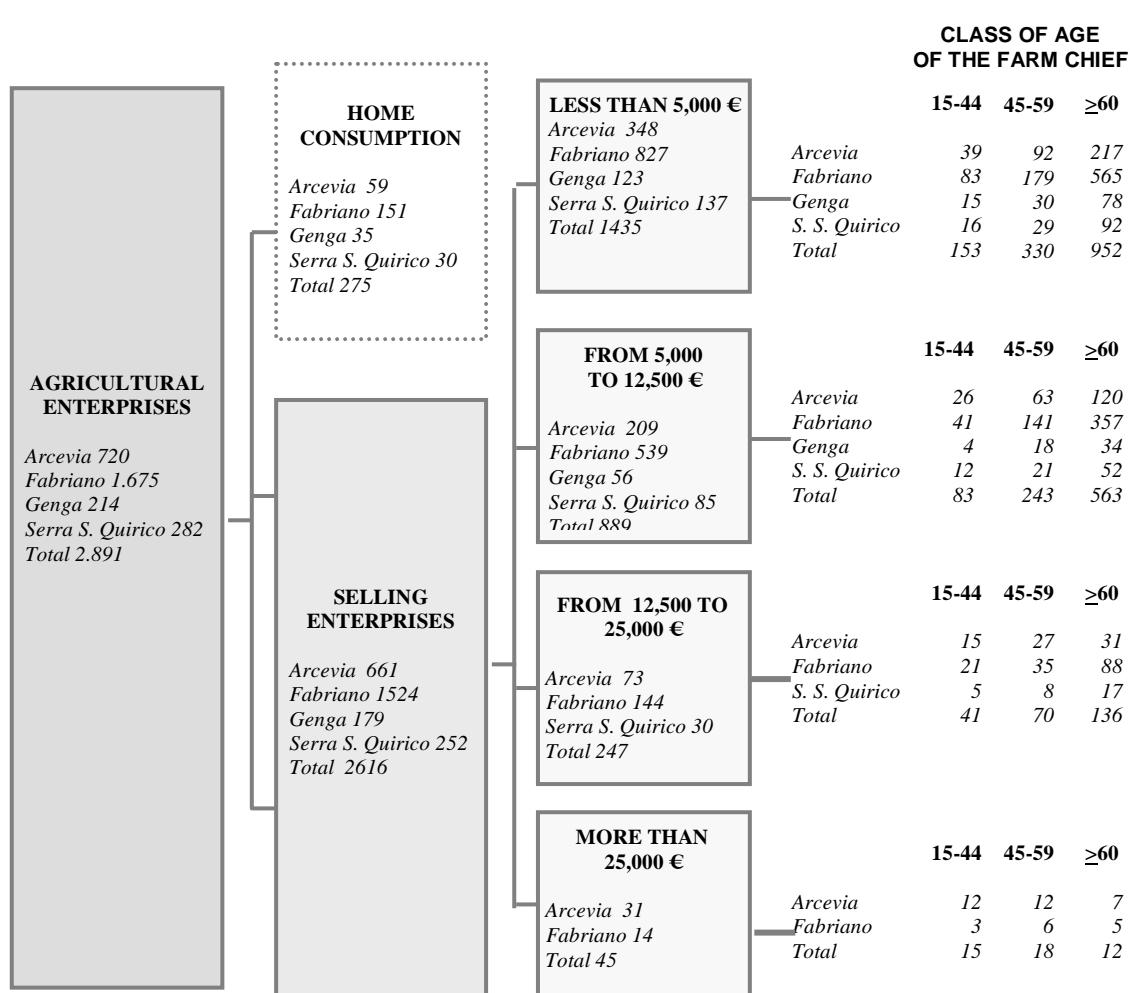


Figure 7. Economic stratification diagram of the agricultural enterprises (data in Euro) - year 2000

Our research has therefore analyzed, through a study of several cases and the proposal of various models of undertakings, conditions for engaging young entrepreneurs in agriculture, opportunities of giving value to environmental services, forms of business multifunctionality and of diversification of incomes, able to reverse this trend and to act positively on the agricultural landscape.

It emerges from the analysis that the most dynamic enterprises are those that have differentiated their activities and that have undertaken activities which go beyond cultivation. Most of these enterprises have developed various activities, choosing production of quality products (oil, wine, cattle breeding). Most of these enterprises have adhered to the EEC Regulation 2078/92 and the RDP Measures for organic agriculture and reforestation.

Programming for territorial planning: a landscape project

Analysis of transformation of agricultural landscape, in the period between the first half of the 19th century and present day, has demonstrated how it is possible to represent, in terms of reduction of the complexity and variety of the landscape, the processes that have taken place and the current tendencies in the examined area. The reduction in the complexity of the landscape lies in the contextual decrease of heterogeneous cultivation and of arboreal and shrubby vegetation density.

This fabric, characterized by heterogeneity of agricultural elements and by their diffusion on the land, organized in a geometrical system of regular, constant, precise rows, has presently been replaced by a large mesh weft formed by lines in the hilly territory where vegetation is concentrated (running water, slopes, roads, property boundaries). These lines enclose large plots of arable land or, in other words, fallow land.

There are well grounded reasons to think that these transformations lead to a loss in value of the agricultural landscape.

In this situation an intervention project on a large scale on agricultural landscape, above all in the hilly area, will have to set up an arduous task of reinstating, on significant territorial dimensions, the general characteristics of the landscape: the density of arboreal and shrubby vegetation, alternation of heterogeneous cultivation within rather limited spaces, relatively uniform displacement of elements to reduce the differences between the center and margin of the plots of land, etc.

Even if this project will not bring back the landscape to its original state, it will however recall some of the essential aspects of this landscape which will be compatible with the current conditions of production.

Programming for territorial planning: some proposals for the agricultural policies

In our present study, operative conditions of agricultural enterprises in the mountainous and hilly areas have been analyzed, aiming, on one hand, at verifying which transformations at a commercial level have provoked such a deep effect on the organization of the agricultural landscape, and on the other, at searching for those models of firms and those commercial activities that today have an economic justification and their own profitability, also in the light of the “new model of European agriculture” that the European Union is delineating.

While the CAP has till date worked towards separating agriculture and entrepreneurial decisions from the relationship with the territory, the recent reform, decoupling the payments from the productions, proposes territorial dimension of enterprises, pushed to make productive decisions consistent with the “territorial vocation”, above all in the case of diversification strategies.

The tendencies of the market can be a stimulus for resumption of some characteristics of agriculture for maintaining and recuperating the typical and traditional landscape, and for safeguarding the natural resources and, in general, for allowing agriculture to perform that social role which is requested by the public community.

Faced with the evolution of the demand the tasks of agricultural policies are changing and becoming more complex, as regards the beneficiaries (not only farmers) and the fields on which the policies intervene.

The general aim can be "to support" the market, supplying the agricultural system with the resources and capacities necessary to elaborate and realize strategies of development which are able to take up the new opportunities offered by the evolution of the demand.

In general we can consider:

- interventions aiming at supplying the farmers with the capabilities to understand the changes in the market and getting them to intervene in an adequate way (e.g. education and information policies aiming at creating new entrepreneurial and managerial expertise; aid in terms of contributions for investments or access to the credit for diversifying production; research activities, in particular as regards market analysis and innovation; pilot projects showing feasibility of production diversification);
- intersectorial interventions able to go beyond the contrast between agricultural and non agricultural sectors, as territory is an element which is common to the various economic activities (e.g. policies for the development of rural areas; policies of communication and territorial marketing);
- policies for influencing public opinion directed towards increasing public awareness and towards changing general attitude in concrete demand for products and services (e.g. food and environmental educational activity; informative activities about characteristics of food products; communication campaigns).

If some new "products" have a market which is able to add value to the agricultural product, for example quality foods or educational activities, most of them assume the characteristic of "public goods". The absence or malfunction of the market requires public intervention allowing the payment of these "products" (INEA, 2004).

In particular, the agricultural policy has focused its attention on environmental issues, such as "greening" of the CAP, directed towards integrating aims concerning environment and landscape conservation and the management of the territory and the rural areas in the agricultural policies (sectorial and characterized by quantitative aims) (Sumsy, Buckwell, 2003).

The solutions pursued by the agricultural policies, that started with the Agenda 2000 Reform and strengthened with the current Fischler Reform, are principally two:

- acting on the "second pillar" of the CAP (rural development) by financing "virtuous behaviour" of the farmers (agro-environmental measures);
- acting on the "first pillar" (markets policies), giving contributions to the farmers at specific condition depending on their eco-compatible behaviour (eco-conditionality).

We could add a third solution specially for Italy provided by the Italian legislation (Dlgs no. 228/2001), aimed at "creating" a market for environmental services offered by agriculture, through stipulation of contracts and conventions with the local governments.



Figure 8. On the road to Arcevia – Fifties – Picture of G. Cavalli (Mormorio D., 2001).



Figure 9. Rows of vines with permanent crops (mulberrytrees) – october 2004.

The territorial added value and the necessity of collective behaviours

In its application to a specific area like the territory in question, efficacy of the policies depends on two conditions:

1. presence of definite criteria of landscape and environmental and territorial priorities on a local scale that are able to direct and influence the choice of each operator;
2. achievement of a critical mass of each attitude and behaviour, coherent with the above-mentioned criteria, able to have an evident impact on the territory in terms of landscape and environment.

In order to follow these objectives it is necessary to act with various instruments which are coordinated between each other, through:

- connection of agricultural policies to instruments of existing territorial planning and their integration, where required, with instructions or indication of landscape and environment;
- adjustment of existing policies to landscape and territorial priorities that have been identified, through specific planning tools in RDP programs (e.g. increase in fundings; priorities to the allotment of resources; specific measures; modulation of incentives on the basis of "enterprise biodiversity parameters", directed towards increase in cultivations and landscapes diversification in every single farm);
- development of other specific instruments of diffusion and territorial activity able to stimulate and direct attitudes and behaviour of the operators: e.g. *manuals* for the recovery of traditional agricultural handmade articles (hedges, fences, haylofts) or the traditional techniques (grass cutting, etc.);
- development of instruments of intervention of collective kind such as territorial contracts or agro-environmental area agreements, directed towards the attainment of the adhesion of a critical mass of single entrepreneurs, able to generate a real impact on limited areas with high landscape value.

Another way to follow, at least in the middle-long period, could be regionalisation of some of the "conditions" which the agricultural activity must respect for the maintenance of the EU contributions, with particular reference to the Natural Habitats and the Good Environmental and Agronomical Condition.

The eco-conditionality could be applied, as regards the protection or the recovery of elements characteristic of the agricultural landscape (e.g. management of pastures, waters regulation, increase in certain arboreal species, crop rotation, conservation of natural habitats and biodiversity, etc.), at homogeneous territorial area level, giving support to forecasting territorial and environmental plans, where they exist, or foreseeing the realization or the integration where they lack.

The outcomes of this application would have a significant effect at a territorial level, as there are a large number of agricultural enterprises which receive contributions from the CAP market policies and risk reduction or loss of the contribution.

Conclusive remarks

The work opens further research in various directions, identifying some pilot areas which test new managerial models, foreseeing simulation of management impacts both on business profitability and landscape configuration.

Analysis of the operative conditions and functions in agricultural enterprises for maintenance of territory and landscape in the area under investigative study can not ignore use of all the instruments which are at the disposal of agriculture: both by giving importance to opportunities that the market offers in terms of diversification of activities and remuneration of environmental services, as well as

by opportunities offered by public financing for recognition of multifunctional character and services of agriculture.

The recent reform of the Common Agricultural Policy that draws agriculture near to the market but at the same time recognizes and gives importance to its multifunctional component, can be the right opportunity for predisposing a set of instruments of agricultural and territorial policies aimed on one hand at maintaining agricultural activities in marginal lands and, on the other hand, at safeguarding the environment, the territory and the landscape.

We would however like to highlight the complexity of the problem. In order to find solution to this problem, coordinated interventions, that involve various players and that put in act all the instruments available, are necessary, such as:

- local territorial agencies for the definition and adjustment of the territorial planning tools;
- regional authorities for the definition of adequate intervention policies in the agricultural sector, in training, in marketing and communication;
- farmers through the sensitization to environmental themes and their capacity to exploit in the right direction their income opportunities;
- community able to elaborate, express and apply its sensitivity to the themes of the environment and landscape conservation.

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