Agricultural management in peri-urban areas

The experience of an international workshop

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Preface[1]

This volume presents the proceedings of an International Workshop on "Agricultural management in peri-urban areas" organised by the UMR Métafort of Clermont-Ferrand (France) and the Land Lab of the Scuola Superiore S. Anna of Pisa (Italy) which was held on the 11th and 12th of June 2009 in Pisa. The idea behind the workshop was to continue the collaboration started in 2004 between UMR Métafort and Land Lab for the development of research and educational experiences regarding agricultural management at a territorial level by matching geographical and agronomical competences. In fact, research concerning the management of agriculture is characterised by an increasing interest in approaches that include a territorial perspective.

Widespread focus on the issue of rural development and multifunctionality in agriculture has introduced the concepts of up-scaling and down-scaling. These concepts refer to the need to consider the farm and its configuration/organisation as a component of farming and agricultural systems and, vice versa, to consider farming and agricultural systems as a collection of different farms and farming systems. Thus agronomic research, which is usually carried out at a field scale, is acquiring and adapting tools and methods from other disciplines in order to consider more comprehensively the potential multiple services provided by agriculture. This includes the interactions between farm/field and their surroundings, e.g. up-scaling from a local agro-ecosystem scale to an agro-eco-region scale. In the same way rural development strategies may be downscaled from administrative regions to local markets, also in terms of the configuration and organisation of the agricultural land.

Therefore the territorial perspective is part of a rural development debate that highlights the shift from sectorial to place-based policies, thus contributing to enforce the multifunctional role of agriculture. This approach helps to satisfy increasing societal demands, which are much more effective if fulfilled at a broader level (e.g. the conservation of biodiversity, the protection of water quality, the maintenance of landscape diversity) and is a way to match the stakes of different decision-makers and actors in the planning process. Peri-urban agriculture is thus an appropriate topic for the development of agronomy and territorial agronomy, as is the integration with other disciplines. The hybridisation with geography represents a good oppor-

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tunity that we can define as geo-agronomy, as such the integration with economy, planning, ecology.

The main goal of the workshop was to provide an opportunity to compare the research carried out by French and Italian teams on the role of agriculture in the planning of peri-urban areas, along with the effects on farming and agricultural systems of the new relationships between the city and countryside. In fact, in Italy and France the zoning and plans are not the same, and neither are the stakeholders, the models of peri-urban development, nor the agricultural spatial configurations and organisations. Therefore, this workshop aimed to reflect on these differences for a more effective management of agriculture in peri-urban areas by comparing good practices and experiences.

This contribution to peri-urban farming is based on two main points. The first is to intentionally proceed with scenarios and spatial representations as an approach, rather than by a simple state of the art of the peri-urban issue (Chapter 1). The second is to propose multidisciplinary perspectives and new analytical paradigms to agricultural management in peri-urban comparing the experiences of French and Italian teams supported by a laboratorial experience carried out in Province of Massa Carrara.

In the same way as the workshop, this volume is organised into parts that have been considered as strategic and synergistic in order to approach the management of peri-urban agriculture in a more realistic and applicable way. These concern the policies on agriculture in peri-urban areas (Chapter 2), the main stakeholders involved in the management of agriculture (Chapter 3), the planning of agriculture in such areas (Chapter 4), the sustainability of peri-urban agriculture (Chapter 5), a field case study about planning in the coastal area of Massa Carrara Province, presented by the technicians of the local authority (Chapter 6). The conclusions synthesise some final considerations.

Peri-urbanisation and peri-urban agriculture: issues and proposals

Introduction[2]

The phenomenon of peri-urbanisation has been increasing for several decades in Europe. The scientific community is trying to define theoretical paradigms in order to identify the drivers and to develop analytical tools to interpret them.

Public authorities are trying to implement effective regulatory procedures to overcome the side-effects of peri-urbanisation, such as urban sprawl, featureless countryside, and, more recently, the environmental damage of more mobility and dispersion.

At the same time, farming is changing in order to respond to multi-functional issues and also to generate new development opportunities. If new forms of farming are emerging and the systems left behind after the modernisation of agriculture are re-emerging, the agricultural development in peri-urban areas remains largely unknown. There are several peri-urban dynamics that are expressed at different organisational levels. The differentiation of peri-urban areas is an intrinsic quality that zoning statistics or sectorial developmental models do not fully explain. The processes of peri-urbanisation lead to hybrid areas which can be concentrated or restricted to the edges of peripheries, according to different spatial configurations. It is often the urban point of view that is taken into account, without reference to rural perceptions of these fringe areas. The theoretical framework lacks shared definitions of peri-urbanisation and peri-urban agriculture.

Our aim is to contribute to a more general and comprehensive debate by proposing our own specific definitions which are grounded in our own specific field.

Definitions of peri-urbanisation

There are different aspects of the peri-urbanisation phenomenon. Firstly, it is important to analyse the diversity of spatial configurations, and then to take into account new spatial entities, which are neither urban nor rural, but both rural and urban at the same time.

In the literature peri-urbanisation is considered as a controversial issue (Roux and Vanier, 2008). For some, it marks a degeneration of the city-countryside relationship, it hides treasures far from cities, it is the triumph of individualism, and is not sustainable. For others, it represents a new era

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of life in the countryside, creating new peripheral polarities and is a model for new forms of sustainable development. In any case, urbanisation is generally considered as the result of changes produced by urban drivers.

In the French debate, for Bertrand[3], peri-urbanisation in Europe acted like an advanced frontier of urbanisation, an ex-urbanisation of functions, a de-densification of the city. Caruso (2002) explained the morphologies of urban sprawl using a differentiated combination of individual behaviours and socio-economic processes. Moriconi-Ebrard (2008) found that urban sprawl came from the same anthropological logic as the Garden of Eden model, and claimed that it was going to lead to a reorganisation of spatial dynamics around vacuums, on the borders of peripheries. Piron (2008) considered that the request for the spatial comforts of inhabitants needed to be taken into account. This spatial comfort is linked to inhabited areas, to the private open area, and to the areas of community facilities. Talandier (2008) showed two ongoing processes, the enlargement of the centres to the peripheries, but also the long distance mobility, both processes carried by different motivations and populations. Comby (2008) not only made assertions about the transformations of the work, but also of leisure activities; not only residential mobility, but also the creation of large shopping areas, warehouses, and industrial premises. The intersection of these processes is the specificity of peri-urban areas and the interest in designing new forms of territorial organization.

In the Italian debate, if Camagni (1994) hoped that there could be a shift from conflict and predatory conditions of the city on the countryside to a cooperation, Pascucci (2008) underlined that rural and urban development policies are not in conflict, but can contribute to a more comprehensive territorial development.

Ventura et al. (2008) claimed that the phenomenon does not have the transitory and dynamic character of a migration phase, when the peri-urban countryside represented more job and earning opportunities. In fact, they regarded it as a stable condition for the expansion of diffused cities and also for rurbanisation processes (urban populations transferred to peri-urban rural areas). Merlo (2006) focused on the definition of *rurban countryside* as a more appropriate expression than *urbanised countryside* because it enables us to frame any interesting innovations these areas in terms of new rurality, instead of new urbanity. Lastly, Pascale (2009) highlighted that in German the art of building and of farming have the common use of the term “bauer” deriving from “baun”, which means “inhabit”. This suggested that the non urban or agricultural areas can take advantage of being governed by this vision.

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[3] NEWRUR project: urbaN prEssure on RURal areas http://newrur.grenoble.cemagref.fr/

Therefore using our territorial agronomy perspective, peri-urbanisation is the sprawl process by which the spatial organisation and the development model of agricultural areas, proximal to urban ones or enclosed within them, evolve in new spatial configurations and there is a new establishment of governance, stakeholders and such like.

Definitions of peri-urban agriculture

In this peri-urbanisation context, the different questions raised about agriculture are the product of a new mobility, of new qualities, temporalities, functionalities, and territorialities. In fact, this includes the new mobility of inhabitants and also of farming production networks. Furthermore, there is a demand for the quality of products and spaces, temporalities that have a tendency to disconnect in the short term in terms of supply and in the long term due to changes in production systems, and in eating and health habits. This leads to a differentiation of farming functions in relatively restricted local areas and the necessity to structure multiple territorialities into different levels of stakeholder action such as producers, consumers, inhabitants, policy-makers. If farming is an activity that does not appear fundamentally linked to the city, it provides a service in terms of local farming (Chometon, 2009), of landscape production and lifestyle (Planchat-Héry, 2008), and of the management of urban areas (Loudiyi, 2008). It is important to open up some room for discussion in which farmers are the interlocutors for urban planners in terms of a more transversal vision of farming in peri-urban areas. In these areas, agriculture can also be considered as the expression of new rural development organisations that are shifting from laboratorial and ongoing experiences to framed and place-based organisations (Galli and Bonari, 2009).

We introduce the concept of peri-urban agriculture as a multi-actor, multi-function, multi-scale agriculture based on the provision of food and fiber supplies along with environmental and social services. The final aim is to satisfy urban and rural societal demands locally, or in other words, the demands of the new rurban community.

Peri-urban, rural, and agricultural perspectives: French experiences

In order to investigate the place of farming in peri-urban territories, it is relevant to take into account the perspectives of peri-urban areas. A projection into the future is a way of giving shape to territorial project figures (Debarbieux and Lardon, 2003) in order to build a perspective of the present (Heurgon and Landrieu, 2000).

Peri-urban perspectives

The evolution scenarios carried out for the DATAR[4] on "The peri-urban futures of France in Europe" (Vanier and Lajarge, 2008), resulted in five different scenarios:

- The peri-urban swallowed up by the urban: the high cost of mobility and environmental constraints lead to an end of dispersion. The compact and concentrated urban model organizes relations between the city and its rural countryside.
- The peri-urban is dissolved into spatial comfort: the dominant peri-urbanisation and renewable energy technologies lead to dispersion, a de-densification of urban areas and an unequal quality of product spaces.
- The peri-urban is transformed into peri-rural conservatory: the creation of living areas between the city and the countryside by a process of labelling and certifications. In this controlled and channelled peri-urbanisation, the values that are the foundation of *peri-rurality* favour natural sanctuaries, farming areas with an environmental logic.
- The peri-urban taken over by inter-territoriality: there is an increase in exchanges, high mobility, coordination between territories and the creation of intermediate areas, interfaces, and networks. This peri-urban mosaic is facilitated by the multifunctionality of farming.
- The peri-urban is requisitioned by city-regions: the very strong environmental constraints require the management of ecological functions, with high technology in periphery areas. This kind of management is undertaken in accordance with a productive mode of coveted ecological goods, leaving rural fringes, passage areas, and marginalities.

Rural perspectives

The evolution scenarios carried out by INRA on the "New ruralities in France in 2030" (Mora *et al.*, 2008) take four elements into account: mobility in the city-countryside connection, economic growth in the countryside, natural resources, property, nature, environment and the governance of rural areas. Four different scenarios are proposed, in which farming takes diverse forms:

- A countryside of a metropolitan spread: the peri-urbanisation of large agglomerations, with the spatial extension of peri-urban areas around a regional metropolis with urbanisation spread out more and more widely around the metropolis. Farming activity necessitating little

[4] DATAR: Délégation interministérielle à l'Aménagement du Territoire et à l'Attractivité Régionale: it gives a legal dimension of the central government to the public policy conducted in interregional territories.

space for an acceptable revenue develops in local interstitial areas: organic market gardening, proximity agriculture or conventional farming. Further away, farming production remains intensive: agribusiness, AOC[5], and IGP for hypermarket distribution networks. Nature zones are protected and the forest is productive or protected.

- Intermittent countryside of metropolitan areas: individuals who belong to multiple groups and who are mobile lead to the temporary usage of different areas and to constant movement. The preservation of landscape, cultural, and productive heritage goes through AOC or organic products, on local markets. Protected areas are structures for the quality of landscapes and resources (water, air), and lifestyles and activities are diversified (tourism, wildlife, plant life, hunting, fishing). Farming practices are mastered at the level of the environment and biodiversity, there is diversification (gîtes, direct sales). Industrial farming is relegated to outside the area, in a localized and limited manner.
- The countryside serving urban densification: the energy crisis forces a redensification of cities, with a verticalisation of housing in big cities. The rural area is divided into farming land and nature zones, with a intensive production of food and non-food goods (agrofuel, windmills), production zones surrounding large logistical centres that have considerable advantages, vast natural areas and large forest areas and an intra-urban agriculture in a limited area, bearing in mind water and energy management, and health risks.
- The countryside in the grids of city networks: the reorientation of residential migrations produces a balanced and diversified development of rural areas. There is a close interlacing of cities and the countryside and a balance between living areas and activities in the territories. It is a question of guaranteeing the compatibility of a diversity of productive forms: the diversity of production systems and industries, networks of small cities and villages, a combination of industry, craft, and farming. The landscape is varied, with an entwinement of protected areas, areas for ecological and landscape quality, and cultivated areas needing an institutional management of this diversity.

Agricultural perspectives

To complete this panorama, evolution scenarios by the Ministry for Agriculture, "Objective Lands: 2020. For a new French agricultural model" (2008) reviews the five challenges of the French agricultural model, concerning the quantitative and qualitative management of water, biodiversity and

[5] French quality label for agricultural productions

landscapes, farming lands, and energy. It advocates, of the five courses of action for a new agriculture, rethinking the practices adapted to territories and to put agronomy back at the centre of agriculture.

What lessons can be drawn from these perspectives? We are forced to accept that agriculture is not at the centre of the concerns of peri-urban experts; the scenarios proposed by DATAR do not make any reference to them. As for the scenarios from INRA, they review the existing forms of agriculture and favour one or another according to the scenarios, but have trouble contemplating the territorial integration of agriculture. In order to apply such concepts, Terres en villes (CERTU, 2008) proposes different ways to take agriculture into account in the SCoT[6]. It is necessary: to use space carefully, because fertile land is a non-renewable resource; to give a view of agriculture in terms of land tenure, because it is a diversified economy; to favour the conservation of memory and the roots of agriculture, because it is part of the identity of the territory and contributes, through its environmental functions, to the management of water and natural risks, to fight against greenhouse effects, to value waste, and to increase the value of landscapes and tourism. We will focus on three ways of considering agriculture: the land, the living environment, and production (see Planchat, this publication and Loudiyi et al., this publication).

Conceptual and methodological framework

We propose a conceptual framework to consider peri-urban areas as a hinge, and agriculture as a territorial resource (Lardon, 2008; Méasson et al., 2009).

A hinge – an interface zone between parts of a territory – has not been researched very much. However, it constitutes an original solution to go beyond the borders between rural and urban areas. A hinge has several functions: i) as a marker, delimiting distinct spaces ii) as a convergence point, favouring exchanges, iii) as a specific resource to exploit, iv) as an advanced frontier of strong dynamics, and v) as borders preserving protected areas.

Thus, to understand what is at play as far as territorial dynamics are concerned, it is a question of identifying hinges and analysing how they operate. Setting up a territorial project can then be based on their structures. Each territory can highlight its different hinge positions. The reasoning in terms of pivotal positions lies in the obligation towards openness: thinking in terms of hinges means having to f see the bigger picture, changing scales and thinking about dynamics. The concept defines an explicit framework of negotiation for the territories, alliances between territories by means of

[6] ScoT: Schéma de Cohérence territoriale (Land Coherence Plan). The SCoT is a town planning document that defines the development and territorial planning for the next 15 years.

hinge positions. This then provides a natural framework to ask questions concerning rural issues. Questioning territories on the way they live and their prospects for the future as a hinge highlights rural concerns and remobilizes different sectoral approaches e.g. agricultural or touristic led (Lardon and Piveteau, 2005). Furthermore, they accentuate the interactions between territories, rather than focusing on the specific coherence of an individual territory, and thus make the approach in terms of inter-territoriality operational (Vanier, 2008).

Applying this analytical grid made us consider the fact that interface municipalities between urban and rural areas had other alternatives than that of becoming peri-urban. Another consideration was whether they were composed of inter-municipalities taking advantage of their positioning to be the engine of rural/urban areas that stimulate the hinterlands, rather than the advanced frontier of the city/desert. In this way we formalized five models of organisation for hinges referring to the interface between rural and urban areas (Figure 1).

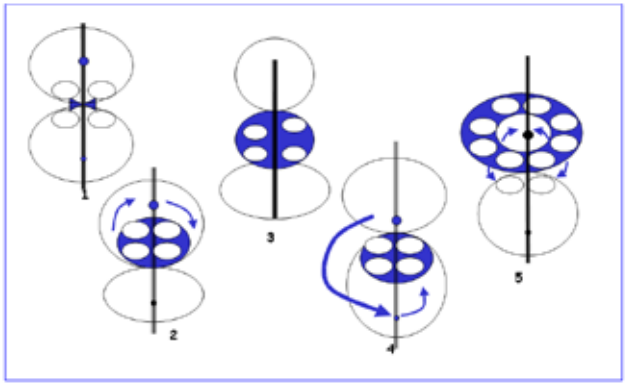

Figure 1: urban and rural organisation models.

- *Model 1 Urban*: territories are based on urban logic, rural inter-municipalities are included.
- *Model 2 Peri-urban*: rural inter-municipalities are formed in relation with the urban agglomeration
- *Model 3 Rural*: rural inter-municipalities are made up as an individual territory based on rural logic.
- *Model 4 Epi-rural*: the rural inter-municipalities are formed in relation with a rural territory that is itself linked to an urban agglomeration by intermediate poles
- *Model 5 Epi-urban*: rural inter-municipalities are formed in relation with the urban territory and play a pivotal role in neighbouring rural territories.

This analytical grid can be used to characterize and understand the interactions between urban and rural territories. These hinge situations require discussions to take place between stakeholders that do not usually work together, who do not have the same representations, nor the same methods of action. It is important to develop methodologies to facilitate synergies and complementarities between parts of territories, put forward by stakeholders who are collectively organised.

Peri-urban, rural, and agricultural perspectives: Italian experiences

Researchers and local authorities in Italy have also been increasingly interested in peri-urban areas. This interest has mainly been due to the convergence of several demands and interests. On the one hand are the farms requiring the maintenance of suitable conditions for crop production, on the other hand are the manufacturing sector and urban community who need more and more space, and finally there are various grassroots movements who require the active conservation of natural, cultural and historical resources that are threatened in peri-urban areas.

We have previously seen that in the French context, peri-urban agriculture is recognised as a specific type of farming system. This is not the case in Italy, where peri-urban agriculture has essentially been consumed by the urban sprawl. Hence, its sustainability is not well defined because it depends on external drivers. However there are several interesting examples concerning the conservation and management of peri-urban agricultural areas in Italy. In Lombardy, for example, there are experiences of both a centre (Istituto per la Tutela e la Valorizzazione dell'Agricoltura Peri-urbana) made up of farmers' unions, and regional universities. These two contribute towards a more effective management of agriculture, environmental resources and landscape around the settlements and cities and several peri-urban parks, of which is the first agricultural park (Parco agricolo sud of Milano) in Italy. Other similar experiences of peri-urban agricultural parks that focus on the conservation of local resources are in Asti, Casal del Marmo (Roma), and Prato.

Furthermore, local planning tools have given new functions to agriculture in the peri-urban areas through the valorisation of existing urban gardens or the creation of new ones (e.g. in municipalities of Bologna, Roma, Milano and Turin).

Moreover experiential hybridization between different disciplines has become more and more frequent; peri-urban agricultural areas are emerging as a complex system where development is based on enforcing complementarities and supporting integration (Branduini and Sangiorgi, 2005; Mininni, 2005; Fanfani, 2009; Giarè, 2009; Torquati and Giacchè, 2010; Agostini and Bertoni, 2010).

In the Italian debate there are some shared theoretical paradigms (Figure

2), reflecting different models of development based on:

- the diversification of the farm as a way of enhancing farm multifunctionality (also defined as multifunctional diversification);
- territorial approaches including the different spatial components of peri-urban systems;
- integrated approaches aimed at creating synergies and cohesion among different actors and resources;
- a sense of place.

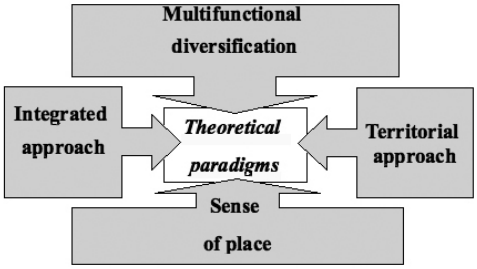

Figure 2: theoretical paradigm for peri-urban agricultural development.

From these concepts we derived a proposal for three types of agricultural systems of agro-urban development that were developed considering the Italian situation but which could be extended to other regions (Galli *et al.*, 2010). We represented these types through schematized representations of territories as an adaptation of the chorem-based approach (Lardon, 2006).

Types of agricultural systems for agro-urban development

These types included several main elements: the spatial configuration of land use, the relationship between farming and urban systems, the main functions of agriculture and the way such functions are fulfilled. These are the main analytical tools we used to interpret the relationship between the urban and the rural in order to derive the main needs for planning and programming in peri-urban areas (Figure 3).

Below the three types of agricultural systems are presented: (Table 1).

1st step - Analytical approach to characterise agricultural systems			
Spatial configuration of the agricultural system	Main functions of agricultural system for the urban community	Different ways to fulfil the functions of the agricultural system	Typology of the relationships between farms, agricultural, and urban systems
2nd step - Spatial and functional characterisation of the relationships			
3rd step - Planning and programming needs			

Table 1: From analysis to planning for agro-urban development.

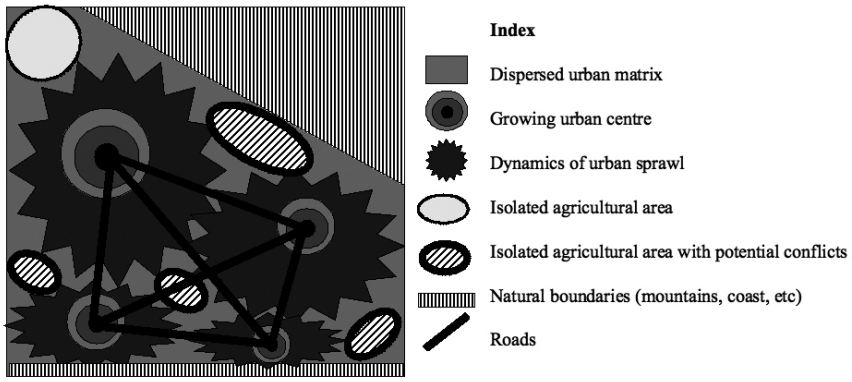

Figure 3: systems presenting a diffuse and dispersed urban matrix.

Systems presenting a diffuse and dispersed urban matrix: in this type, the urban matrix is almost continuous although broken by small closed agricultural areas that can be called infra-urban (Figure 4). This type can be found in areas presenting natural boundaries e.g. coasts or mountains, or in areas where the urban sprawl has not been planned. Frequently there is a high impact of linear infrastructures i.e. roads, highways, and railways.

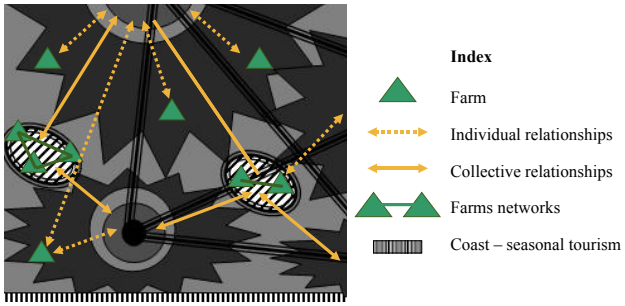

Figure 4: the relationships between urban and agricultural areas.

Farms may have individual or collective relationships in different parts of the urban area. Such relationships can be seasonal where tourism is well developed (Figure 4). The isolated agricultural areas in this system influence the main agricultural functions and hence the agri-urban development. On the one hand this isolation is a disadvantage (for example for the small fields, conflicts with local inhabitants, the high price of the land) but,

on the other, it makes the management of agricultural areas easier. Here farms sustain multiple functions: the conservation of green areas, ecological and environmental protection, and the management of traditional residual landscapes. They can also have several social functions for example in environmental education or children's nurseries on farms. The presence of boundaries strongly influences the farming systems. Fruit and vegetable growing are the most common because they do not need large surfaces and are suitable for direct selling. In some cases they are added to small scale livestock. When incomes are low and non-agricultural work opportunities are scarce, there is a high share of part-time and hobby farming.

Systems presenting an urban matrix organised in poles and lines: in this case, there is a separation between the urban and the agricultural/rural matrix. The urban sprawl is limited to the surroundings of urban centres and linear infrastructures. Therefore, the rural matrix still presents its productive structure and agricultural areas are almost continuous (Figure 5).

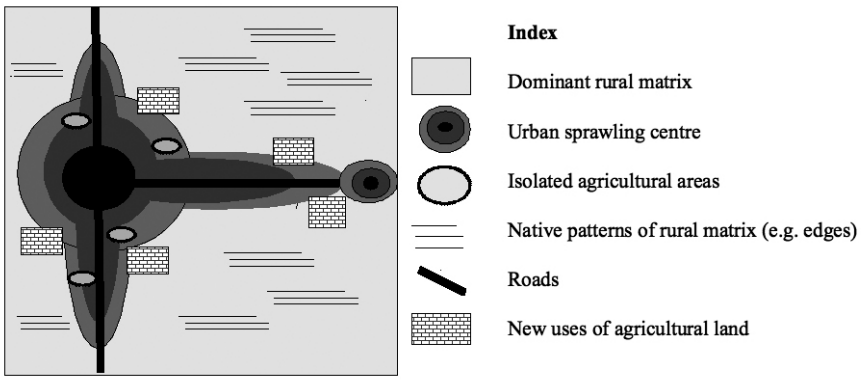

Figure 5: systems presenting an urban matrix organised in poles and lines.

Rural and agricultural identities are proportional to the distances from the urban areas and the linear infrastructures. There are few isolated agricultural areas in or proximal to urban areas. These isolated areas present the same dynamics in terms of conflicts and functions as the previous system. In contrast, in the rural areas the productive, environmental and landscape functions of agriculture are not jeopardised. With respect to the previous system, there is a higher availability of agricultural land and less conflict with inhabitants. However, the large space available nearby urban poles may lead to important land use changes e.g. the creation of large industrial areas. For land planning, it is important to preserve the continuity of the agricultural areas in order to ensure the fulfilment of the main agricultural functions. In these areas farms are quite heterogeneous to their farming systems. There

is a mix of full-time, part-time and hobby farms and production is greater than the previous system, presenting also cereals or livestock farms and a mix of more or less intensive fruit and vegetable growing. The relationships between urban and agricultural areas are more diversified and stable in time than in the previous system. These relationships are individual or collective, direct or mediated by several types of organisations e.g. a food supply-chain presenting the direct sale of processed agricultural products (Figure 6).

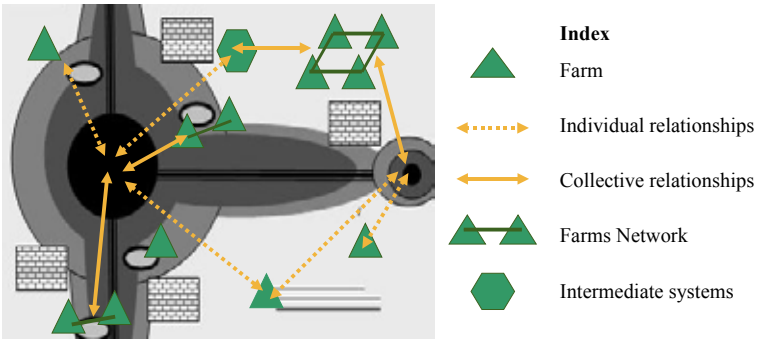

Figure 6: the relationships between urban and agricultural areas.

Systems presenting a prevailing rural matrix: in this case, the urban centres are small and sparse, like islands within a dominant rural matrix. The urban sprawl is scarce and limited to the main urban centre (Figure 7).

This system is not frequent and is characterised by a substantial conservation of traditional agricultural and rural structures. The conservation of this system is ensured by the distance from the main poles of economic

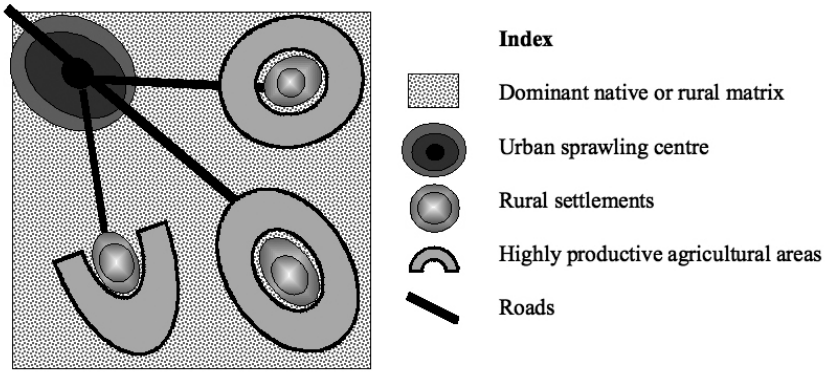

Figure 7: systems presenting a prevailing rural matrix.

development, by the presence of important natural or human boundaries (e.g. a natural park) or by the strong land suitability for a particular kind of production, for example wine. Because of this large agricultural use of the land, there is an important conservation of natural and landscape elements that ensure important functions as such the conservation of the biodiversity, the protection of soil fertility, the conservation of hydrological integrity. Farms in these areas are often full-time and of a medium/big size. In such cases, agriculture can also be exploited for rural tourism and therefore generate new development opportunities when integrated with urban systems. An example is the creation of food or no-food micro-districts. Intermediate organisations are heterogeneous presenting different combinations in space (e.g. local or peri-urban organisation) and time (seasonal or weekly activity); the manufacturing and urbanisation of services of areas that are proximal to a town may be useful for developing this agricultural system (Figure 8).

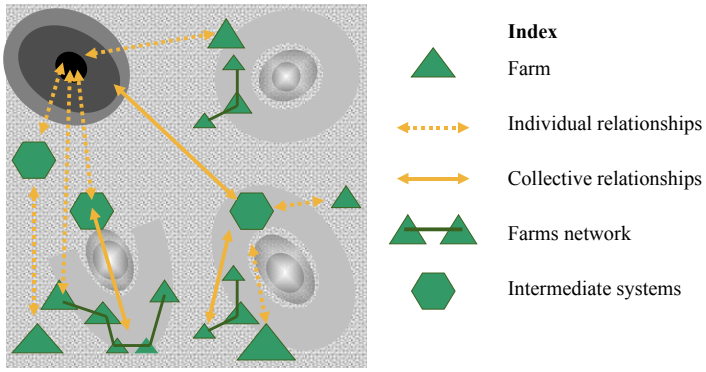

Figure 8: the relationships between urban and agricultural areas.

Spatial representations for peri-urban agriculture management

Territorial agronomy may be a useful framework for the sustainable development of peri-urban agriculture and its territories. A theoretical and analytical framework provides several tools for analysing and interpreting the spatial configurations observed and the dynamics of territorial development. With this information it is possible to evaluate different scenarios that are important to forecast the future and give the actors room to manoeuvre when planning and organizing their actions. Spatial representations can be useful for territorial dynamics, not only because they help us to visualise the transformations needed, but also because they contribute to the transformation representations of the various stakeholders in terms of perception, requests and refusals about what is happening or could happen. Therefore

modelling evolution scenarios, supported by spatial representations, is a powerful way to have stakeholder participation in the collective design of a territorial project. Thus stakeholders are empowered to act collectively and anticipate change. But this territorial project has different drivers and effects that have to be considered.

The spatial approach of territorial agronomy facilitates interaction with other disciplines, such as geography, sociology, economy, planning, which are fundamental for the agricultural management of peri-urban areas. This multidisciplinary approach offers renewed synergies to take into account multiple scales, functions and actors concerned about the management of agriculture in peri-urban areas.

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Policies supporting peri-urban agriculture

Introduction[1]

The relationship between the town and the agricultural activity that takes place around it has roots in a very distant age. The background of medieval paintings shows that from the dawn of the first urban settlements there was a perceived need to surround towns with plots of land devoted to growing products. The purpose was to be able to quickly satisfy the food-related needs of citizens and to offer an easy placement for agricultural products.

The marriage between towns and the surrounding countryside takes on new colours in the light of the modern concept of agriculture as a multifunctional activity. Within the Italian legal system this has been formally enshrined in the new definition of the agricultural entrepreneur set out in Act 228/2001 of the EU legal guidelines.

Within this new legal framework, agricultural activity no longer plays the traditional role as only the manufacturer of products. Rather, it is seen as a provider of a range of services to the tourism-related industry, as well as a means for the enhancement, safeguarding and management of the environment and the landscape. This provision of services is intended to occur in cooperation with other business and cultural initiatives, which take place within rural areas and are conducive to their improved use.

This revolutionary approach reflects the evolution of the real situation at a legal level. New horizons seem potentially to open up. The ancient, functional and bilateral links between the town and peri-urban agriculture is getting richer from several aspects. The range of benefits arising from such links is becoming broader and extends from the economy to the quality of life: the use of fresh food products, the decrease in pollution, the improvement in the energy balance, the preservation of the rural landscape vis-à-vis the threat of the urbanisation of green areas.

On the EU front, increasing attention has been paid to the structural and natural disparity between rural and peri-urban areas, which are subject to growing pressure from towns, and rural areas further away, which have been affected by depopulation and decline. The attempt to apply the common policy of sustainable development to rural areas in the light of such a disparity is clearly highlighted in premises 2 and 11 of the EC Regulation no 1698/2005 dated 20 September 2005.

However, the substantial absence within Italian law of provisions aimed at supporting and enhancing peri-urban agriculture has frustrated any expectation of a renewed willingness to seize the potential opportunities offered by the EU law.

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The safeguarding and enhancement of this particular (as to its location) agricultural activity is left on the one hand to regional lawmakers and their decisions when agricultural development plans are drawn up; and on the other hand with local administrators when planning instruments regarding the use of the territory are set up.

Finally, there is no sign of any legislative will in this area with respect to the landscape, although a step in this direction would be justified by several legal provisions that have been made at an international level. As a matter of fact from this point of view national legislation is also silent. All it does is to put some pressure on the co-authors of landscape plans, i.e. the Regions and the Ministry for cultural assets and activities, for them to pay particular attention to safeguarding agricultural areas when drafting landscape plans. This is to be done by providing for zoning and building development which should be compatible with the several levels of value attached and with the principle of the least possible damage to the territory and in any event not to affect the landscape value attached to each area.

This session provides two in depth examinations.

Xavier Guiomar, a geographer at UMR SAD-APT (Paris), proposes a reflection on the relationships among peri-urban agriculture and local authorities in terms of policies for proximities. By exemplificative cases in Île de France, he examines the main policies interesting peri-urban agriculture concluding on the need to integrate such policies which are managed at different levels and with heterogeneous means.

Gianluca Brunori and Stefano Orsini, rural economist at Department of Agronomy and agro-ecosystem management at University of Pisa, analyze some of the factors that play a key role in changing rural-urban relations and the main their effects, with a focus on the preservation and development of peri-urban agriculture, as well as how a good marketing plan for food distribution in cities can contribute to cheap and differentiated food accessibility, keeping down the emergence of urban food deserts coherently to the principle of food democracy.

Peri-urban agriculture and local authorities: which policies for which proximities? Example of local policies in Île de France[1]

Riassunto Nelle aree peri-urbane, l'agricoltura è influenzata da tre diverse categorie di attori: gli abitanti (sia in forma associativa, sia individuale), i soggetti politici (in particolare le istituzioni locali, dal comune alla regione) e le comunità agricole. L'agricoltura può essere percepita da queste tre categorie come un'entità spaziale, un'attività economica, un ambiente, un paesaggio, una produzione, un patrimonio culturale o un bene pubblico. Possono essere identificate cinque tipologie di politiche in grado di avvicinare abitanti, agricoltori e istituzioni: politiche fondiarie, di sostegno alle strutture, di qualità dei prodotti e dell'ambiente, di commercializzazione, di integrazione dell'agricoltura e di governance. Si rinforzano o indeboliscono una con l'altra, anche se sono gestite a diversi livelli amministrativi e con diversi mezzi. La sostenibilità del progetto agricolo peri-urbano è importante nelle dinamiche di interazione tra abitanti, politici e produttori, in poche parole nell'emergenza di uno spazio condiviso che in Francia porta il nome di pays.

Résumé L'agriculture, en particulier en périurbain, se situe sous l'influence de trois types d'acteurs eux-mêmes interdépendants: les habitants, regroupés ou non en associations, les acteurs politiques (en ce concentrant ici sur les politiques locales, de la commune à la région), et le monde agricole. L'agriculture selon qu'elle est appréhendée plutôt comme un espace, un ensemble d'entreprises, de milieux, de paysages, de produits ou comme un patrimoine ou un bien commun se déplace à l'intérieur de ce triangle d'acteurs et d'influences. On peut identifier cinq types de politiques qui engendrent différentes proximités entre agriculture, habitants et territoires: politiques foncières; de soutien aux structures; de qualité des produits et des milieux; de commercialisation; d'intégration dans le patrimoine et la gouvernance. Elles se renforcent ou s'affaiblissent les unes les autres même si elles sont gérées par plusieurs niveaux de collectivité aux moyens très variés. La durabilité du projet agricole périurbain se joue dans l'implication croisée des habitants, des politiques et des producteurs, en bref dans l'émergence d'un pays.

Agriculture, a land issue with political, economical and social issues at stake

There are three types of actors involved in agriculture, and especially peri-urban agriculture (INRA, 2009), who all interact and are interdependent:

- *The inhabitants* who are also consumers and citizens (meaning mostly taxpayers and voters), and who express themselves individually or through associations.

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- *Policy-makers* (local councillors) and administrations who intervene in agricultural areas and activities.
- *The agricultural economic community* who manages cultivated land and who concentrates on it its fixed assets (buildings, equipment, soil fertility).

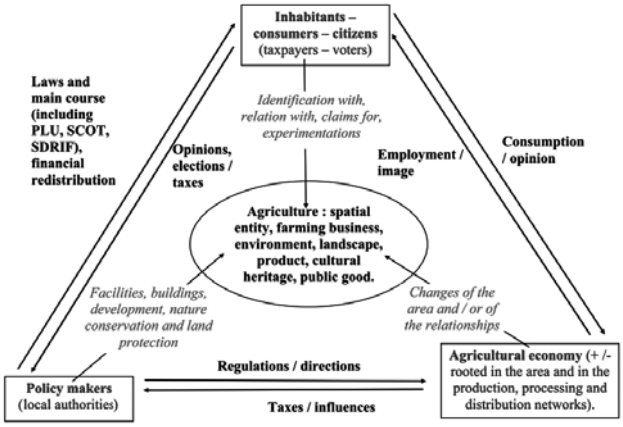

Figure 1: interactions of the three types of actors with agriculture perceived simultaneously as a spatial entity, farming business, environment, landscape, product, cultural heritage and public good.

By listing these representations we can better understand the misunderstandings that may occur between these three types of actors in their perception of agricultural areas and activities; it also shows the different types of proximity, chosen or not, with agriculture (Husson, 2008). Links and proximity between inhabitants and agriculture are manifold:

- *geographical proximity* agriculture – inhabitants (urban or peri-urban), which varies according to level of proximity between housing and agricultural land;
- *commercial proximity* producers – consumers linked to the interest of consumers for local resources and the origin of food, and with their possible search for a direct supply and connections with producers;
- *political proximity* farmers – citizens, which varies depending on the awareness of the inhabitants regarding the impact of the various farming, processing and distribution systems on the land and society;
- *cultural proximity* connected with the level of knowledge (or ignorance) of the technical, economical and social realities of agriculture.

In terms of proximities with inhabitants and the expectations of local policy makers, the agriculture of Île de France is full of contrasts[2] (De Biasi, Stephan, 2004):

[2] Source: Direction Régionale et Interdépartementale de l'Agriculture de l'Alimentation et de la Forêt d'Île de France

- 11.5 million inhabitants (18% of the French population in 2% of the land); 53% of regional land is cultivated, of which 90% is large-scale industrial farming (mainly wheat, colza, barley).
- 5,300 farms (of which 4,000 are professional) and 10,000 full-time jobs (0.2% of regional employment). Market gardening, horticulture and arboriculture make up 20% of the farms, but share between them only 1% of the regional cultivated land.
- Organic farming covers only 1% of the regional cultivated land. The national government objective is 6%.
- The number of farms is decreasing each year, with an average annual rate of -3%. The decline reached - 29% between 2000 and 2005 in terms of the number of fruit and vegetable producers. There were 1,800 market gardening farms in 1970, 375 today (which means -30% of market gardening surface areas, -80% of market gardening farms).
- Île-de-France is officially the first food-processing region of France with 7,550 firms and 95,000 jobs. However, this industry cannot really be considered as being connected to regional agriculture.
- Île de France: the top tourist destination in the world.

In addition to European and national policies, four levels of local authorities influence agriculture directly or indirectly:

- the regional council
- 8 county councils including Paris
- 106 "intercommunalités" (whose councillors are elected by town councillors) which include 70% of the municipalities and 62% of the regional population (except Paris): 4 new towns, 33 urban communities ("communautés d'agglomérations"), 69 rural communities ("communautés de communes"), and 4 Regional Natural Parks (PNR).
- 1,281 municipalities.

Clearly, these levels of local authorities do not have the same competences but the region, departments and municipalities (apart from the transfer of some competences from municipalities to the group of municipalities) benefit from the "general competence clause" (Vanier 2008, Cadiou 2009). This enables them to act in all sectors beyond the official sharing of "competences blocs" in order to satisfy local public interest. As we mentioned earlier, since agriculture stands at the crossroads of many policies (land ownership, environment, economy, etc), it is, or can be, influenced by all levels of local authorities. Rather than analysing the policies of each of them one by one, it might be more useful to identify how agriculture is anchored to the land and the inhabitants along with the relevant policies at each level (Guiomar, 2002 and 2004). We will now consider the proximities resulting from these policies and the connections created between agriculture, inhabitants and local authorities. Case studies and common policy analyses reveal five levels

for local policies, which represent five public fields of intervention that local authorities can choose to invest in or not, with or without an overall objective for the future of agriculture and the future of its links with inhabitants and lands:

- Land ownership and land access policies
- Policies supporting agricultural production structures
- Product quality and agricultural environment quality policies
- Marketing policies
- Policies favouring agricultural integration in the local cultural heritage and governance

Land ownership, land access and planning policies: how to manage proximities and borders between agricultural and built areas

The examples below show the predominance of the municipalities and regional levels in these policies (Darley, Leproust, 2009). The evolution of land ownership and planning issues in agriculture can be seen in the evolution of a series of regional development plans: in the 1970s the focus was on spatial management, in the 1980s it was urban structuring, during the 1990s the focus was on agriculture in terms of its economical and cultural heritage, and in first decade of the 21st century on its landscape and ecology. In 2010 climate concerns are the main priority as well as biodiversity, social demand and international attractiveness. The SDRIF[3] is recognized as the essential reference document particularly in terms of its *general destination map of the various parts of the land*. The fact that the SDRIF proposal that was approved by the regional council in September 2008 remains non enforceable because brought to a standstill by the State highlights the importance of the document and of land planning policies on development alternatives. The French State found in the SDRIF not enough economic "ambitions" for the Île de France region, and thus, considers the region to be too restrictive in terms of urban development. Nevertheless, the SDRIF (dated 1994 like the 2008 proposal) does not settle (all territorial planning: firstly urban development zones need to be specified in local urban planning documents (PLU[4] for municipalities and SCOT[5] for groups of municipalities). Secondly it allows for a "moderated development of villages and hamlets in continuity with existing built areas" estimated as being 5% of existing built areas for 2010-2030. Rural municipalities of the Île de France have therefore a sizeable responsibility for agricultural land preservation (Table 1).

[3] Schéma Directeur de la Région Île de France: Regional leading plan of IdF

[4] Plan Local d'Urbanism: Local urban plan

[5] Schéma de Cohérence Territorial: Land coherence plan

Local levels	Means	Objectives	Resulting proximities and connections created
Municipality of Périgny sur Yerres	• One of the first POS1 in France (1974) • Convention with SAFER2 to buy large-scale farm lands before turning them over to serviced market gardening plots (land consolidation, drainage, irrigation) • Making of a walk path in the middle of the market gardening plots, and building of a Nature and Environment House.	• To avoid urban sprawl • To develop a food producing agriculture able to deal with urban plans. • To create with the municipality a meeting place for the rural and urban world.	• Proximity between walkers, children (House of Environment) and market gardening production, easy to watch above the low hedges. • Stabilisation of the urban front and by the way of proximity of housing with cultivated lands.
Association Triangle Vert (5 municipalities)	• Inventory of fallow lands in order to turn over as many plots as possible to agriculture. • «Land ownership watch» Convention with SAFER, definition of PRIF3, acquisitions, and long-term lease drawn up with farmers • Definition of an «agricultural enterprise zone» in the local urban development plan	• To make it easier to set up farms to keep a critical mass of cultivated lands. • To give security to farmers in their investments. • To acknowledge the financial aspects of agriculture	• To inscribe for long term agriculture in housing neighbourhood. • Land owner awareness improved • Speculation on cultivated land discouraged
Communauté d'Agglomération Marne et Gondoire (urban community)	• Information leaflet on «urban development and agricultural traffic» for local councillors and associations	• To make people understand how agriculture works in the area and accept any disruptions on the roads • To inspire town planners and decision-makers.	• Decrease of the feeling of «rejection of the road» by urbans dwellers among farmers
Regional council	• SDRIF • PRIF • Financial supports to SAFER	• To identify, to concentrate and to limit the main urban development areas. • To stand out against speculators in sensitive areas. • Regulation and incentives to set up farms	• Proximity between urban and cultivated areas maintained by «urban fronts of regional interest» and identification of protected enclaves • Acknowledgement of general interest to set up farms task left to SAFER

[1] Plan d'Occupation des Sols, replaced nowadays by the Plan Local d'Urbanisme
[2] Société d'Aménagement Foncier et d'Etablissement Rural: ownership regulation agency for cultivated land
[3] Périmètre régional d'intervention foncièr: regional land ownership intervention area

Table 1: examples of local policies for planning and land ownership.

A clear trend toward the stabilization of urban fringes can be seen after many sacrifices of strategic areas, notably around the *Francilienne* (third ring road around Paris located around 20 km from the first one). This clarification of land purpose in the medium and long term goes in favour of a better cooperation between the officials working for agriculture (chamber of agriculture) and the local authorities. It also makes it easier to take possession of the outer suburbs (*territoires rurbains*) for local associations often initially set up to challenge urbanization and to safeguard local entities with rural landscapes.

Voluntary land ownership policies

It should be also noted that some municipalities or groups of municipalities or even the Region (AEV, 2009) take up the issue of land ownership in order to act on local farm productions and more precisely to offset the lack of intervention of agricultural organizations in favour of a food-producing agriculture in relation to inhabitants and the area. A market garden set up, which requires several hectares, can thus be effectively supported by a municipality. It can do this by mobilizing SAFER and landowners to free lands, then servicing the plots and allowing farmers' houses to be built. However, the regional council's financial support for SAFER of up to € 600,000 per year does not seem to put pressure on this Organization to regulate the market and to redistribute lands, despite regional wishes for farms to be set up and for food-production development.

Policies supporting agricultural production structures: bringing agriculture and social (taxpayers') claims closer and correcting CAP[6] course

PNR, regional council and departments provide the most important direct local subsidies for agricultural production structure. This financial support is largely directed at production that receives the smallest subsidies from CAP (market gardening, arboriculture, horticulture) and at diversification initiatives that open up farms to their environment by developing better economical and social connections with the local population (CESR Île de France, 2009). Support criteria are therefore aimed much more at environmental or peri-urban issues than the CAP criteria (Table 2).

For instance, the regional support PREVAIR that helps farms to label their products is increased when the project contributes to town-agriculture links in peri-urban area.

Nevertheless, through PRIMHEUR, whose official objective (“modernisation and competitiveness”) is purely financial, the region supports invest-

[6] Common Agricultural Policy

Local levels	Means	Objectives	Resulting proximities and connections created
Communauté de Communes du Plateau Briard (94)	Participation in ADHOM[1] (Departmental Support for Horticulture and Market gardening development)	To preserve agriculture as a financial activity, lasting and lively open space	• Preservation of an employment density that contrasts less with urban density. • Preservation of a common and specific space that brings closer the six municipalities.
4 PNR	• Support for diversification • Support for the implementation of environmental standards on farms • Work on farm buildings and farmyards	• To diversify production and landscapes • Water and biodiversity • Landscape and built cultural heritage	• Production, food and social claims brought closer together • Better image of farmers, from farm surroundings to environmental practises • Integration of farm buildings into local cultural heritage
General councils: departments	• Orchard re-plantation and equipment support • ADHOM • Diversification support • Supports for «Precision farming» • «Agricultural structuring projects» (it's the official term) • Support for *miscanthus* plantation (4,000 € the first year)	• Ecology, cultural heritage, biodiversity, land structuring • Preservation of the last (because a lot of them disappeared) market gardeners and horticulturists • Opening farms to their social environment • Water and biodiversity quality • Preservation of peri-urban agriculture, environment, diversification, built cultural heritage (old housing or rural equipment), employment	• Richer landscape easier to be considered and appropriated . • Broadening of potential economic links with local area • Better clarity regarding agricultural *multifunctionality*
Regional council	• PRIMHEUR[2] (25 to 35% of project costs, +10% if organic, max of 50 K€ / year) • PREVAIR[3] (50 K€ / year max, 15 to 40% of project costs depending on peri-urban issues)	• Support for certificates of quality and farms without or with little help from CAP • «Preservation of market gardening and horticulture: modernisation and competitiveness»	• Diversification of regional agriculture and of its connections with society • PREVAIR support indexed to «links between urban and rural populations»

[1] Aide Départementale à l'Horticulture et au Maraîchage
[2] Programme Régional pour l'Initiative en Maraîchage et Horticulture dans les Espaces Urbanisés et Ruraux: regional programme for market gardening and horticulture initiatives in urbanised and rural areas
[3] Programme Régional pour l'Environnement, la Valorisation Agricole et l'Initiative Rurale: regional programme for environment, agricultural development and rural initiative.

Table 2: examples of policies that support agricultural production structure.

ments in market gardening, horticulture and arboriculture farms unconditionally. Faced with a dramatic fall in the number of market gardeners in Île de France during forty years (-80%), the regional objective is primarily to stem the drain in this sector whether the project is environmental or social.

Note that departments ("Conseils généraux") act principally through their environmental competence but not only, using the *general competence clause* we saw earlier.

Product quality and agricultural environment quality policies: to enhance quality links in consumer and user minds

Instead of making a distinction between environmental policies on the one hand, and labels and (sanitary and taste) quality improvement policies on the other, it seems more relevant to study them together in order to assess the possible link established by local policies between environmental quality and product quality. The PNR, departments and regional councils again play leading roles in this issue. To stimulate economic development while enhancing environmental assets is central to PNR's mission, in particular through their local brand policies. This does not prevent them from financing measures exclusively aimed at the quality of living environment of city dwellers or inhabitants from outer suburbs, close to agricultural activities: in this way the PNR of Vexin Français supports actions in favour of a «limitation of olfactory, visual and noise pollution" by agriculture.

The impact of global quality policies (soil, environment and products) on the local population largely depends on institutional communication. Some labels remain confidential and some important measures regarding soil or underground water quality can only be assessed in the long term.

The culture of agricultural unions also strongly influences the links between products and the environment, according to their conception of farmer's status, whether it is seen as small country farmer or as an agricultural manager (Table 3).

Organic farming is emblematic of this link through its impact on biodiversity, on health (pesticide residues) and on the quality of food. Support policies for organic farming thus acts on the global quality of both the environment and products. The regional council of Île de France has been pioneer by financing half (EU finances the other 50%) of the AMAB, which allocates 151 €/ha per year to cereal growers already certified in organic farming (600 €/ha for market gardeners). The recent CAP reform enables such a support with 100% European funds (by the first CAP pillar) but at a lower level in France (around 100 €/ha for cereal growers): it is good news for organic farmers in other regions who did not benefit from the AMAB, but bad news for the Île de France whose support will be reduced if the Ministry does not allow dual support. This is a good example of the possible competition between regional, national and European agricultural policies.

Local levels	Means	Objectives	Resulting proximities and connections created
PNR	• Park brand • Support for environmental measures in agriculture • Struggle against nuisances • Actions on landscape	• Local identity • Biodiversity • Dwellers in neighbourly terms with agriculture • Quality of products, tourism	• Quality of products linked to environmental quality and landscape identity: local coherence that involves consumers
Departments	• Support to reduce inputs in farming methods • SDEN1	• Water quality • To describe priority spaces, to acknowledge their function	• Farmers encouraged to take more local responsibility towards water quality • Contractual links between support and functions given to cultivated lands
Regional council	• CERVIA[1] • PRAIRIE[2] • Support to GAB[3] • AMAB[4]	• Promotion • Environment • Agricultural and food-processing employment	• Reduction of the gap between local product quality, supply and demand. • Integration of agriculture in regional economy by the use of origin and quality labels

[1] Schéma Départemental des Espaces Naturels: Natural area county programme
[2] Centre Régional de Valorisation et d'Innovation Agricole et Alimentaire de Paris Île de France: Regional centre for agricultural and food development and innovation of Paris and Île de France
[3] Programme régional d'initiative pour le respect et l'intégration de l'environnement: Regional programme of initiatives for the respect and integration of the environment
[4] Groupement des Agriculteurs Biologiques: Organic farmers organization
[5] Aide au Maintien de l'Agriculture Biologique: Support for Organic farming

Table 3: examples of product quality and agricultural environment quality policies.

Marketing policies: to favour producer – consumer trade through proximities and short channels

Each level of local authority is involved in these policies, including *communautés de communes* or *d'agglomération* (cooperation between rural or urban municipalities) benefiting from the economical development competence, which must be transferred from the municipalities. Working on the outlets of a product often enhances the image of the entire channel. In this way some local authorities have put a lot of effort into a local network to piece together unlinked channels. This is the case with the Regional council of the Île de France for the Organic Bread of Île de France as well as with the PNR of Vexin for the Bread of Vexin. This re-forming of local short supply chains promotes the image and the value of the area, which identifies itself with its products and vice-versa. It can stimulate the sales of agricultural products by appealing to tourists, or by their potential symbolic or activist

value for the local population who can support their local agriculture and farmers' income by consuming local. Nevertheless, the gap between the intention and action of local authorities when it concerns their own food supply is often deep, particularly during festivities where local or regional supply possibilities are not explored (Table 4).

Local levels	Means	Objectives	Resulting proximities and connections created
Municipalities	• Modernization and attractiveness of markets	• Liveliness, local life. Social and geographical accessibility	• Attachment to producers, products and the social links of local markets
PNR	• Bread of Vexin (PNR Vexin Français)	• Image and integration	• Possibility to «eat one's landscape»
Departments	• Organic products in schools and institutional catering • Short channel sales • Association «Produits et Terroirs» (products and countries)	• Health • Tourism and local economy support through short channel sales	• To establish a local food culture • Development of a producer's network
Regional council	• CERVIA • Secondary school catering • Modernisation of regional producers area in MIN[1] of Rungis • Support to AMAP to hire regional coordinators • Support direct selling and local markets	• To develop new outlets for new agricultural productions (natural building materials, productions linked to a longer rotation of crops) • To favour the presence of regional producers in MIN of Rungis • Direct selling development	• Integration of agriculture in new processing and distribution networks • Possibilities for regional producers to deal in both wholesale (MIN) and retail trades • Setting up of consumer networks in direct connection with producers, with formalized contracts

[1] Marché d'Intérêt National: National Interest Market

Table 4: examples of marketing policies.

Local authorities can also interfere in producer – consumer relations in two other ways:

- By favouring or if necessary complicating, the setting up of a local super- or hyper-market: a municipality is rarely not involved in such a set up, most of the time being clearly in favour of them because of employment and facilities presented or clearly against because of employment and facilities lost in the centre of town. The position of

the municipality or of the group of municipalities will weigh heavily on the future of local social and marketing networks and on the possibilities for inhabitants to be supplied by producers via local markets or mass marketing.

- By favouring or otherwise the development of a system of local products sold in baskets, formalized by contract between a group of consumers and one or several producer(s) (AMAP[7] and similar associations). This support may take different forms: putting a municipal room at the consumer's network disposal for the (vegetables) baskets distribution, or facilitating hiring in the association or in the network of consumers associations (regional council plan "springboard jobs", only in favour of associations, and that finances the major part of the salary).

Institutional catering is also an important issue considering the number and the regularity of meals to manage. For schools and secondary schools that possess their own inside caterers, the problem lies in public invitations to tender where a proximity clause is not provided for in the choice of food providers. This difficulty is frequently overcome by choosing for instance very characteristic products in the terms of reference that exactly fit with local productions. For elementary schools that do not have inside caterers and that have meals delivered, the choice of the bread can be extracted from the principal invitation to tender. Some school boards situated in the Île de France, have actually chosen the Organic Bread of the Île de France. Here again, the level of communication on the origins and proximity of products within the school enhances or minimizes the educational impacts of such initiatives and the connections made with the surrounding area and its producers.

Policies favouring the integration of agriculture in local cultural heritage and governance: enhancing the values of agriculture, celebrated by urban dwellers

These kinds of policies are shared between the different levels of local authorities (Duvernoy, 2005) and essentially they use and promote the other political actions that we have outlined in this paper. The general idea is that agriculture is largely used by many local authorities to root and to characterise their identity, however the enhancing of agricultural values, or the celebration of agriculture in the case of (grape) harvest festivals for instance, is mostly carried out with the marginal involvement of farmers.

[7] AMAP: Association pour le Maintien de l'Agriculture Paysanne: Association for preservation of local community-based farming

For instance, although they were consulted during the conception of all fifteen educational panels regarding agriculture in its natural, economic and social environments, local farmers were not present, at the inauguration of the agricultural interpretation path of Plateau Briard in 2005 unlike local associations and elected people. Neither did the Chamber of Agriculture of the West Île de France support the regional photo competition on agricultural landscapes that was organised in 2004 by the region and the IAU[8] which was very successful and reached a wide and uninitiated public. The question of the participation of farmers in the integration of their own cultivated lands history and expertise in the local cultural heritage is particularly meaningful in the ten "territoires agri-urbains" (agri-urban areas) that have arisen in the "green belt" of Île de France, i.e. between 10 and 30 km from the inner Paris ring (De Biasi, Pujol, 2005, Poulot, 2008). Of these the "Green Triangle of the (five) market gardening towns of Hurepoix", 15-20 km south of Paris, is probably the one which has gone the furthest in a governance experiment involving the three families of actors set out in the Introduction. The administrative board of the Green Triangle association is organised into three colleges: elected people, farmers (one representative per municipality, and each kind of crop produced in the entire area has to be represented) and "other agricultural area users" federated in associations. It is this civil society college that is the most difficult to set up. These "agri-urban areas" are still very young and often suffer from a lack of leadership and projects. They can't therefore give already a reproducible and long term experience on farmers involvement in local governance. They remain pilot projects for arising areas, set up in the name of agricultural entities that some associations, elected people and/or farmers have decided to safeguard in the face of the peri-urban landscape and falling living environment standards (Table 5).

Local levels	Means	Objectives	Resulting proximities and connections created
Municipalities	• Municipal journals • Cultural heritage festivals	• Local identity and activities • To root the municipality in local (agricultural to a great extent) traditions	• Culture and local roots in common
Communauté de communes or d'agglomération	• Paths, educational panels • Support for rural or outer suburb environment preservation associations • Websites, agricultural charters	• Awareness, adherence, respect • For associations: to have agricultural interlocutors • Lasting connections with the agricultural world	• Acknowledgement of a local and shared responsibility on the part of users in agricultural areas. • Decision making with agricultural world through local associations or charters.

[8] Institut d'Aménagement et d'Urbanisme de la Région Île de France

Local levels	Means	Objectives	Resulting proximities and connections created
PNR	• Communication • Festivals, paths • Support for local breeds • Support for local processing of agricultural product • Support for breeds or plant Conservatoires	• Identification, cultural assertion, local pride. • To get local products available that symbolize the area • Opening of agricultural areas to inhabitants and hikers	• Established links between local identity, agricultural activities, landscapes and products • Cultural appropriation of agricultural area by inhabitants
Departments (Conseils généraux)	• Landscapes Atlas (Seine et Marne et Yvelines) • Call for projects «Peri-urban agriculture and innovative and environmentally friendly practices»: 30 k€ per project • Agenda 21 (Essonne): sustainable agriculture is one of the five priorities in the financial and social innovation plan.	• Understanding of area • Municipalities, school, research, associations and professional chambers working together on cultivated land protection, innovative agricultural practices, direct selling, diversification, training. • To integrate agriculture in a global and participative policy of sustainable development	• Landscape used as a federative (or conflictual) subject of study between different users or observers of the area. • Networking of actors working for qualitative progress of agriculture and of its impact on surrounding area. • De-compartmentalization of agricultural questions
Regional council (Conseil régional)	• Paris International Exhibition for Agriculture • Joining PURPLE1 and Terres en villes (lands in towns) networks • Rural and agricultural Atlas of Île de France • Photo competition on regional agricultural landscapes • Support for agriurban programmes, Leader and National rural development programme (FEADER)	• A showcase of Île de France agriculture equal to its ambitions of a world economic metropolis and top tourist destination. • Networking of regional agricultural actors with other metropolis • Regional assertion of an agricultural and rural cultural heritage	• A showcase of Île de France agriculture equal to its ambitions of a world economic metropolis and top tourist destination. • Networking of regional agricultural actors with other metropolis • Regional assertion of an agricultural and rural cultural heritage

[1] Peri-urban Regions Platform Europe

Table 5: examples of policies favouring the integration of agriculture in local cultural heritage and governance.

Appraisal of the five political approaches and of the resulting proximities

The following are some key issues on the different policies that have been tackled in this document:

- Land ownership policies: the fact that the SDRIF covers the whole region (uniquely in France) creates a common framework that places the agricultural area in the heart of an overall, negotiated and partnership project. The municipalities have a formal responsibility through the choices made in their PLU, but also through their efforts as an individual municipality or in cooperation with other municipalities, to bring together agricultural supply and social demand, notably through land ownership interventions: support for food-producing farms in the setting up and opening of agricultural areas to local dwellers by paths for pedestrians, cycles, horses…
- Policies supporting agricultural production structures: essentially investment support is at stake, whose purpose is to correct CAP or too exclusively agricultural aims and to diversify farms in order to open up them to their surrounding area. The regional budget allocated to agriculture is around €10 million, and the CAP subsidies shared between farmers are around €280 million. It is our understanding that only the very targeted support (such as aid for organic farming) or the support reserved for the productions the less helped by CAP have an actual impact on the strategic and production choices of farmers.
- Product quality and agricultural environment quality policies: these combine investments and operating support for farms, especially to favour the start of new practices. Improving the quality of products and the environment restores a sense of responsibility and pride among the farmers involved, which constitutes a true breeding ground for the desired connections and relations with local populations and their elected people.
- Marketing policies: these policies are situated at the core of our conceptual triangle (Figure 1) as they rely at the same time on the attractiveness of agricultural products, on their appropriation by local areas as a local asset, and on the choice of consumers who can decide in a precise place to buy a product that may be more expensive than the standardized equivalent. According to the area, the most difficult aspect will be to find the producers who are likely to meet with local social expectations, or on the other hand to find close or faraway outlets for a local production with added value, (possibly through labels).
- Policies favouring agriculture integration in the local cultural heritage and governance: peri-urban agriculture lands up in the core of new re-appropriations of peri-urban spatial entity by dwellers on the one

hand and in the core of a new acknowledgement of the density of rural and agricultural cultural heritage by policy makers on the other, most of the time without any initiative required on the part of the farmers (Fleury, Guiomar, 2001). The poor participation of farmers to the responses of associations or local authorities to those arising interest will not prevent these trends from happening but will minimise their impact while the other anchorage points of agriculture with land and inhabitants show also cultural blocks: immutability of land ownership, productions, landscape, and market networks. Reconnecting agriculture with the surrounding area through an acknowledgement of its cultural heritage is often a prerequisite for local policies to be taken a step further. Unfortunately this is often the alpha and omega of many of these local agricultural policies.

Conclusion

It clearly appears therefore that in certain areas, and particularly in peri-urban areas, any intention of bringing the agricultural community, inhabitants and local authorities closer together should not overlook any of the policies that are set out in this presentation. These strengthen or weaken one another, even if they are not managed by the same level of authority. This is the main issue when striving for a local agricultural coherence in a region like the Île de France that is strongly influenced by the CAP and by State interests. If the weakness of one of these policies or public actors can rub off on all of them, the opposite can also occur: a mere municipality, association or farmer's family, with for instance the intention of developing agricultural employment or opening a farm products market can lead other actors or sectional policies in its wake and create the proximity and quality supply and demand. Wherever the initiative comes from, the sustainability of the peri-urban agricultural is at stake in the dynamics of the interactions between inhabitants, elected people and producers' involvement, with more or less tension, in a word in the emergence of a "pays", a local entity.

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Food for the cities: urban policies and the role of farmers[1]

Riassunto Le attuali dinamiche dell'agricoltura peri-urbana risentono di una combinazione di processi, in particolare l'evoluzione dei sistemi agro-alimentari e lo sprawl urbano, che stanno determinando delle trasformazioni in termini di configurazione dell'uso del suolo agricolo.
Il presente contributo vuole illustrare e spiegare come tali processi stiano realmente confinando l'agricoltura in zone sempre più distanti dalla città, con importanti conseguenze sulle produzioni – sia sulle scelte produttive sia sulle modalità di produzione – e sulla distribuzione e localizzazione delle funzioni commerciali.
Contrastare la progressiva frammentazione del tessuto agricolo di frangia e la suburbanizzazione della distribuzione alimentare rende necessaria l'implementazione di una pianificazione urbana che contempli la rilocalizzazione della produzione, della distribuzione e del consumo del cibo.

Résumé Les dynamiques actuelles de l'agriculture périurbaine sont influencées par une combinaison de processus, notamment l'évolution des systèmes agro-alimentaires et les lotissements, qui provoquent des changements importants de configurations de l'usage agricole du sol.
Ce papier illustre et explique comment ces processus amènent à une ségrégation de l'agriculture dans les secteurs les plus éloignés de la ville, avec des effets importants d'une part sur les choix de production, de l'autre part sur les systèmes de production. De plus, cette ségrégation influence la distribution et la localisation de fonctions commerciales.
Contraster cette fragmentation du tissu agricole et la sub-urbanisation de la distribution alimentaire demande la mise en œuvre d'une planification urbaine tenant compte d'une nouvelle localisation de la production, de la distribution et de la consommation des produits agricoles.

Introduction

In recent years, rural-urban relations have become increasingly difficult, because of new material and immaterial flows led by several elements: European territorial policies, especially regional enlargement[2] and cohesion policies, shifts in agriculture, and valuing of rural areas as recreational places (OECD, 1996; 2006).

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[1] Gianluca Brunori and Stefano Orsini – University of Pisa (Italy)

[2] Regional enlargement policy, through investments in infrastructure and improvements in the accessibility to remote areas, might in principle foster, labour markets and economic growth. The expression "regional enlargement" was first used in relation to Swedish policy (ESPON, 2006).

Territorial policies and developments in communication have on the one hand facilitated the accessibility of marginal areas, while on the other hand they have facilitated urbanization and the urban influence on the nearby countryside (EEA, 2006).

The fringe is often a place of conflict and is characterized by a mixture of lifestyles and by the countryside adopting urban patterns (Allen, 2003).

For several years the effects of new technologies, both on communication and production, have involved various sectors of the economy, and have "englobed" agriculture into the modernization model (Lutman and Marsch, 2007). Agricultural policies have fostered industrialization and the standardization of production. Only recent CAP reviews have been promoting integrated rural policies, although successful rural development is not the immediate result of the second pillar of the CAP, but is complex, involving local communities and the consolidation of the networks of the various actors.

In terms of social and spatial configurations, developments in infrastructure development and new mobility patterns have been shaping the localization of businesses as well as consumption and purchasing models. The study of rural-urban relationships and land use changes may be useful to understand the role and importance of territorial policies.

It is clear that urbanization is a real trend and is difficult to restrain; any idea of sustainable development requires thinking about the future of cities. At a local level, a “sustainable” city ensures a better life for its citizens (Véron, 2006). Therefore improvements in housing and transportation systems, food relocalization strategies, service accessibility, which is becoming an issue not only for rural areas, are ever more important. However sustainable cities are also a global issue, which entails containing urban pressure. In addition new relationships and a balance between cities and rural areas are needed given that they are subject to diverse flows (food, culture, work, etc.) and billions of people live there.

In this article, some of the factors that play a key role in changing rural-urban relations, and the main effects on peri-urban areas are analysed. In particular we focus on the preservation and development of peri-urban agriculture, as well as how a good marketing plan for food distribution in cities can contribute to cheap and differentiated food accessibility, keeping down the emergence of urban food deserts in line with the principle of food democracy.

Agricultural land use patterns

Peri-urban agriculture dynamics are influenced by a combination of global and specific factors: the technological innovation and globalisation of the food system on the one hand, and problems and opportunities that are typical of peri-urban agriculture on the other.

A review of various land use patterns, through J. Heinrich von Thünen[3] (1826) and R. Sinclair (1967) models reveals how spatial farming localization changes in connection with city patterns and land use.

The patterns that are described below are simplified, assuming some abstractions such as perfect competition, the same soil fertility, the city centre functioning as a lone market city and so on.

However, there are also other factors, which did not exist in von Thünen times, which contribute powerfully to productive and business activities localization, and also to consuming and purchasing techniques.

The development of new technologies, after von Thünen's time, has reduced the importance on agricultural land use of the distance from the market. For example, transportation and conservation techniques have reduced logistical costs and increased the weight of transport and conservation in terms of the total value of the products. These processes have removed agricultural activity from the local and social context, and have thus strengthened the "remote control" of multinationals.

In other words, the food industry and the establishment of the modernization paradigm have favoured the delocalization of agriculture, and in some ways they have facilitated the fragmentation of the fabric of the socio-economic connection between urban and rural areas.

Von Thünens model and land rent

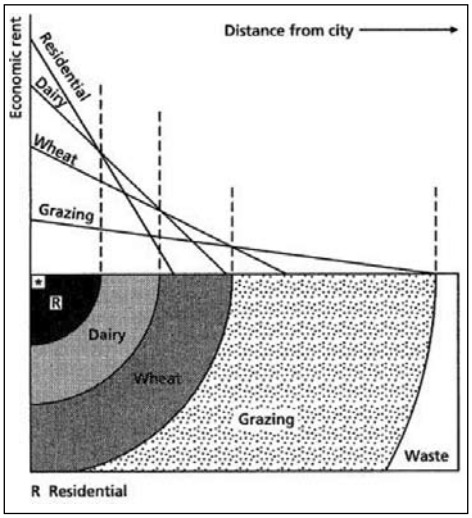

Figure 1: agricultural land use in relation to distance from the city centre and transportation costs.

The first attempt to elaborate a theory of location economics was connected to a model of agricultural land use, and was developed by von Thünen.

According to his theoretical model, the city market is surrounded by concentric rings of agricultural activity. Land rent, or "location" rent, decreases the further away from the market it is. Consequently, the highest value crops (fresh milk and dairy products, vegetables, fruits) are grown nearest to the market, because here farmers are willing to pay more for the land than farmers from the external rings, thanks to lower transportation costs due to

[3] Johan Heinrich von Thüenen (1781-1850) was a German economist and provided the first systematic theory of economic location in his book Der Isolierte Staat (The Isolated City), published in 1826.

their proximity to the city centre.

The main ideas of the theory are:

- location depends on land rent;
- land rent varies with transport costs and the perishability of products;
- land rent decreases with increasing distance from the city centre.

From land rent to urban and rural rent

In recent years, many rural areas have been altered by the growth of cities. The urbanization of the rural, extra-urban expansion, urban sprawl: these expressions refer to a transformation process that led many rural areas to be perceived and represented as parts of cities (Marsden, 2006; Murdoch, 2006; Perkins, 2006).

Urban sprawl[4], which initially affects a peri-urban fringe, has also been influencing the organization of agricultural land use. The distance from the market is no longer a key factor. Urban encroachment has become a very important element that has led to agricultural land use patterns that are quite the reverse of what von Thünen outlined in his spatial model (Sinclair, 1967).

These changes have led to the marginalization of farming in land areas that are usually far from the city and also less productive; thus there has been a transition of the first sector to a more costly and more demanding agricultural model in terms of inputs (water, fertilizers, etc.). This has caused higher environmental costs.

Urban growth has been changing land use in the fringe: urban sprawl and new property rents have influenced the production trends of the primary sector, moving the use of many land areas from farming to building designation, thus reducing the number of fields available for food production.

Globally, these dynamics have caused a drastic decrease in the availability of agricultural land, and, consequently, an intensification of farming in the face of an increasing worldwide demand for food. Therefore the preservation of agriculture is an important current issue, as well as the containment of urban sprawl. This sprawl is the result of new investments in infrastructure that irreversibly encroach on the landscape. It is also the result of many political and economic factors (the low price of agricultural land, competition among municipalities, the idea of development based on urban growth, etc.) rather than a rational long term strategy (EEA, 2006).

Another maybe less apparently, is the desire to live outside the city, which

[4] Urban sprawl is the physical pattern of the low density expansion of urban areas under market conditions mainly into the surrounding agricultural areas. Sprawling cities are the opposite of compact cities, full of empty spaces which indicate the inefficiency in development and highlight the consequences of uncontrolled growth (EEA, 2006).

is strictly connected to the *rural idyll* and the *amenity property* ideal, now the privilege of wealthy people. The results have led to the post-productive countryside (Lowe et al., 1993) and the "commodification of the countryside" (Perkins, 2006). This has led to the transformation of many rural and peri-urban countryside areas in terms of social relations and land use patterns, as well as agro-environmental resources and the value and significance of rural rent. The peri-urban and rural landscape have become consequently often more homogeneous, although the construction of semi-natural or pseudo-natural environments, where the agriculture as the food production activity, has had a marginal significance (Marsden, 1999).

Effects on peri-urban agriculture

Peri-urban agriculture, according to Fleury and Donadieu (1997), is the agriculture of urban peripheries, regardless of city size, tillage and production techniques.

Farmers of peri-urban areas, as already mentioned, have to cope with both development of food systems and land consumption.

The proximity to cities makes farmers vulnerable to expropriation by the private sector, which is self interested in transforming agricultural land into building land, which involves the intensive use of natural resources and the parcelling out of farming areas.

The resulting changes in agricultural trajectories can be diverse:

- the abandonment of agricultural activity, at least in terms of it being an economic activity;
- pluriactivity, such as recreational services linked to agriculture (e.g. agritourism) or off-farm employment opportunities;
- urban-oriented production and marketing (selling direct, CSA, farmers market, etc.).

Regarding the last point, reinforcing an awareness of the value of local resources such as landscape and culture (symbolic relocalization) and encouraging the implementation of actor-networks (relational relocalization) are necessary in order to permit an effective physical relocation of food in its different phases (Brunori, 2007).

In this process, the territory is the result of an interaction between natural capital and social construction, framed around three interdependent levels – lived space, perceived space and conceived space – (Lefebvre, 1974; Harvey, 1989; Brunori and Casciotti, 1998), involving producers, consumers, policy makers, and city and country dwellers in general.

Peri-urban agricultural adaptations – abandonment, diversification, etc. – depend on several factors, such as the adaptability of farmers, the local context, urban policies. The involvement of local community and the implementation actor networks, on the model of rural development, and the

participation of inhabitants are very important in order to enable peri-urban agriculture to consolidate.

The role of urban and territorial policies

The fragmentation and erosion of the peri-urban agricultural structure has an impact on the location of farming activities. Similarly, infrastructures and mobility development, which are becoming consolidated in developed countries, influence business localization and the models of consumption and purchasing.

The Future Foundation and the Centre for Rural Economy (CRE) have been commissioned by Defra to conduct a 'Rural Futures: scenario creation and back-casting' project. On the basis of trends in territorial policies, they imagine scenarios around diverse characteristics and the roles of agricultural futures, and regarding the commitments rural futures would have to meet in terms of changes in territorial and urban patterns.

According to Defra's study, the variables that are most likely to influence the future countryside are:

- future land use policy and planning;
- the extent that society preserves and fosters the distinctiveness of the countryside.

The three scenarios imagined in the study are represented along the two axes in Figure 2.

If planning and land use policy do not counter urban sprawl and peri-

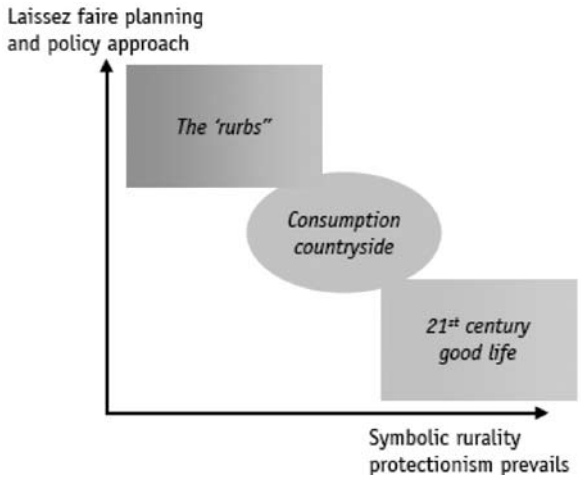

Figure 2: the three scenarios of rural futures in 2024. The "central" scenario, the "Consumption Countryside", is considered to be the most likely outcome, while "The Rurbs" (i.e. rural suburbs) and the "21st Century Good Life" are alternative scenarios characterized by stronger planning and liberal planning policies respectively (Future Foundation and the Centre for Rural Economy, 2004).

urban agriculture erosion, extensive agriculture will only be feasible in marginal areas far from metropolitan centres (Future Foundation and the Centre for Rural Economy, 2004).

In this case, peri-urban agriculture will be preserved and developed by small farms by observing urban oriented production and marketing (selling direct, diversifying commodities, etc.). However, the relocation of food also requires such a powerful cultural policy (community agriculture, urban and school gardens, health prevention, schools meals, etc.), which require the involvement of civic participation.

Conclusions

The loss of agricultural land in the rural-urban interface has been shaping the localization of farming. In addition developments in mobility patterns, which have influenced eating habits in terms of new styles of food consumption and purchase, have had a great impact on food production and retailing locations and methods.

The suburbanization of food retailers contributes to the rise of urban *food deserts*. In fact, the success of the suburban superstore and the decrease in smaller stores located in the centre of cities have reduced the access of disadvantaged people to healthy, fresh and cheap food, due to difficulties of their means of transport.

The importance of the consolidation of food democracy in cities suggests the introduction of food policies within urban policies, from the early phase of production to food retailing and consumption: planning of the market, cultural policy, policy for the underprivileged, civic participation and so on. If urban encroachment continues, peri-urban agriculture will possibly be represented by small farms producing high value food, such as the von Thunen' representation.

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Peri-urban agriculture and its actors

Introduction[1]

The expansion of cities towards agricultural land produces multi-actorial contexts with a high level of differentiation. In terms of urban actors, the peri-urban context is characterised by outliers, from workers that live in the city but work in industrial settlements in fringe areas, to the consumers of direct sale in peri-urban farms or farmers' markets due to *relocalisation* and the evolution of *alternative* food chains. Other actors are represented by new residents who have decided to live in rural areas that are considered as having a higher quality of life or by those who are in search of lower living costs (i.e. the price of rental homes is much lower in many peripheral areas). At the same time there are rural actors who are not exclusively devoted to agricultural activities, for example many rural actors may work in peri-urban industrial settlements or in the city. However, they often conserve rural culture and in many cases work in agriculture part-time. This situation produces different perceptions of the dynamics of land transformation and a different evaluation of the drivers of transformation, and of their effects on agricultural management. This differentiated social setting thus produces multiple and different societal demands, and multiple and different land uses that need to be satisfied by new ways of planning. Peri-urban agricultural areas are neither really rural nor urban: and this leads to the question to what is the appropriate sectorial planning required? What are the most relevant stakes? And lastly who are the stakeholders that express local interests? There is probably a need for a much more multi-actorial perspective to tackle this complex situation. It is therefore important to support local participation in order to highlight the stakes of the local community and, at same time, to register the stakes of newcomers or new users of this space. The final aim should be to guarantee the sustainable development of any changes.

Similarly peri-urban agriculture may be considered as capable of satisfying multiple societal demands, both defending the need for residual communities linked to the previous exclusive agricultural land use and responding to new societal needs. These new needs are expressed by newcomers and by the proximal urban community. Some implicit functions, commonly fulfilled by agriculture, are now highlighted by explicit needs such as landscape, the environment, health and local food services.

This situation can lead to new opportunities for farmers and a higher appreciation of the role of agricultural land use. In this regard the quality

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[1] Mariassunta Galli - Scuola Superiore Sant'Anna (Italy)

of urban planning in peri-urban areas depends on the ability to preserve farming; and the quality of agricultural planning depends on the capacity to enforce the synergy between *urban demands* and *agricultural responses*.

Two main topics are dealt with in this chapter.

Silvia Novelli, rural economist at the Study Centre for Hill Rural Development, and Prof. Bruno Giau, rural economist at the Department of Agricultural, Forestry and Environmental Economics and Engineering, University of Turin, propose a case study aimed at identifying strategies to counteract the transformation process of the surrounding hills of Asti. Their focus is on enforcing the multifunctional role of peri-urban farms.

Salma Loudiyi, Sylvie Lardon, Laurent Lelli, rural geographers at UMR Metàfort, Clermont Ferrand, start with a case study applied to the inter-municipality of Volvic Sources et Volcans. They propose an examination of the needs in terms of planning and institutional coordination for governing peri-urban agricultural areas.

Conservation, enhancement and promotion of the greenbelt land around Asti: a peri-urban Agricultural Park[1]

Riassunto Negli ultimi anni l'area peri-urbana della città di Asti è stata oggetto di profonde trasformazioni territoriali e paesaggistiche. In risposta a tali sollecitazioni, in sede locale è nata la proposta di costituire un Parco Agricolo per la tutela e la valorizzazione della cintura verde della città. In prima istanza è stato realizzato uno studio mirato a definire strategie specifiche per il territorio in oggetto e a indicare una forma organizzativa e gestionale in grado di promuovere le azioni di sviluppo individuate. Lo studio è stato condotto ponendo l'attenzione sul territorio, da una parte, e sui suoi principali attori, cioè le aziende agricole peri-urbane, dall'altra. I risultati della valutazione hanno permesso di ipotizzare un percorso credibile di strumenti organizzativi di partecipazione ed intervento, nonché di definire un programma di interventi concepiti secondo una logica che combina azioni diverse (integrate), calibrate sul territorio e mirate a precisi obiettivi operativi.

Résumé Dans les dernières années la ville d'Asti a présenté des modifications territoriales et paysagères importantes. Face à ces changements, la municipalité d'Asti a souhaité conserver et valoriser le territoire proximal à la ville au travers de la constitution d'un parc agricole. Dans un premier temps, cela s'est concrétisé dans le financement d'une expertise ayant comme objectifs l'individuation des stratégies et des actions de conservation pour ce territoire spécifique ainsi que la définition d'une forme d'organisation et de gestion capable de promouvoir les actions de développement identifiées. Cette étude a porté sur le territoire d'une part et sur ses acteurs principaux, les exploitants périurbains d'autre part. Les résultats obtenus ont alimenté l'identification d'outils pour la participation et l'intervention. De plus ils ont aidé à la définition d'un programme d'interventions combinant des actions diverses (intégrées) adaptées aux différentes parties du territoire et traduites dans des mesures précises.

The Agricultural Park of Asti

Deep in the heart of the Monferrato hill region, the city of Asti is noted for the rural hillsides surrounding the town. Natural and anthropological elements combine harmoniously, and the rich landscape has been moulded by the balanced human intervention on natural resources (Figure 1). Over the centuries, human activity has been accompanied by the widespread diffusion of a rural, civil, and religious architecture of great historical-artistic importance and, more generally, by the existence of an ancient settlement on the hilltops.

[1] Silvia Novelli and Bruno Giau - Research Centre for Rural Development of Hilly Areas (Italy)

Over the last few years, the widespread desertion of marginal lands, the adoption of new cropping systems, and housing/infrastructure expansions have all produced profound transformations in the features of this area traditional countryside. For these reasons, the town council has decided to set up an Agricultural Park to conserve and enhance the surrounding rural territory. This kind of initiative (usually implemented in large metropolitan areas, such as the South Milan Agricultural Park), takes on particular characteristics in Asti, namely:

- its mid-size dimensions;
- the concurrence of both planning and administration territorial domains (the area of the park and the territory of the municipal district);
- the area's strong agricultural vocation.

Figure 1: the city of Asti and its hilly surroundings.

The Rural Development Programme (RDP) for the Piedmont Region 2007-13 and the National Strategy Plan (NSP) for Rural Development 2007-13 classify the Asti Municipality, together with other provincial capital municipalities of over 150 inhabitants per sq.km, as *Urban poles*. In spite of this administrative definition, Asti boasts the highest number of farms for a provincial capital in Piedmont (2,491 according to the results of the 2000 Agricultural Census). Farmland represents 68.2% of the entire territory of the

municipality[2]. These farms, which are mostly non-professional, are located in an area that suffers from considerable land fragmentation. Approximately 50% of these farms have less than one hectare of UAA (Utilised Agricultural Area) and the average TAA (Total Agricultural Area) of peri-urban farms is 4.2 ha, considerably less than the regional average (12.6 ha) (ISTAT, 2000).

The importance of the agricultural sector in territorial terms is accompanied by a strong sense of affiliation of the town's inhabitants with the green belt, which they consider as their *very own*. This aspect is not generally found in large metropolitan areas where the countryside is often viewed passively, as a place to be enjoyed regarding products and services but without active participation.

However, the general situation is also influenced by some conflicting factors (Figure 2). On the one hand, the town's inhabitants have started to view their surrounding countryside in a less superficial way; on the other hand, urban growth represents one of the principle threats for peri-urban agricultural areas, with all the typical dynamics and effects of metropolitan contexts. The expansion in residential building activity, particularly along main road axes, and the increasing number of new business infrastructures in the most exploitable zones (especially commercial and agricultural warehouses) lead to the loss of agricultural and forest land, and irreversibly reduced the landscape and cultural heritage of the area, thus limiting its opportunities for future sustainability.

Advocates of the Park project have pinpointed the possibility of using the local landscape and cultural heritage for commercial means as one possible way of minimizing the threat of urban sprawl and of encouraging the area's natural or traditional vocations. This strategy can be implemented by encouraging multifunctionality in agriculture and helping the production and use of its outputs[3] (diversified marketable goods and services, and environmental, landscape and social positive externalities).

In these terms, productive agricultural activities can create forms of alliance between the city and the country, even when economic factors should theoretically render them expendable - they become necessary and important in protecting the landscape and providing new marketable goods and services. Such alliances are useful in defining new policies for the development of the city, which include the countryside. This theory is based on the hypothesis that the sustainability of a city also depends on the environmental, landscape, and productive quality of the surrounding countryside.

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[2] The incidence of Total Agricultural Area (TAA) compared with the total area of the municipality is similar to that of the other provincial capital towns (almost all in the plan), except for Alessandria (91%) and Torino (55%).

[3] The key elements of multifunctionality are: *i)* the existence of multiple commodity and non-commodity outputs that are jointly produced by agriculture; and *ii)* the fact that some of the non-commodity outputs exhibit the characteristics of externalities or public goods, with the result that markets for these goods do not exist or function poorly (OECD, 2001)

Figure 2: strengths and dangers in the Asti area. Above, traditional farming landscapes and the possibility of using greenbelt land for leisure activities; below, the spread of commercial and industrial warehouses, and new residential development projects.

In view of these considerations, the Local Governing Authority has laid down some guidelines for the protection and enhancement of the city's greenbelt, with the principle aim of implementing multifunctionality on local farms and improving the usability of the Park.

Research aims and methodology

This study was mainly carried out in the context of rural development policies and is consistent with the financial and executive tools available at a regional level.

The main research goals were:

- to outline the requirements of the Park area and lay down the main objectives for its conservation and enhancement;
- to analyze strategies and actions capable of achieving the main objec-

tives and to single out the legislative and financial instruments necessary for their accomplishment, with specific reference to promoting production, and facilitating the use, of multifunctional goods and services;
- to define an organizational and managerial structure for the Park in order to promote and execute the strategies and actions indicated.

The area under study was the greenbelt of Asti, which is subdivided into thirteen rural hamlets[4].

This study was divided into two steps:
- Step 1: analysis and evaluation;
- Step 2: definition of a management strategy for the Park.

The *analysis and evaluation* phase set out to re-organise the rural hamlets into homogeneous action areas and to define the requirements and specific functions of each. This step involved an analysis of both the territory and its main land managers, i.e. farmers (Figure 3).

The territorial analysis set out to describe the local context. The main requirements of the Asti greenbelt (to protect and increase its value) were examined. In addition, production conditions, economic/settlement systems, infrastructural networks and town planning instruments of the municipality were all closely looked at.

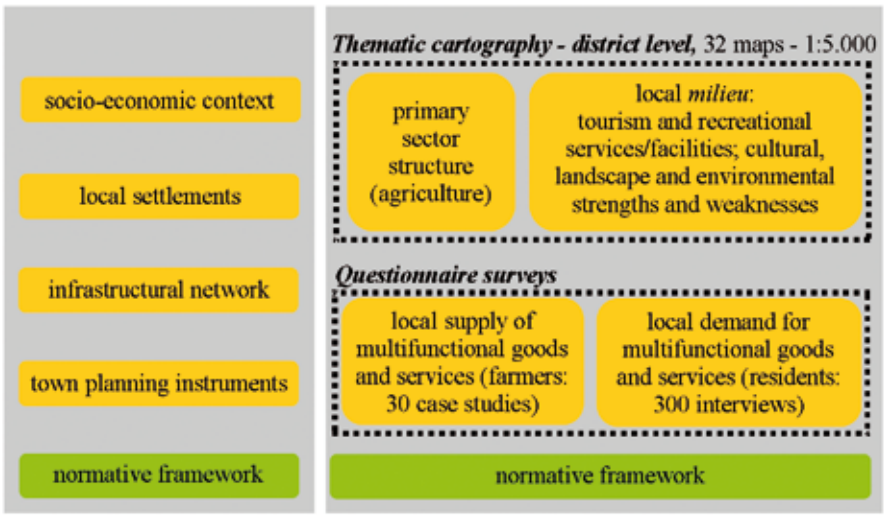

Figure 3: research fields and activities in Step 1 (analysis and evaluation).

[4] In the past, the rural hamlets surrounding the city of Asti were completely autonomous municipalities. In the 1930s, the thirteen hamlets became part of the city of Asti, forming a sole municipality.

The analysis of the multifunctionality of the farms was intended to assess both the possibilities and limitations of peri-urban farms with regards to the supply of multifunctional goods and services.

Firstly, the main activity (agriculture) was analyzed both from a structural point of view and in relation to other important activities connected with rural development (particularly the tourism-recreational industry), to the local surroundings and to their cultural, landscape and environmental attractions. Step 1 principally consisted of two surveys conducted via questionnaires, intended to assess: i) the opportunity for farmers to provide diverse goods and services, and whether and how they exploit this opportunity; ii) the habits/preferences of Asti residents regarding both their current and potential future use of these goods and services.

In order to translate the emerging results of the survey into practical guidelines for action in both spheres of analysis (town planning and multifunctionality of farms), the regulatory frameworks (regional, national or European) were also studied.

Using the results of the evaluation, Step 2 of the research was carried out, with the aim of identifying the main objectives, strategies, and actions for the Agricultural Park.

The results of the research were shared with Asti's Local Agenda 21 Forum. During the Forum, a specific topic group was developed to focus on the Agricultural Park. The research team worked alongside the activities of the facilitators and topic group leaders as technical-scientific consultants and participated in the group meetings.

The information on the Agricultural Park collected by the topic group (using a joint programming approach) was integrated with the preliminary results of the research project and contributed to defining a shared strategy for the Park.

The logical framework of research results

Using the information collected in Step 1 of the research project (*analysis and evaluation*) as a starting point, an organizational and managerial strategy for the Park was defined (Figure 4).

Firstly, the rural hamlets were grouped into three homogeneous sub-areas based upon a variety of socio-economic and environmental parameters: agricultural sector structure, naturalness, community services, touristic and recreational services/facilities, leisure time preferences of residents, and human influence (Figure 5). The definition of the sub-areas is postulated to reflect the conditions underlying attractiveness for local tourism and the potential of local farms in terms of multifunctionality.

A descriptive file was written for each sub-area, containing: the local *strengths* and *weaknesses*, the *typology of fruition* for which the area is prin-

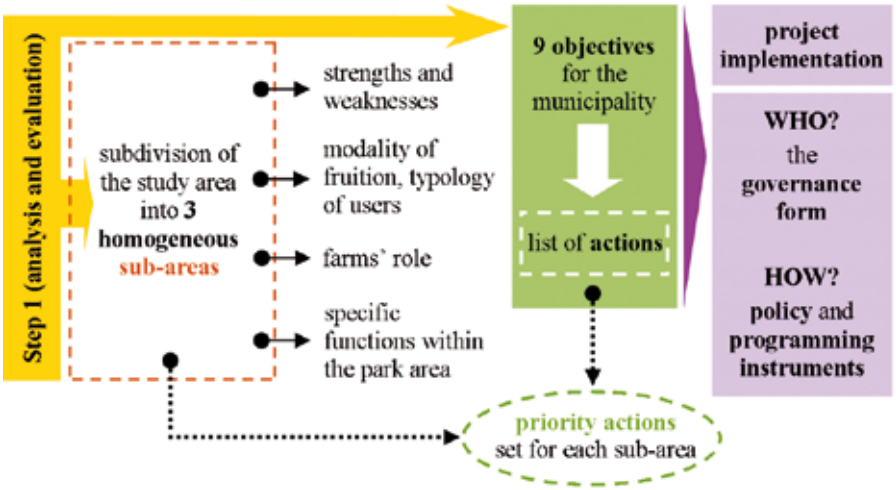

Figure 4: the logical framework of Step 2 (definition of a management strategy for the Park).

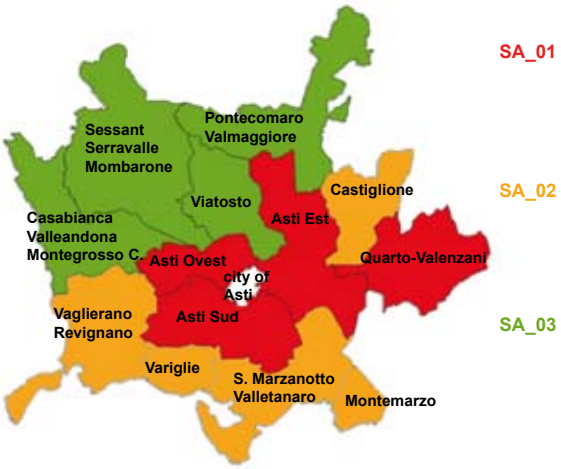

Figure 5: classification of the rural hamlets in Asti into homogeneous sub-areas.

cipally endowed, the *potential role of farms* in relation to the supply of multifunctional goods and services and the specific *functions* of the area as concerns the Park.

The next step was to define the operational targets for the Park (Table 1) and a suitable action plan was assigned to each target. Actions were prioritized for each sub-area in order to fulfil local requirements (an example of actions and priorities is shown in Table 2).

Finally, two essential issues for project implementation were dealt with:

1.	Protecting the rural-urban fringe from urban sprawl
2.	Facilitating/expanding the agricultural production of marketable non-commodity goods and services (on-farm diversification) and improving the competitiveness of traditional agriculture
3.	Promoting the production of positive agricultural externalities (e.g. landscape)
4.	Ensuring vocational training and information updates for local farmers
5.	Promoting and improving the marketing of local agricultural products
6.	Improving access to the countryside and recreation (both at farm and public area levels)
7.	Ensuring land and landscape maintenance and repair
8.	Promoting and supporting cultural and recreational activities and related services
9.	Providing information and promotional activities on the Park's cultural, environmental and landscape heritage and the services offered

Table 1: strategic objectives set out for the Agricultural Park.

5 – Promoting and improving the marketing of local agricultural products			
Actions	**Priorities**		
	SA 01	*SA 02*	*SA 03*
Creation of a network of farms close to the city which sell directly via ad hoc routes and itineraries	X		
Creation of multi-farm shops which sell local products in the outlying hamlets of Asti		X	X
Diffusion of knowledge and information about local products and the farms which supply them	All		

Table 2: an example of actions and priorities (objective 5).

- the most suitable form of governance for the Park;
- the policy and programming instruments at European, national, and regional levels, from which the necessary resources can be drawn on to achieve the proposed goals.

The Agricultural Park implementation strategy

Two closely-related aspects need to be considered for the implementation of the Asti Agricultural Park project: the role of the form of governance feasible under current regulations, and the applicable policies of public intervention.

Since the institution of an Agricultural Park in Asti constrained by regional law was not one of the intentions of the promoter and since the Leader approach can not be applied to *Urban poles*, a need has arisen to define a looser (yet still efficient and effective) form of governance for the greenbelt of the city.

To this end, the laws currently in force on rural development offer several possibilities:

- Council Regulation (EC) No 1698/2005 Art.59 states that support for skills-acquisition and training with a view to preparing and implementing a local development strategy shall also cover the implementation by public-private partnerships other than those defined in the framework of the Leader initiatives (Local Action Groups).
- the Rural Development Programme (RDP) for the Piedmont Region 2007-13 introduces the notion of 'integrated actions'. These integration modalities may refer to measures of a single Axis or a combination of measures of different Axes, working towards a specific objective, and may concern groups of beneficiaries, entire supply chains or specific territories (packages of measures for business, integrated supply chain projects and integrated territorial projects)[5]. The regional RDP 2007-13 specifies that integrated actions will be carried out through a collaborative partnership and that the granting of aid to beneficiaries will be subordinate to the agreement as stated in the integrated project.

In this context, the constitution of a public-private partnership is proposed, a local form of governance consisting of a volunteer alliance between different stakeholders[6]. These stakeholders join together in order to devise the development strategy of the Park and to promote long term activities, following coordinated methods depending on their competencies and access to financial resources.

This type of partnership could be established by setting up an Integrated Territorial Project (ITP) for the Asti peri-urban area. This ITP, drawing on the measures of the I, II, and III Axes of the regional RDP 2007-13, should define a package of measures/actions aimed at encouraging the preservation of agricultural land/activities, the diversification of productive activities, and the remuneration of the environmental and landscape services provided by the farms in the greenbelt of the city.

Unfortunately, at the time of writing, the Piedmont Regional Authority has still not issued instructions for operational procedures regarding an integrated approach for the territory. For this reason, two possible ITP versions for the Asti Agricultural Park have been assumed: one is *propositional-strategic* whilst the other is *programmatic*.

Each of the two versions requires the local partnership to play a different role and to have a different set of operational procedures.

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[5] These integration modalities that respond to the different needs of businesses and territories are not an alternative to individual funding applications but are to be used jointly and in complementary fashion at a thematic and/or territorial level in order to improve their effectiveness.

[6] Municipality, Province, Trade Chambers Board, farmers unions, cooperatives and producer associations, farms, banking institutions, etc.

In the *propositional-strategic* hypothesis, the ITP of the Park would restrict itself to providing information on:

- the measures and actions, the packages of measures for the business and for the territory, the forms of intervention, and the beneficiaries, etc. regarded as priorities for the Agricultural Park;
- the synergy and integration of the RDP with other European, national, and regional policy instruments.

In this case, the duties of the partnership should be of a propositional or reinforcement nature. The partnership would furnish recommendations regarding priorities and synergies of intervention[7], in coherence with the operative objectives and the guidelines of the Park. The Piedmont Region and the Province of Asti authorities should take into account the recommendations of the *propositional-strategic* partnership whilst managing the RDP measures and other programs of intervention.

The *programmatic* ITP should be guided, instead, by a strong sense of planning. It should point out some shared projects of intervention (preliminary projects) based on integrated planning, with the aim of maximizing the expected effects of each intervention. Once the ITP has been approved, the draft projects could be transformed into executive projects and targets for funding.

In this case the role of the partnership will be to co-produce the ITP of the Park, ensuring a suitable selection, integration, and functional concentration of interventions achievable within the integrated project framework.

Regarding policy instruments, a table has been drawn up for each of the nine operational objectives of the Agricultural Park, outlining the measures and actions of the various policies (European, national and regional) which apply to the Park.

At a European level, the Development and Cohesion policies (ERDF ROP and ESF ROP of the Piedmont Region) were considered as well as, of course, the RDP 2007-13 for Piedmont Region.

The analysis of the Park's development strategy also took into account the opportunities offered by national and regional policies: the Italian Decree on the reorientation and modernisation of agriculture (no. 228/2001)[8], the State aid policy for activities concerning production, processing, and marketing

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[7] For example, directing public aid towards farms and forest companies that are active in the Park area and most capable of innovation and the promotion of multifunctional agriculture.

[8] The Legislative Decree no 228/2001 introduces conventional instruments that could be defined as "territorial contracts" (article 14 and 15). There are different kinds of contracts: collaborative contracts, promotion contracts and conventions. These agreements are stipulated between the farmers and the public administration: in return for financial aid, the farmers commit themselves to high quality production, to protecting natural resources, to ensuring land and landscape maintenance, hydrogeological assets and so on.

of agricultural products, and both the *sector-based* and *territorial* regional policies.

Conclusions

The results of the research study into Asti's Agricultural Park represent a starting point. The research provides the basic information to initiate the implementation of the strategies, which is outlined in terms of objectives, specific actions and instruments of intervention.

One fundamental factor for the success of the initiative is the participation of both public and private sectors interested in the Park project and, consequently, in the coordination of the financial and implementation instruments that they have access to. A development path for the Agricultural Park using these approaches could be beneficial in terms of both governance and local development.

But the implementation of the Asti project could also generate wider consequences, rather than simply local effects. In fact, the proposed development strategy for the Asti greenbelt could be adopted in other similar situations, provided that certain conditions are respected.

These conditions concern the specific characteristics of the Asti project: the concurrence of the territorial planning sphere (the Park area) with the administrative sphere (the Municipality of Asti), the strong agricultural activity of the area, citizens' knowledge of the greenbelt and its available benefits, and the existing supply of multifunctional goods and services at a local level. These characteristics within a mid-sized territorial context indicate the territorial requirements and characteristics necessary to reproduce the development model proposed for the rural territory of the Asti municipality.

Unfortunately, at this moment in time, the model for the Asti Agricultural Park has not yet been put into practice. So far, the Piedmont Region has not approved any regulatory action on Integrated Territorial Projects (ITP) and no public notification has been published. For these reasons, the legal requirements of the ITP and the probable role of the partnership (*propositional-strategic* or *programmatic*) are still unknown.

However, although on the one hand the regional rural development policies (2007-13) have not yet provided the operative instruments to initiate the implementation of the project, on the other hand the new regional laws seem to open up further possibilities. The new regional law no. 29/2008 (*Location, institution and issue of rural and quality agro-food districts*) states that the *Urban poles*, defined in accordance with the regional RDP 2007-13, may constitute rural districts if characterized by a multifunctional agriculture capable of potentially producing products and services of various types for urban consumption.

The Asti green belt territory seems to fall perfectly within this definition and the chosen development strategy could be used in a rural district plan for the Park area.

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Can agriculture be a territorial resource in peri-urban territories? The case of an inter-municipal structure 'Volvic sources et volcans'[1]

Riassunto Gli autori trattano il ruolo assegnato all'agricoltura nella programmazione e nella pianificazione territoriale nelle aree peri-urbane. Attraverso l'analisi delle strategie di gestione attuate nella periferia di un centro urbano di medie dimensioni (l'aggregazione di comuni delle "Sorgenti e Vulcani di Vovic"), gli autori mostrano come la costruzione del piano territoriale, basato sulla capacità di attrarre attività economiche e di garantire la qualità ambientale, non prenda in alcuna considerazione l'agricoltura. Si sostiene quindi la necessità di considerare l'agricoltura come una risorsa per le periferie dei centri urbani e di sviluppare un'agenda di ricerca sulla governance di tali territori affinché l'agricoltura diventi il volano per lo sviluppo territoriale.

Résumé Les auteurs retracent un parcours de recherche orienté par des interrogations autour de la place de l'agriculture dans les projets des territoires périurbains. A travers l'analyse des stratégies d'aménagement dans une périphérie d'agglomération moyenne en France (La communauté de communes de Volvic Sources et Volcans), les auteurs montrent comment un projet de territoire se construit autour de l'attractivité économique et de la qualité de l'environnement en niant l'agriculture. Le papier argumente la nécessité de considérer l'agriculture comme une ressource territoriale pour les périphéries d'agglomération et le développement d'un agenda de recherche abordant la gouvernance des territoires périurbains et les modalités de prise en compte de l'agriculture en tant que levier pour le développement de ces territoires.

Introduction

Urban sprawl has blurred the borders between cities and neighbouring rural hinterlands, which have lost their traditional appearance with the establishment of new populations and infrastructures. The traditional relationships between city/countryside have faded in favour of new urban models, thus creating new issues.

The current dynamics should have a long-term impact on these fringes in terms of the reinforcement of a mutual dependency between the city and its fringes and the emerging issues relating to territorial governance and resource management.

In this paper, we seek to re-examine the idea of agriculture as a territorial resource for peri-urban areas. Using a case study on planning strategies in

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urban-rural fringes, we try to demonstrate that agriculture is not considered enough and that it should be seen as a territorial resource for peri-urban interfaces. The paper recommends developing a research agenda to tackle the governance issues surrounding peri-urban agriculture and the ways it can be used as a territorial resource.

First we present the theoretical background, setting out the concepts we use in this paper (territorial resources, hinge areas) in addition to an insight into institutional restructuring in France and the way development plans are conducted. Secondly, we present a case study regarding the inter-municipal co-operation of Volvic Sources et Volcans (France). We conclude with some additional questions and research perspectives on peri-urban agriculture as a territorial resource.

Theoretical background

Why do territorial resources matter in hinge areas?

Territorial development is considered as the capacity of the *enhancement of local actors* to shape *their own development dynamics* (Ray, 1999: 259; Lardon et al., 2001: 47). Several French scholars have demonstrated that territorial development is based on the construction of territorial resources (Gumuchian and Pequeur, 2007). Their research considers territorial development as a construction of local capacities. This involves the production of local values involving complex processes that actors have to control and speed up. In addition, territorial resources refer to the local resources that local actors recognise as being valuable, which they promote and which then leads to local regulation and governance.

We consider *hinge areas* as the areas that are liable to multiple socio-spatial influences and dynamics, which can be contradictory or converging. The term *hinge area* refers to interfaces or fringes such as peri-urban areas where urban influences meet rural ones. It can also refer to specific competing scales of governance where plans can be developed, such as in regional natural parks and in inter-municipal co-operations.

The emergence of territorial resources in *hinge areas* involves many issues. If territoriality, as defined by Sacks (1986, cited by Storey 2001), is "the attempts by an individual or group to affect, influence or control people, phenomena, and relationships, by delimiting and asserting control over a geographic area", then the control of space can be used in order to influence or control resources (Storey, 2001). Thus, territoriality can be seen as an opportunity, even through the complex processes of expressing social power, for territorial resources to emerge within a bounded territory. In reality there has been a rapid expansion of complex territorialities that goes beyond the expected boundaries of territories. Inter-territoriality (Vanier,

2008) emerges as a strong social reality and 'hinge areas' as reflecting areas where multiple territorialities meet, are considered as a heuristic laboratory to analyse the construction of territorial resources within blurring and hybrid territories, where there are many local resources and the actors are not specifically organised.

Institutional restructuring in France and development plans in peri-urban areas

Developments plans are promoted within institutional structures, which are set up through a series of legal outlines that govern sustainable development in France. The details of French governance in terms of territorial development need outlining in order to understand their great complexity. Local government in France is very fragmented. It is based upon an administrative division of more than 36,000 municipalities, 100 provinces and 26 regions, which make up three autonomous levels of territorial governance. The territorial structure has changed a little since the 19th century, while the settlement structure has been overturned due to rural migration and urbanisation. Thus, functional spaces have become more and more disconnected from institutional ones.

A 1999 law ("Loi Chevenement", 1999) marked a new step in the institutional consolidation of communes in France by simplifying the complexity of co-operation once used (since the end of the 19th century). They are threefold: the communauté de communes (CC) for rural areas, concerning municipalities with less than 50,000 inhabitants, communauté d'agglomération (CA) for municipalities of more than 50,000 inhabitants but less than 500,000, and communauté urbaine (CU) for urban areas of more than 500,000 inhabitants. The most important thing about these inter-municipal co-operations is that they have become the first level of territorial development thanks to the sharing of fiscal revenues.

Peripheral municipalities are usually at a disadvantage in terms of revenues compared to big cities although they enjoy certain comparative advantages for investors. Regarding inter-municipal cooperation, legislators have been willing to induce cooperation between cities and their peripheries. However, peri-urban municipalities are presented with two options: to accept their subordination to central cities, or to expand their revenue base by cooperating with neighbouring municipalities and sharing their revenue (Nicholls, 2006). Few peripheral municipalities have opted for the first option (Jean, 2000; Vanier, 2001; Di Méo, 2005).

Another law passed in 1999 ("Loi d'orientation sur l'aménagement et le développement durable du territoire", Loi Voynet) provided an additional framework to develop more coherent planning strategies in terms of inter-municipal cooperation. The concept of "Pays" was introduced as

a supra level where the solidarity between urban and rural areas becomes possible[2]. Furthermore, this law recognised the natural regional parks[3] - founded in France in 1967 - as tools for territorial development as do the Pays. Territorial overlapping between regional parks and Pays should be resolved, according to the law, through the necessary compatibility between development plans and programs promoted by both institutional structures. Moreover, the charter of the Pays is supposed to respect the orientation of the charter regarding the parks. The territorial overlapping is considered here as a 'hinge area' that belongs to different institutional structures and where development plans should be connected and spatially coherent. The main issue in this case is that the pays plans are often urban-oriented while plans for the parks are aimed at landscape and heritage preservation.

Within hinge areas, agriculture is a huge issue because of the diverse functions it can support. Agriculture multifunctionality is more significant in hinge areas because of the multiples values associated with agricultural activities and the diversity of stakeholders at place. The variety of structures and values, interests and functions associated with agriculture in hinge areas is challenging in terms of managing and planning agricultural land in these areas. One of the main issues is "to render compatible the protection and development of the collective values and interests in land resources with the values of the people who work the land for their living" (Bryant, Johnston, 1992). Focusing on agriculture through a territorial resource framework leads us to consider that on one side an idealistic territorial development come, on another side a social recognition of a local resource (which means recognising all the values and functions associated with agriculture in an area collectively) and secondly, through a real co-ordination between local actors (which means setting up a governance structure and adapting to the processes associated with it).

Planning strategies revealing urban-rural positioning

In 2006 and 2007, we started a research project on institutional restructuring in peri-urban areas around a mid-range agglomeration: Clermont-Ferrand (Centre of France). In this section, we will describe our research agenda.

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[2] Currently, the Pays gathers multiple inter-municipal co-operation structures and isolated municipalities with space continuity. Usually, Pays have brought together urban centres and rural hinterland.

[3] The natural regional park is a rural inhabited territory. It is recognized by its high heritage and landscape values. It is nevertheless considered as a fragile area, which is organized through a common sustainable development plan aimed at protecting and valuing its own heritage.

The main question was the inter-municipal co-operation processes and rationales that were influencing the future development of these urban rural fringes. More precisely, how peripheral municipalities were positioned on an urban-rural gradient. We theorize that planning strategies reveal the positioning of peripheral municipalities and thus their rationales and strategic capabilities. Such strategies aim at a territorial differentiation from the main city, and this can present a threefold configuration and be analysed through a conceptual framework.

Positioning as a territorial differentiation strategy

The positioning of municipalities on an urban-rural gradient is referred to as the relationship between the urban core and the peripheral rural areas in terms of the social representation of these fringes by local actors. More precisely, such positioning goes hand in hand with qualifying and *categorising* the space actions through inter-municipal co-operation and alliance strategies. This contributes to an institution of collective references that the new co-operative structure creates and reinforces. Thus, it opens up opportunities to specific development projects and land use planning.

At an inter-municipal co-operation level, institutional restructuring is a way to examine the role that social representation plays in space differentiation (Frows 1998, Halfacree 1993). In France, the reinforcement of inter-municipal co-operation has provided an opportunity to gather local actors around a common objective and to take a stand on different strategies of adjustment. The differentiation of rural spaces, used by some scholars (Marsden, 1998; Murdoch et al. 2003) refers to the actions aiming to stand a difference between locus accentuating them purposely and making them visible to the outside (Brunori and Rossi, 2007). Therefore, an exploration of space differentiation becomes increasingly relevant to the place and direction of change in urban rural fringes. The current changes in the urban-rural fringes are related to the institutional restructuring. Cooperation involves a set of adjustment strategies and related development plans.

A threefold positioning configuration

The literature (Jean, 1999; Vanier, 2001; Di Méo, 2005; Nicholls, 2006) shows that the options to cooperate waver from autonomy to subordination to the main city. This is connected to the desire of peripheral municipalities to gain more power as well as a way to resolve local stakes.

In order to qualify the positioning of municipalities on an urban-rural gradient, we proposed an analytical grid of the archetypal forms, which depends on different concepts of cooperation (Loudiyi, 2008; Loudiyi et al., 2008; Loudiyi, 2010). Three forms (Figure 1) were drawn up. Firstly, the cooperation structure was based on an urban rationale and peripheral

municipalities take advantage of the dependence on the town. Secondly, it is based on an intermediate rationale where similar peripheral municipalities form a collective to resist the town. Thirdly, it is based on a rejection of the main city, and peripheral municipalities join neighbouring rural ones. Very often, the first archetypal form is represented by the *communauté d'agglomeration* while the latter two are the *communauté de communes*. The first and the last rationales are related to the identification of a precise spatial category (urban or rural), whereas the second rationale refers to a hybrid category, which is more blurred.

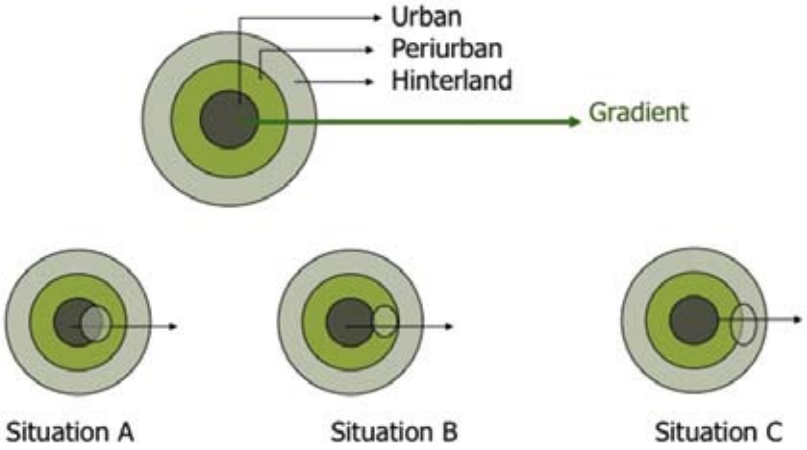

Figure 1: analytical grid of the archetypal forms of municipality positioning.

This type of analytical grid does not exhaust all the possible lines and types of cooperation, or the related positioning of municipalities. However it shows a system of references to understand the modalities of social construction of urban-rural fringes and to understand the relationship between social representation and spatial actions and practices.

A conceptual framework

We propose to tackle the problem using the conceptual framework shown in Figure 2. The conceptual framework enables us to understand the positioning of municipalities through three entries: actors, space and action, which depict the governance processes leading to development models.

The three cornerstones describing the conceptual framework are: (1) options made regarding inter-municipality cooperation, (2) spatial patterns showing local stakes, and (3) planning strategies along with actions and strategies to differentiate places. Here, planning strategies are expressed both by discursive practices (discussions about territories and related projects) and development actions.

The combination of inter-municipal co-operation, spatial patterns and planning strategies represents the different development models. Within the conceptual framework, we hypothesize that:

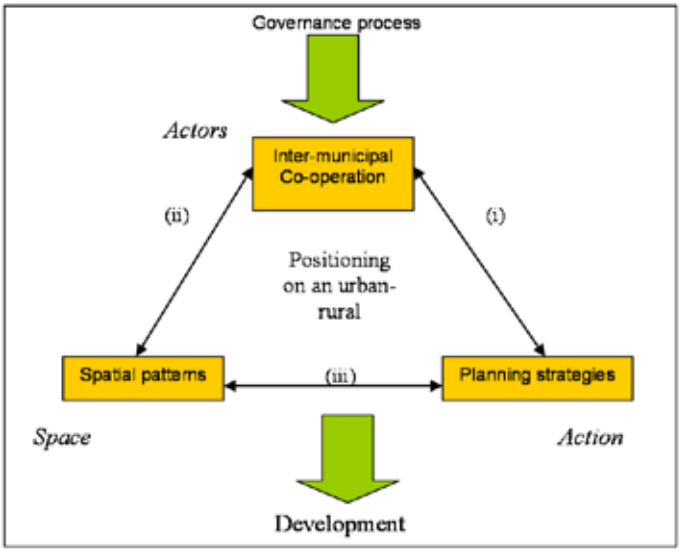

Figure 2: analytical framework of the positioning of municipalities on an urban-rural gradient.

- Planning strategies are the 'translation' of inter-municipal co-operation and the strategies match the cooperation. Thus, we postulate that inter-municipal co-operation is coherent with the observed planning strategies.
- The options provided by municipal cooperation are obviously related to a set of features (such as motivations, actor rationale, historical factors, and strategic capabilities) and use reference systems and lean on spatial patterns.
- Spatial patterns contain local specificity about spatial organisation, thus reflecting the different environments that communities have evolved in and the different stakes involved. They are very often specific to each territory and involve assets and constraints in terms of planning and management. Planning strategies usually modify the former spatial pattern and generate new patterns.

The dynamic interaction between the three cornerstones highlights the positioning of municipalities on an urban-rural gradient.

Volvic Source et Volcans (VSV): a green economy for a protected countryside

In this section we analyse the application of the conceptual framework on Volvic Source et Volcans, an inter-municipal cooperation structure situated in the north-west of Clermont-Ferrand and part of the Pays du Grand Clermont and the regional national park of Volcans d'Auvergne (Figure 3). It is a characteristically hinge area where the social construction of territorial resources shows how local actors have built up a governance structure aiming at differentiate their place.

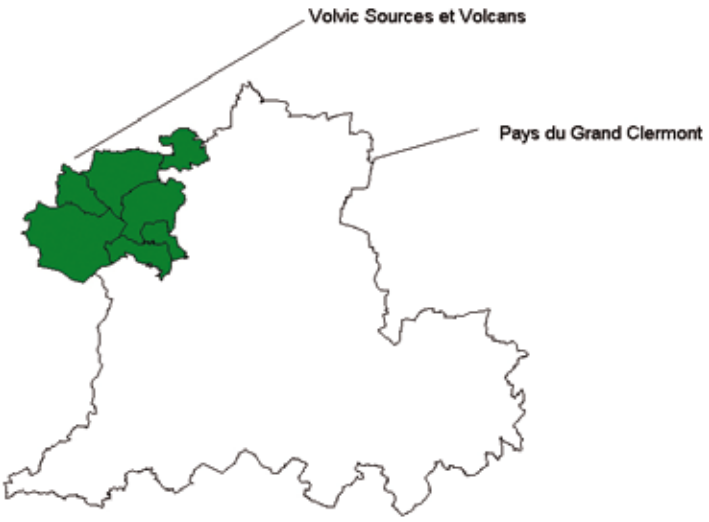

Figure 3: location of the case study (before 2008).

Socio-spatial configuration of VSV

At its foundation in 2002, VSV was made up of six peripheral municipalities (Sayat, Chanat, Volvic, Châtel-Guyon, Saint-Ours and Charbonnières-les-Varennes). It is now formed by seven municipalities (Pulvérières). This structure could be next enlarged upon the west. Within the Pays du Grand Clermont, VSV is considered as one of the most populated peripheral inter-municipal structures (15,000 inhabitants) and since 1999 has been demographically vigorous (+ 9,5%). This is due to urban pressure and demographical attractiveness. Clermont-Ferrand, the main city, is not very far away and the countryside is considered as natural. The economic structure shows 3,500 jobs for less than 25% of the local population, most of them working outside VSV.

VSV has important fiscal resource due to the professional tax coming from many companies: Volvic mineral water with 700 posts, Hermès (luxury leather) with about 150 employees, in addition to jobs related to thermal activities at Châtel-Guyon and Vulcania at Saint-Ours (a tourist centre). There are also many tourist resources because of the presence of European volcanoes and the protected landscapes. However, VSV is considered as a multifunctional territory. At the east, on the hillside, the area is mostly devoted to urbanisation while the centre is occupied by forests and a large natural area (mineral water sources). At the extreme west, there are mainly open spaces devoted to agriculture, and especially dairy cows.

How institutional cooperation helps to build local abilities

VSV was created in 2002 through the cooperation of the six peripheral municipalities of Clermont-Ferrand. Each municipality made its own decisions before drawing up a development plan together with the others (Loudiyi et al., 2008, Measson et al. 2009 and Loudiyi, 2010). It has evolved as a joint process of refusing subordination to the main city and willingness for autonomy in the peripheral municipalities (Figure 4). Châtel-Guyon and Volvic refused to join Riom and the local challenge involved being able to set up an independent inter-municipal cooperation without joining the main cities. Encouraging interaction between similar municipalities has led to the opportunity to reinforce social capital and enhance strategic capabilities. Arguments about this cooperation have been above all to do with the distribution of fiscal revenues and the way local actors wanted to manage local stakes. To join the main city meant losing control of financial revenues.

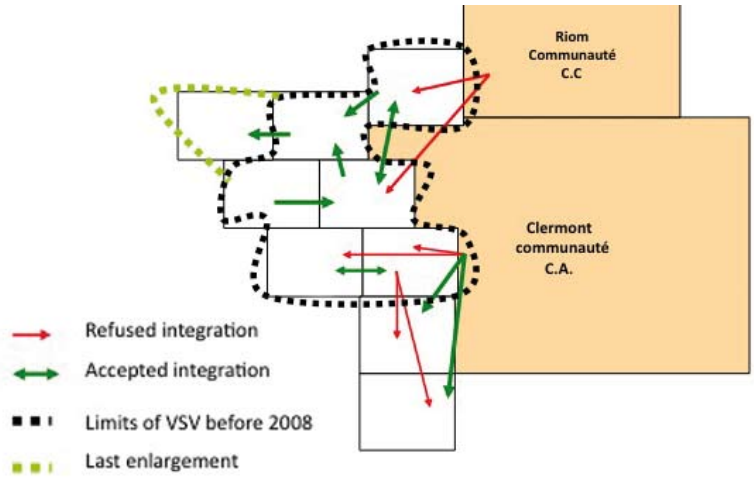

Figure 4: Cooperation process in VSV.

Valuing local resources through a green economy and tourism

The first agreement between local actors focused on the social representation they had about their territory. The general idea of VSV as the "greenbelt that should be preserved" got a great deal of support from elected officials. The main actions to be then developed were to control urbanisation and develop the tourist industry. Similarly, VSV chose to promote the municipalities' own projects. Planning strategies from 2002 to 2007 demonstrated that the common development plan of VSV was equal to the sum of municipal plans (Loudiyi et al., 2008). The planning strategies were as follows (Loudiyi, 2010):

- Reinforcing economic development through territorial resources: industry and tourism are promoted in order to create jobs near home. The location of branded enterprises (such as Volvic and Hermès) encourages local actors to produce a discourse on the high quality of production due to an outstanding environment.
- Preserving the Environment and Landscapes: greenbelts give a new image of rurality that relates more to an idea of preserved nature than to agricultural activities-although the land use is often agricultural. The new rurality is an ideal of pure and tidy spaces. In the same way, efforts have been made to transform a lot of wasteland into public gardens. The aim of landscape management, therefore, is to produce a community life ideal that marks a difference from the outside world and supports a symbolic rural function.
- Constructing a Territorial Identity: the conservation of the cultural heritage in the area includes the restoration of vernacular features such as crosses, fountains, troughs, and wash-houses, which recall both past agricultural activities (e.g. cattle breeding) and the main local resources (i.e. water and volcanic materials). The territorial identity of Volvic Source et Volcans is summarized by the name local actors have chosen to describe their shared space. Firstly, "Volvic" refers to the volcanic stones as well as to the mineral-water industries that are well known overseas. Secondly, "Sources" highlights that the territory has plenty of water and thus contains one of the most important elements of life. Thirdly, "Volcans" evokes the natural environment and the unique and beautiful European volcanoes throughout the territory. It is clear that local actors, following a differentiation strategy based on environmental quality, have relied on the national and international visibility of place-based industries to highlight different rediscovered local resources.

Thus, local actors fix the fundamentals of political life at VSV: the greenbelt as a general representation of territory, preserving the environment and landscape as a general framework of the political agenda and a method

of sharing resources: a single development plan for every municipality. Although planning strategies are mostly aimed at the preservation of natural resources (water, environment) and open spaces (landscapes of volcanoes), under no circumstances is agriculture evoked in local discourses and no specific action affects this activity that takes up more than 50 % of the whole territory.

Conclusions

The positioning of VSV for greater autonomy is based on a sense of shared identity that is totally constructed by local actors. It expresses the co-construction of vision for a shared-space and refers to the common challenges facing local actors, who try to create a better future for their community, and in the process break away from uncontrolled urban dominance. The VSV development plan is based upon a green economy favoring environmental protection. Despite the existence of large agriculture areas, promoting this agriculture is not seen as a priority. Currently no relationships have been established between land uses and land functions. On the one hand, elected actors have been absorbed by the *benefits* of urbanization (population and the attraction of activities) and have tried to construct an attractive image based on the environment. They thus forget agriculture and its impact on the territory. On the other hand, farmers do not seem to be affected by the urban dynamics.

Based on the example of VSV, we suggest that agriculture can be a territorial resource in peripheral areas. Agriculture could thus play an integral role in local resource diversity and local actors' stakes (as well urban and rural ones). Thus, it could be the essential link to bring together urban and rural rationale. These assertions are based on the assumption that peri-urban agriculture involves new development models in peripheral areas. Therefore the question is not whether agriculture is a territorial resource or not in peri-urban territories such as VSV. It is rather about the conditions that would allow agriculture to become such a resource. On the one hand, we wonder how a development model based on agriculture can resolve the problems in hinge areas. On the other hand, we asked about the conditions under which actors situated in hinge areas can contribute to the emergence of agriculture as a territorial resource. This involves an understanding of the abilities of local actors to move towards such new development dynamics and models, and thus all knowledge and competencies they will need to achieve this goal.

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Peri-urban agricultural areas and planning

Introduction[1]

It is not a new claim that suburban areas are marked by extreme speed in their dynamics of change. In fact, farmland on the outskirts of large cities may disappear in a few years, thus erasing most of the landscape structures. Nevertheless, the new spaces dedicated to urbanization highlight a number of specific issues related to the emergence of a phenomenon called re-agricolarisation[2]. The difficult question of the limits of urban sprawl is in fact mostly related to the density of buildings. Indeed, agricultural planning in suburban areas is needed, especially to preserve some continuity of spaces and with the reintegration of agriculture in the city called the "urban countryside" (Donadieu, 1998). New features also appear with production areas being perceived as recreational or as inhabited areas for urban populations (Hervieu and Viard, 1996). Suburban agricultural areas are then considered as hybrid spaces, combining natural and urban patterns of recreational activities with agricultural environmentally-friendly activities of production.

Italian agricultural parks are perfect examples of this. Managing agro-urban projects thus involves specifying the role of different agricultural activities in urban planning (for urban renewal as well as for new urban areas). Suburban agricultural area could therefore be conceived as a new spatial form of organization and as a more global management approach, combining previous sectorial principles and reintroducing farming in urban models.

These management issues also represent a challenge when considering suburban agricultural areas as new territorial areas.

- Firstly, we need to conceive suburban areas as complex and not as simplified and uniformed spaces resulting from the duplication of different forms and functions. It is true that most of the time the development of constructions is the main argument of elected officials legitimizing a municipal project. Archetypes of modernity, urban facilities and equipment (e.g. community halls, sports facilities, school groups) are often the main issues in municipal budgets. The preservation of natural resources is then a marginal item, more often to compensate for environmental damage. Rethinking suburban areas as a global

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[2] A term inspired by and in reaction to an article by Yves Luginbülh entitled "The rural landscape: the agricultural color, the agricultural flavor, but what's left from agriculture?" Rural Studies 121-124: 27-44.

project therefore involves overcoming the usual standard models to imagine new sustainable solutions in time and space. The example of the green and blue grids ("Trames Vertes et Bleues – TVB") defined by the "Grenelle de l'Environnement" in France suggests integrating this complexity in development provided by best environmental practices in the management of suburban areas. Focusing on complexity will also lead to an alternative governance where local actors will debate and validate the agricultural benefits and constraints of suburban development. This will also help to renew the methods of development that will express innovative forms by articulating urban and agricultural patterns.

- Secondly, suburban agricultural areas need to be defined through new agronomic expertise in zoning plans and urban planning. The proportion of good agricultural land disappearing in favor of new housing reveals a lack of a more global consideration of the agricultural issues in suburban development and management. Private engineering and design offices that create Local Urban plans ("Plan local d'Urbanisme" in French – PLU) or Sustainable Development plans ("Schéma de Cohérence Territoriale – in French – SCOT) are generally made up of urban planners, architects, landscape planners or geographers, with little or no experience in agronomy. Hardly any of the afore mentioned professionals in France have yet related the issue of changing land use to the agronomic qualities of land. The issue of preserving the capital of agricultural land is barely discussed in the design of zoning plans despite it being a major issue in meeting the agricultural challenges of tomorrow in these specific areas.
- Lastly, although suburban landscapes appear characterless or non dedicated to agriculture, with relatively few outstanding or interesting qualities (e.g. cultural, patrimonial, or environmental), it is important to consider them as specific areas in terms of management and not as a compromise between urban and rural forms and functions. As an interface between city and countryside, they should be rethought as a hinge of these two, outwards the cultural impositions or previous planning principles opposing them. Local organizations need more than ever to be involved in constructing the meaning of agriculture within suburban areas and not alongside it.

The three papers offer different methodological tools, and consider various elements at different levels in order to bring urban and rural areas closer, to facilitate a dialogue in favour of projects discussed locally, and where agriculture is a major component of the foresight analysis.

Massimo Sargolini is at the department of planning and environmental management at the University of Camerino (Italy). In his essay, "Urban sprawl of the Adriatic coast and ecological corridors", he offers analytical

tools to work on detailed ecological continuities through inventory mapping. Landscape ecology principles applied to a planning exercise are illustrated in an urban area under pressure: the Adriatic coast. The experience of the Adriatic urban sprawl ("Città diffusa adriatica" in Italian) shows how to reconstruct an ecological continuity in relation to agriculture.

Claire Planchat is at the UMR Metafort (Clermont-Ferrand, France). In her article entitled "Agriculture and local urban planning. The example of Billom", she examines the place of the agricultural issue taking as an example local actors in a small village in Auvergne (Billom / Puy de Dome), and establishes the landscape as a mediating tool to develop a new territorial project. She uses landscape diagrams (3D mapping) in support of her discussion and exchange between local actors to re-examine local planning.

Daniela Poli is at the Department of Urban and Territorial Planning of the University of Florence (Italy). In her paper entitled "The agricultural park in central Tuscany: innovative tools of project and governance", she shows how research action leads to the mobilization of local actors in terms of a new perspective on the reorganization of urban systems. This perspective takes more account of suburban agriculture in the definition of a territorial agro-forestry and suburban planning program for the agricultural park of central Tuscany.

Adriatic urban sprawl and environmental continuity[1]

Riassunto Nella città diffusa adriatica, la cura delle condizioni di biopermeabilità territoriale e del mantenimento delle continuità ambientali, come pure il ruolo dell'agricoltore tradizionale, o dei "nuovi abitanti" di questi territori, sono da riscoprire, ricercando strumenti idonei a leggere le dinamiche evolutive degli spazi aperti, interpretando, progettualmente, le trasformazioni territoriali che si profilano all'orizzonte.
La pianificazione urbanistica ordinaria, così com'è attualmente praticata, non sembra però attrezzata a gestire i profondi cambiamenti evocati. L'inquadramento paesistico-ambientale è certamente l'angolatura più efficace per dare un senso al disordine ed alla dinamicità, per dare spazio alla diversità ed al tempo, per indirizzare e catalizzare uno sviluppo nuovo.
Ripartire dalle strutture del paesaggio e dalle continuità ambientali è quanto la contemporaneità ci chiede per gestire la complessità integrale del territorio, senza dividere arbitrariamente le cose dal loro divenire.

Résumé Au sein des espaces périurbains de la cote adriatique, l'aménagement de la bio-perméabilité du territoire et de la continuité de l'environnement, ainsi que le rôle des exploitants agricoles traditionnels ou des nouveaux arrivants, sont à redécouvrir. Cela est à faire en enquêtant sur les nouveaux outils capables d'interpréter les dynamiques des espaces ouverts et les perspectives de transformations des territoires.
La planification ordinaire de l'urbain, telle qu'elle est actuellement pratiquée, elle ne semble pas en mesure de gérer ces dynamiques et perspectives. Une approche agro-paysagère semble appropriée pour donner du sens au désordre et aux dynamiques, pour donner de l'espace à la diversité et au temps, pour guider un nouveau type de développement.
Recommencer par la structure du paysage et de la continuité de l'environnement c'est ce que nous demande notre temps pour gérer la complexité du territoire, sans partager de façon arbitraire les objets paysagers de leur évolution

Consumption of soil and search for a new balance

The famous prediction of Albert Einstein that holds the possible disappearance of bees as the end of humanity[2], has long been considered a paradox and a fictional hypothesis. However it urges us to consider the value of bees as an environmental indicator and the relationship that inex-

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[2] See: Albert Einstein: **"**If the bee disappears from the earth, mankind would remain four years of life, no more bees, no more pollination, no more plants, animals no more, no more human beings**".**

tricably binds the fate of the planet Earth to the fortunes of agriculture. It is clear that if there is no pollination then this has a negative impact on the agricultural environment[3]; this is a service that nature provides for free, and without which we would not be able to take advantage of most plant resources. Besides any possible relationship between the decline of bees and the future of the planet, it is disconcerting to note that those involved in the governance of the territory do not consider the relationship between human activity and balances of nature.

The impact of land use on the ecological balance has not been adequately assessed. Often the project is not based on interpretations of trends. At best, the project captures images of change, situated between perception and representation, but it does not capture the processes of biological transformation. In other words, it does not adequately assess the limits of nature and the dynamics of its transformation.

A recent study on the state of the environment of the Marche Region showed that, in addition to the gradual erosion of essential resources such as air, water and biodiversity, is the increasingly high consumption of soil, because of land use decisions. This worrying trend has also been evident in recent years. Often the urban land is not proportional to population growth. Over the past half century, the population growth of 37%, it has been matched by an increase in land consumption of 300%.

These dynamics have affected not only the Marche but the entire Adriatic area. Sprawl is often considered as prefiguring a new urban design, with new compositional structures, a new formal balance, new geographies with its impact on the regional systems of roads, logistics, services and settlements. No one remembers that the extent of urbanization in agricultural or natural areas induces a change in their ecological environment. Nobody seems to remember that new environmental matrices must be built to perform the function of biological connection for many groups of plants and animals. In addition, the slow but inexorable decline of agroforestry-pastoral traditional activities (being no longer economically viable) is not only the undoing of the historical and architectural value of agricultural landscapes, which belong to the collective imagination of local communities, (and which could lead to new endogenous economies), but also results in a reduction in biodiversity and ecotonal articulation due to a loss of alternation of sites with different ecological characteristics (Figure 1).

[3] It is estimated that the contribution of bees pollination is at least 80 percent of the total. Thus, according to a study of INRA, CNRS and Helmholtz Centre for Environmental Research (UFZ), the value of pollination on the main crops that feed the world was over 150 million Euros in 2005 or equal to 9.5 percent of the value of total production used for food during that year.

In recent years, the proliferation of pseudo-urban towns in rural areas originally in chaotic and almost random forms, with no spatial pattern default, has created a juxtaposition of traces of ancient rural life with new industrial platforms, tourist and residential towns, shopping centres and wilderness areas (Figure 2).

New landscapes are planned everywhere. These should be staggered to ensure bio-permeability in order to create a new balance between man and nature.

New Worlds of Senses for Farmlands

Throughout history the rural world has undergone profound changes, however it was completely overturned in the last century by industrial civilization.

The incidence of agricultural production on the Italy's GNP has collapsed; Aristotle's affirmations (which considered agriculture as the most important of the human arts) and Xenophon's idea (which associated cultivation with the fortune of the individual and the fate of the community) no longer seem to have any sense. The race for the mechanization of agriculture and for productivity growth has encouraged farmers, "supported by public aid and by agricultural price policy", to develop a type of business based on heavy increases in energy and chemicals, but this route had no result.

Today, new lines of rural development are needed not only to deal with the reduction in earning power and the declining and aging workforce, but also because agriculture is a means of generating the landscape and the environment.

It is not an accident that the European Landscape Convention enacted by the Council of Europe and ratified by the Italian State through law number 14 of 9 January 2006, urges local governments to "integrate landscape in policies of land planning, town planning" with particular attention for "those on ... agriculture", and for other "policies which may have a direct or indirect impact on the landscape".

This requires a recognition of new rural areas, their tendency to create new landscapes in terms of being markedly visible and symbolic of new identities, which are then effective for an integrated local development.

Moreover, today, some international policies on energy and water e.g. the Kyoto Treaty, covering rural areas, can no longer be extended.

The rediscovery of tourism linked to landscape is increasingly related to the upgrading of quality. The new development projects promoted by PAC consider, in particular, the enhancement of product quality and more generally cultural identities, improved functional status of the rural environment, conservation of biodiversity and development of new non-farming activities in services and sustainable recreation tourism. New rural policies are

therefore required to respond to a rural area that is increasingly the scene of complex transformations. It is nevertheless still the embodiment of a constant relationship between the work of man, the balance of nature and the future of humanity. The identities of the spaces of agriculture, are continually remodelled due to action of natural factors and / or humans and their interrelations. We have so many different identities.

A new relationship between town and country

Agriculture is increasingly called upon to play a particularly important role, not only for its contribution in terms of added value and employment, but also in terms of the ability to protect and preserve the agricultural landscape and provide environmental and recreational services. In this sense we understand the importance of maintaining the rural population in areas of quality landscape and environment, for the preservation of local culture and traditions, as well as to secure control over the territory.

A targeted integration between landscape policies and agricultural policies could also be an occasion to bring in new agricultural entrepreneurs, especially young people, capable of driving the reorganization of agriculture through a diversification of business and integration with new functions such as tourism. No less important is the return to the use of grassland to encourage the breeding of rare and endangered breeds, thus contributing, at the same time, to maintaining large areas of pastures and promoting biodiversity.

There is a renewed interest in rural areas. Many people go to live in the countryside and attempt to play a role in rural activities. Certainly, it can be seen as a source of wealth for local communities residual. These new inhabitants of rural areas, often from the cities, choose the land as a kind of protected area or at least for its high environmental value and, once settled, they see any negative changes in land use, particularly new housing, new roads and new residents. According to the sociologist Giorgio Osti, who has worked extensively on these issues, there are basically two categories of real neorural Italians: retired people who return to the village where they were born, and young people who go to the countryside to create a new lifestyle. Besides these, there may be other isolated cases such as poets, artists, immigrants and refugees. Essentially, new players are emerging to implement agricultural measures, provided by the context of Community policies. The "promotional contracts" signed between the government and farmers who engage in business to ensure the protection of natural resources, biodiversity, cultural heritage and landscape and forest, could be profitably used by *newcomers*. This is because they have the necessary educational background to devote special attention to the landscape and environment, which is consistent with the objectives of improving the landscape quality of rural

areas in the European Convention for Landscape. Thus, areas of environmental significance could become the first experimental target for these new contracts. However, it is necessary that, the involvement of agriculture is considered in close relationship with other environmental and tourism management measures based on positive experiences of *integrated territorial development*. Farmers might be included as contemporary producers of a new rural culture, not just urban-industrial, which is characterized by values, tools and processes that define the heritage of knowledge and distinctive relationships.

Moreover, in recent times, a new focus on the environment has been emerging and, more generally, the rural landscape. It is considered: i) an essential element in the quality of life, ii) a way of countering the loss of cultural identity in the territories, following globalization, iii) an economic resource that could generate employment and income. Landscape quality (as an expression of the synthetic quality of the total area) is increasingly important, economically and socially. It responds to: i) new social demands, which reflect the hopes and fears of contemporary society to address the risks and threats of the loss of contact with the land and the identity of a place, ii) new rights such as the law of nature, beauty, or security, claiming new spaces for socialization.

The emerging interest in nature and rural citizens must be understood in depth and in all its various possible effects, thus presenting a new cultural challenge. The new design ideas for the city and the region should include contacts and fruitful relations between the country and citizens. A new vision concerns the design of the green countryside and its natural texture with functional links between urban green spaces in the city and the rural spaces.

Adriatic urban sprawl

Sprawl, which increasingly tends to blur the city and the countryside, is leading to two major transformations throughout the Adriatic.

One change is the relationship between the mountains inland (which are more marginal and remote), the intermediate hilly areas (where traditional pastoral practices of agro forestry are regressing) and the costal settlements (which operated on north-south roads) contradicting the historical relationship between the sea, hills and villages.

Recent studies[4] have described the trends in these scenarios:

[4] One of the most important is certainly the APE (Apennine Park of Europe). It is the result of inter-university research on environmental infrastructures and the prospects of development of the Apennines within the European framework, organized by the Ministry of Environment - Nature Conservation Service and the CED-PPN (European Centre for Documentation Planning Parks natural) Polytechnic of Turin.

a) the sprawl that spreads from the coast inland along the valleys is the ideal zone for new settlements (the hills are not too steep) and the remaining feral land, favours the formation of a large green gap between the sections of the Adriatic and Tyrrhenian;

b) the rapid emergence of an infrastructure for a rapid east-west crossing of the Apennines, which facilitate fast and productive contacts between mountains, hilly areas and the coast. However at the same time it threatens to undermine the widespread permeability that characterizes large parts of the territory and also underpins the development of rural tourism;

c) the nostalgic preservation of many fragmented local environments, with special attention on traditional rural areas that local pride could give rise to an asphyxiated milieu, unable to network resources, to build cooperative and coordinated actions for rural areas and promote tourist projects and social participation expanded to three areas (mountains, hills and the coast).

The second change is the way animals and plants move into these new places. If the *disorder settlement* in the contemporary urban sprawl disrupts forms of traditional pastoral-agro-forestry, which is essential to perform functions of bio-connection, a new territorial balance becomes necessary. Thus, ecological networks could become structural components that are essential in finding operational intervention in the management of urban sprawl, moving towards the desired model city, through design approaches that are open to change.

The structural role of environmental continuity

The urban sprawl, becomes the status quo for urban planning, should not only to identify a new urban design and new formal balance but also new continuity environmental inland from the coast, through the reduction of biological fragmentation. Green districts need to be connected with rural landscapes of the immediate hinterland and the natural basin of the Apennines. The research of structural role of environmental continuity from east to west could lead to a deepening relationship between cities and rural areas:

a) to contribute to form and maintain environmental units particularly those that are the subject of conservative policies, such as parks and protected areas;

b) to help to connect the different units, to ensure their mutual interaction, each to ensure a degree of *openness* required for life cycles and the possibility of exchanging matter, energy and information;

c) to constitute the basis for organizing a lightweight system. In an organization, the activities of living, work and leisure, which are increasingly structured *networks*, in which the territory is presented as a *network of networks*, should be adequately recognized and should regulate the rela-

tionships between different nodes. Making links and relationships with other environmental networks will help to produce encouraging synergies. Networks thus become a structural component of municipal planning, or at provincial and regional levels.

Figure 1: Adriatic Urban Sprawl: example of Tronto Middle valley. In the background the Sibillini Mountain National Park.

Figure 2: Adriatic hilly agricultural area. In the background, the urban Adriatic sprawl.

Figure 3: Valle del Tronto. Example of the "network of networks": highway, rail, river roads, continuous environmental, residential factories and industrial factories.

Figure 4: Marche region. A draft of ecological network.

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Agriculture, landscape representations and Local Urban Planning - The case study of the municipality of Billom in France[1]

Riassunto L'analisi delle componenti sociali, spaziali ed economiche dell'agricoltura è ancora scarsamente integrata con i progetti di pianificazione urbana. I metodi di partecipazione portati avanti nel corso di queste procedure, e riguardanti nello specifico le problematiche agricole, hanno più una finalità di comunicazione che di negoziazione. Proponiamo l'uso simultaneo delle rappresentazioni paesaggistiche, spaziali e sociali, realizzate nell'ambito di incontri collettivi, come strumenti di scambio e di visualizzazione degli impieghi e delle sfide agricole da integrare nei documenti urbanistici. Presentiamo uno studio realizzato in occasione dell'elaborazione del Piano urbanistico di un Comune sito in area peri-urbana, quello di Billom (Auvergne, Francia).

Résumé L'analyse simultanée des composantes sociales, spatiales et économiques de l'agriculture est encore trop rarement intégrée dans les projets de planification urbaine. Les méthodes de concertation sur la question agricole, menées au cours de ces procédures, mobilisent davantage des outils d'information que de dialogue. Nous proposons l'usage des représentations paysagères, graphiques et sociales, dans le cadre d'ateliers participatifs, comme support d'échange et de visualisation collective des usages et des enjeux agricoles à intégrer dans les documents d'urbanisme. Nous présentons notre démarche réalisée lors de l'élaboration du Plan Local d'Urbanisme de la commune périurbaine de Billom (Auvergne, France).

Introduction

The objective of this work is to analyse how agricultural issues can be addressed with a Local Urban Planning project. In these procedures, the agricultural question is dealt with from three points of view. Firstly, agriculture is regarded as an economic activity dissociated from land management. Secondly, planners consider agricultural areas principally according to locations for future urbanisation. They do not take care of the agronomic qualities in comparison with the different *qualities* of urbanisation. Consequently, a mosaic of zones appears: urbanised areas include natural and agricultural areas which are seen as *green areas*. Thirdly, an environmental awareness is being raised through the concept of 'cadre de vie'[2]. In this case, agricultural areas are regarded as landscapes or as natural zones to protect. In sum-

[1] Claire Planchat- Héry – UMR Métafort, Clermont-Ferrand

[2] "framework of life": encompassing the whole environment with human situation and lifestyle

mary, agriculture is generally considered through land rent, employment from an economic point of view, and as a collective landscape, but rarely as a territorial inscription of farming (Pierre and Le Caro, 2007), i.e. as a local and multifunctional project managed by farmers who are at the same time stakeholder and inhabitant of a territory.

New methodological contributions and tools could help to reveal these agricultural dimensions in order to reduce the gap between the needs of the farmers, the quality of farming lands and their becoming in front of the urban sprawl and the social demand of environmental awareness. Participative principles are interesting to improve stakeholder involvement: participation means that stakeholders can contribute to building a strategic and shared vision of how the planning process should take place (Lardon, 2001). Participative approaches with landscape designs are really efficient for meeting the stakeholders who are seldom involved in the planning process (Joliveau, 2001).

In the context of the Urban Local Planning of the French municipality of Billom (Figure 1), I proposed to develop participative approaches using the landscape as a kind of mediator. This mediation consists in using visual designs of landscapes as intermediate tools. These designs help the participants (farmers, local authorities and planners) to share their knowledge and

Figure 1: location map.

understanding of the *territorial inscription* of the farming but above all their expectations in order to act on the elements which make up the features of the farming landscape. The aim is to find a better integration of the agriculture issues within the urban planning project.

Reading grids and case study

This section outlines why it is interesting to use a landscape representations grid to integrate agricultural issues into planning. Then, the case study of Billom is presented in order to better illustrate the context of the planning stakes for agriculture in a peri-urban municipality in France.

From landscape representations to landscape archetypes

According to the Laboratory THEMA (2005), *landscape representations can be defined* as spatial features combining various spatial elements. According to Peirce's theory (1978), these elements can be analysed with semiotic tools: the Landscape is linked to a relation between its physical existence, its visual image and the meaning of this image in terms of the cultural background and knowledge of an observer of these spatial features. Various types of images of farming landscapes can be produced by stakeholder involvement during the planning procedure. The output of this research is to reveal a typology of landscape archetypes. An archetype is a model of landscape representations as a cognitive processes red with semiotic tools and developed by stakeholders in the aim to improve interventions on the elements composing territorial and social farming landscapes. In other words, the shared knowledge of the agrarian landscape processes raised from the participative activities, increases stakeholder awareness of the various actions that could be developed in the planning project.

Moquay et al (2007) developed a first grid of three archetypes which is called *typologies of the local landscape interventions*. I propose to adapt it as *typologies of the local farming interventions* for urban planning. I suggest adding two more archetypes (in grey). Table 1 shows the new grid that I experiment on the case study of Billom:

The first archetype is *the expert landscape*. It refers to the specific planning step: the expert's diagnosis. Its aim is to point out by technical or scientific point of view the elements of the farming landscape that qualify the territory. The second archetype, *the landscape of the identity*, describes the identity processes revealed by farming landscape elements selected by stakeholders in the aim of a social recognition (Verges, 1993). The process of this selection relates to various space scales, values, activities on the landscape elements which help the stakeholder to explain his social membership (i.e. during a survey: "I am the cultivator of this land which must be protected"). The

Steps	1	2	3	4	5
Incentive levers	Territorial Studies, Knowledge	Representations	Visible and invisible forms	Expectations	Political process
Selected landscape elements	diagnosis of the agrarian landscapes and territories: lists of elements, models, processes	Identity process trough property	Technical and aesthetical explanations about the elements	Positioning of the expected operations of farmers and officials	Direct action on the elements
The Landscape as a whole	Diagnosis with technical data	Practices, territorial processes, landscape values	Collective knowledge of undesired Surroundings	Social and professional values, norms and poses	Land development, expected operations
Archetypes	Expert Landscape	Landscape of the identity	Landscape 'cadre de vie'	Landscape of expectations	Territorial Landscape

Table 1: the grid of typologies of the local farming interventions for urban planning. From Moquay et al. (2007).

third archetype, *the landscape cadre de vie*, exposes two processes interlinked: a landscape element is not only selected because of aesthetic values but also because of ecological and social acceptation (i.e. lands of intensive agrarian systems are less desired as surroundings than extensive ones). The fourth column is linked to the obligatory consultation steps of the official planning processes. Usually, this step shares information's about the planning project with people besides the decision makers. But rarely these people, and particularly the farmers and land owners are involved to inform about farming issues. This is why I propose to analyse with them the l*andscape of expectations* (Planchat-Héry, 2008). It means "which are the farming landscape elements they select and "what actions do they want or not want to do, to share, to carry out" on them? The last archetype is *the territorial landscape*. This archetype reflects the processes of the integration in the planning document of the farming landscape representations and interventions as some political arguments for planning the whole territory. The municipality of Billom illustrates this participative approach.

Diverse farming systems on the municipality of Billom

The municipality of Billom (4575 inhabitants in 2007) is located in the south-east rural-urban fringe of Clermont-Ferrand (140 700 inhabitants), at 20 km from the urban center (Figure 1). Sixty six percent of the surface of Billom are agricultural areas and on a relief with various necks volcanic

which are punctually wooded. (Figure 2 - photograph of the territory of Billom). The proximity of the agglomeration of Clermont-Ferrand has led to a greater urban influence characterised by various changes. The migratory balance was around 2% between 1999 and 2007. More than 40% of the working population works in the urban area. Around 635 new constructions were built between 1975 and 2003, 85% were individual buildings, and these increased the surface area of the central borough by more than a quarter between 1999 and 2004.

Twenty one farmers were living in Billom in 2000, compared with 69 in 1979. From 1975 to 1999, imbalances between urbanisation and crops were accentuated. The cereal crops (73% of the various productions), particularly corn, dominates the other productions: sugar beet (9%), colza (4%) and grazed surfaces (5%). Many vines have disappeared but survive on some slopes of the volcanic hillocks, especially for private production. The livestock production is seldom represented, although less than a quarter of the farmers are involved in such production.

Figure 2: photograph of the territory of Billom by C. Planchat 03/2007.

Awareness raised about farming systems improves the management of their impact on the territory. Between 2005 and 2008, elected officials integrated this hypothesis into their planning process. Their aims were to raise collective knowledge about farming systems and sustainable landscapes, by developing workshops with farmers in order to enhance the decisions of the planners and the elected officials.

Methodological steps

Planners tend not to use the landscape tools to explaining territorial stakes, they generally favour maps. The manner of observing landscape elements is interesting according to the observer and its position. The representation of an element can change whether it is viewed from above (Synoptic view) or from the inside, with the tangent of the human glance (Tangential view) (THEMA, 2005).

An intermediate point of view, between synoptic and tangential, can also help to illustrate changes in the features of farming landscapes. Various means can be used to illustrate these various views: maps, photographs, and landscape block diagrams (Michelin, 2000). This is why the landscape archetypes grid can help to understand and combine the expectations and interventions of the stakeholders with regard to farming landscape elements). Table 2 summarizes the structure of the methodological steps and tools. At each step, various tools are used to read synoptic and tangential views in order to find the best landscape mediation and get results and help to model the landscape archetype.

Steps	1		2		3		4		5	
Incentive levers	**Territorial Studies, Knowledge**		**Representations**		**Visible and invisible forms**		**Expectations**		**Political process**	
Visual tool	Tangential	Terrain, photos, maps	Synoptic -intermediate	3D cardboard pattern	Thoughts	Debate on block diagram model	Intermediate	Block Diagram of Negative Prospective Vision	Synoptic	Meeting to read Official land use plan
Visual outputs	Synoptic- intermediate	Thematic maps and block diagram model	Thoughts	Individual survey of the landscape elements selected	Intermediate	Block Diagram of Negative Prospective Vision	Thoughts	Collective Expected zoning map	Thoughts – Synoptic	Official planning document
Archetypes	**Expert Landscape**		**Landscape of the identity**		**Landscape 'cadre de vie'**		**Landscape of expectations**		**Territorial Landscape**	

Table 2: methodological steps and tools.

Results

This section briefly describes the interest of each stage and the landscape designs (block diagrams in Table 3) built for each archetype.

Expert Landscape

This archetype reveals the author's perception process of the territory of Billom and the landscape. Farming landscape elements were collected

and classified into a catalogue developed from the grid of the OPTMC[3] (Enjelvin et al, 2000). Maps and chronological block diagrams (Table 3 - T0 and T+1 modelling expectation) were made to combine socio-economic and agricultural changes, continuities and consequently stakes. These combinations helped in the composition of visual aids which were discussed by the stakeholders during surveys and workshops. They were also used as indicators for collaborative knowledge appraisals: landscape changes can easily be read using these visuals means according to the different results and representations of the subsequent steps. For example, the first block diagram which I modelled is black and white, because it was only made to reveal landscape structures.

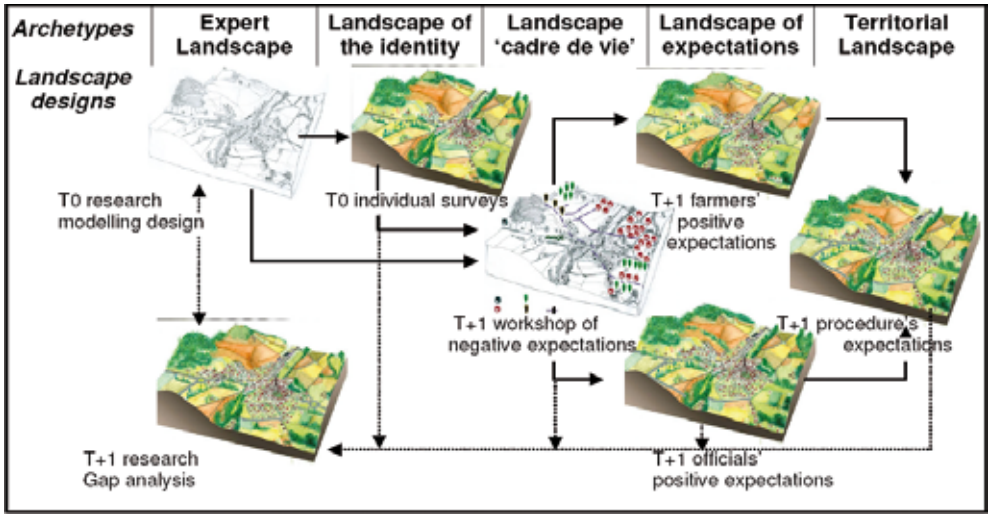

Table 3: landscape designs built for each archetype.

This method is iterative. At the end of each step, landscape elements, selected according to the different archetypal process, are assessed in comparison with the catalogue. At the end of the methodological process, the gaps between the different landscape representations that stakeholders made during the workshops can be assessed through the block diagrams, (Table 3 – e.g. to cultivate the top of the volcanic necks with crops was one farmers' expectation, whereas the stakeholders of the procedure expected more tree plantations). How the farmers' point of view continues to be involved in the planning process is appreciated by analysing the spatial distribution of the farming areas from the official document.

[3] Observatoire Photographique des Paysage des Territoires du Massif Central

Landscape of the identity

Two types of results describe the identity processes:

- The farmers' expectations were selected elements concerning land owners, family-run businesses, farming investments (e.g. irrigation, plantation of hedges; in a survey one farmer stated: "it is my field here, it's grass, I am retired, but my wife comes from a mountainous region, so I keep only three cows for her and they are on this field."). With these data, maps of the sociological dynamics of the farmers were created. The planners then introduced these maps into the official document (Groupe SYCOMORE, 2007).
- The officials' expectations were defined precisely some elements located according to various scales, and their preferences and propositions of management (e.g. urban renewal, maintain some paths and relics of old vineyards). Open fields of crops, castles were elements selected to depict images for territorial attractiveness. The image of Tuscany was chosen for Billom' surroundings.

In this step, the most important element selected by stakeholder became landscape representations that I completed and "colored up" on the block diagram (Table 3 – T0 individual survey).

From the "Cadre de vie" Landscape to the Landscape of Expectations

In this step, the farmer's framework of their daily life, of their work environment can become the framework of the landscape awareness of the elected official. Workshops produced undesirable landscape scenarios at the step 3, into desirable ones at the steps 4. These workshops help participants to share their knowledge about some specific landscape elements and to rank their expectations regarding these elements. The collaborative block diagrams and maps helped participants to visualise possibilities of direct land management and indirect landscape management.

For example, the discussion focussed on the "good plots of land" to preserve. The owners of these plots were hoping to limit the urban sprawl. They also condemned individual housing as an urban development model (Table 3 – T+1 workshop of the negative expectation). Some farmers wished to transform their old and unused barns into residences. This intervention helps the decision maker to preserve some hamlets and their rural image through traditional farm buildings.

During the step 4, after modelling their negative scenarios on the block diagram, the stakeholders were in a better position to represent the archetype of their positive expectations on a map. They could simulate the future zoning of the agricultural and natural areas. Two maps were created: one from the farmers' points of view, and one from the officials'. At this step, it is crucial to cross the gap between activities for individuals and those for the

community. The planners with the officials had to make the last step which entailed choosing the best collaborative proposals to integrate into the planning strategy. To facilitate the reading of the maps, I modelled two new block diagrams (Table 3 - T+1 farmers' positive expectations and officials' positive expectations).

The Territorial Landscape

This archetype illustrates the process which describes how the landscape elements become a resource of the territorial activities and how the planning documents reuse them as the expected intervention for the best development. The block diagram in Table 3 – T+1 procedure's expectations, shows a model of the landscape interventions would be after the application the official law map. This map positions farming areas as farming zones or natural zones. Some of them will also be urbanised to meet the needs of newcomers

The block diagram Table 3 – T+1 research gap analysis is the author's point of view of possible gaps in the planning process. It was drawn as an appraisal tool used to compare procedure's expectations with farmers' positive expectations and officials' positive expectations but also the intrinsic development of the territory.

There are two main gaps in the planning process:

- The planning project leaves the eastern part of the territory under intensive crop production because it is more interested in preserving the open field system and then in large-scale competition between farm owners. It would be preferred here to create a preservation sector for agriculture and protection of the ecosystems, and a collective land management of suburban farming areas that the law on rural territories of 1999 permits.
- Retired farm owners accepted to classify fifteen hectares of their lands to be urbanised. This area is a real loss for the active farmers. However, officials committed themselves to a more concentrated urbanisation (several buildings per plot of 1 ha rather than just one) with no abandoned fields between buildings. This means that farmers cannot sell their land if the neighbouring field is still cultivated. In this way, the pace of urbanisation would be slower.

Discussion

Finally, the complementary of the reading grid of the *typologies of the local landscape interventions* could be used as a new reading grid of participative approaches and of landscape archetypes to improve the integration of farming issues into Local Urban Planning and to better articulate the various scales of the farming landscapes glances.

The various scales of perception between synoptic and tangential, and more particularly the use of an intermediate mode of representation, helped the stakeholders to propose actions that were better organized on various areas and at different scales of landscape observation. Maps are the principal tools mobilised by the planners to draw up the final plan. Intermediate designs, such as the block diagrams, might constitute a new "powerscape"[4] (Jacobs 2004) for the elected officials. The aids guided stakeholders in building collective expectations and in proposing possible interventions for land management to integrate into the plan: protection of the river banks, care of the hedges, conservation of some historic farm buildings. The participatory steps did not avoid dissension, but information sharing helped to reduce heated debates. Above all, the aids supported the stakeholders; in fact farmers were able to be consulted on a more regular basis during urban planning.

Conclusions

The aids to representing the landscape outlined in this paper provided five Landscape archetypes which are learning and shared knowledge processes about farming issues. To apply the grid of the landscape archetypes into the planning procedure would not only help to identify agricultural stakes but also political difficulties closely related to territorial issues and not only to the aesthetic values of the rural landscapes. Finally, a real obstacle to cross is the adherence of the decision makers and the planners to concert the various glances of the stakeholders rarely involved in the planning procedure particularly for the projects for peri-urban areas.

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The Agrarian Park of Central Tuscany: innovative planning instrument[1]

Riassunto Il testo illustra lo strumento del "parco agricolo" interpretato come potenzialità di rigenerazione dei sistemi insediativi e di integrazione fra politiche urbanistico-territoriali e quelle ambientali, forestali e di sviluppo rurale. La definizione di parco agricolo è fondata su quattro elementi cardine che ruotano attorno al parco come esito di politiche attive. Il parco come: progetto di territorio, progetto integrato, progetto concertato, progetto di produzione di beni e servizi pubblici.

Résumé Le texte illustre l'instrument du "parc agricole" interprété comme potentialité de régénération des systèmes urbains et d'intégration entre politiques urbanistiques-territoriales, environnementales, forestières et de développement rural. La définition de parc agricole est fondée sur quatre éléments qui tournent autour du parc comme nœud de politiques actives. Le parc comme: projet de territoire, projet intégré, projet concerté, projet de production de biens et services publics.

Urban fringes and urban agriculture

Since the 1980s urbanization has significantly changed Italy's appearance, since "suburbanization dynamics take a definitely amplified and discrete character, discontinuously proceeding and designing a low-rise and low-density urban form, hardly comparable to more stable territorial outlooks" (Fanfani, 2006: p. 55). According to data on the Corine Land Cover, between 1990 and 2000, urbanization erased more than 83000 hectares of agricultural land in Italy, mostly for housing (more than 61% of the total), because of the move of several city-dwellers from urban cores to rural areas (Bernetti, 2005-07).

A "third place" originated, a hybrid place barely discernable from traditional urban planning interpretations: this is the peri-urban, the very expression of the post-urban era (Choay, 1994); it is a place where the city loses its sense of *civitas*, of community (Magnaghi, 2000) and is no more able to limit itself, and instead becomes an urban sprawl, inhabited by isolation and anomie, and where communities are untied to places (Bonomi, 1996).

Peri-urban regions also include the "urban countryside" (Donadieu, 1998): agricultural fields that cross urbanized areas, they highlight the potential of environmental regeneration, and should be considered as a public function just like every other service and framework: they are the common goods of a new generation (Sotte, 1997; Sotte and Guihéneuf, 2002; Magni and Costantini, 2004; Donadieu, 1998 and 2008).

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Within the third place of these rural-urban fringes, two territorial typologies meet, with their respective supplies and demands: on the one hand, there are the urban-dwellers who ask for leisure, landscape, esthetics, a fresh and healthy food supply; and on the other, there are rural settlements, after their conversion to multifunctionality they are capable of offering what the city demands. The third place is therefore an intersection where a new urban agriculture is forming: resources, produces and services of this urban agriculture are, or can be, directly used by city-dwellers.

Consequently, urban agriculture is different from rural agriculture, the latter being, in contrast to the former, not primarily focused on urban needs. Urban agriculture emerges from a mutual adaptation: proximity to the city transforms agricultural production, creates new forms of agriculture, while older forms can vanish if they are not adapted to urban needs and ways of life (Donadieu, 1998).

In order to improve the quality of life and to reduce land waste, it is thus extremely important to create multifunctional mixes and land uses in urban fringes that can satisfy urban needs. Several possible land use combinations could be based on urban agriculture (Deelstra, Boyd, Biggelaar, 2001). Indeed, transition "between a rural countryside, apt to produce, and an urban country, where to live and produce, will be one of the most important issues in the debate about urban settlements in the 21st century" (Donadieu, 2002).

New rural nature or agriculture versus beautiful landscape?

Several public policies, both within and outside Europe, have underlined how agriculture could be advantageous to the entire population, both urban and rural. In fact, some regions, such as Île-de-France, have set up public agencies (for example, *Agences des espaces verts*) to deal with the acquisition of good quality agricultural areas under threat of abandonment. Such areas are rented to farmers with a long-term lease, "in order to protect agricultural landscape and to guarantee more suitable activities for the management of large areas" (Camagni, 1994: p.48). Numerous initiatives such as *Interreg programs*, *Metropole nature, Extramet* and *Purple* (Peri-Urban Regions Platform Europe) deal with peri-urban settlements and, along with the EU Cap institution (Common Agricultural Policy) for food processing, are trying to promote a multifunctional and high-quality agriculture.

A similar approach has also been taken in Italy. For example, the CIA (Italian farmers confederation) drafted the "Carta per l'agricoltura peri-urbana" (a charter for peri-urban agriculture), while in 2004 a document edited by EESC (European Economic and Social Committee) aimed to set up town and territorial plans involving several municipalities, in order to preserve and manage peri-urban regions, by promoting agricultural areas and activities through plans (Fanfani, 2006: pp. 58-61).

Urban agriculture, in all its diverse forms, requires an improvement of food production in built environments, in order to supply citizens' needs with healthy and local food. The idea of "food sovereignty" has also become increasingly relevant in industrialized countries, where poverty is becoming more and more common. The idea of food sovereignty introduces an important indication of the evaluation of food capacity in a particular area. Economic, energy, environmental and social crises require short food-supply chains. All over the world, squatters are increasingly taking over fringe areas with community gardens (Rubino, 2008).

In rural areas, a significant number of farm workers cannot get public funds because of the difficult procedures involved in making an application. Thus, a conflict arises between two different types of *qualitative* agriculture. On the one hand, there is *quality* in constructing and selling a beautiful landscape to tourists, thanks to big and medium size companies; on the other, there is *quality* in caring for the territory and in selling foods, thanks to the activity of small businesses usually owned by new generation farmers, who are often motivated by the need to discover their roots and by their insertion into a multi-sector network (food marketing, community gardens, organic, social and ethic agriculture, etc.), which are all activities that in some countries have a social and economical support[2].

This shows precisely how the landscape is no longer considered as a by-product of social and material actions (Crosta, 2000; Pizzo, 2009), but increasingly as a real product, sold to the cultural tourism industry. Multifunctionality implies selling the landscape, which is reduced to a picture molded by the tourist's taste, by the idea of outsiders, and by an advertising concept that trivializes elements of the traditional Tuscan landscape, thus originating *landscape un-signifiers*[3]. The landscape of the insider, of farmers materially taking care of the places they live in, is on the contrary not necessarily *beautiful*, but, as always in the past, derives from the use for example, of discarded items, including garbage (plastic, clothes, bins, old nets, etc.) recovered in the biological cycle. Some farmers are indeed provocatively against the *beautiful landscape*, seen as a *dispossessed landscape*.

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[2] For example, in France there are AMAPs (Association pour le Mantien de l'Agricolture Paysan), while in Great Britain community-supported agriculture is particularly common.

[3] Here I quote a fitting definition by Giuseppe Pandolfi from a lecture on the course on "Landscape Planning and Projects" I hold at the University of Florence at Empoli, concerning the semiological inconsistency between signifier and signified in contemporary landscape elements. For example, cypress-tree paths, once ordering and hierarchizing the landscape, highlighting the main routes leading to important landmarks or functions (cemeteries, villas, farm-villas), and currently bordering all routes, even those leading to nowhere, are a typical example of *landscape un-signifier*: an example of landscape reproducing an easily marketable idea of beauty.

"Is it a utopia, willing to create pleasant countries to live in? In the house-building field, the architect tries to succeed in doing so. Why the urban planner, the landscapist and the agriculturist should not pick up the challenge? This trio is not against nature. But a fourth manager must be added to them, without which the utopia would remain an illusion: the public administrator" (Donadieu, 2006: p.112).

First of all, in order to construct the landscape of the countryside, it is important to address the opposition between the insider and the outsider (Cosgrove, 1990), and instead to promote an open planning process, through contractual planning instruments, such as the "river contract" or the "landscape statutes", which are common in several countries outside Italy.[4] It is therefore particularly relevant to link food sovereignty with territorial sovereignty. This would then attempt to give a new importance to local communities, through the foundation of new democracy tools that all the players could be involved in, including the weaker players – such as small businesses, inhabitants, and the historical landscape. The aim would be not only to construct a *beautiful landscape* that was merely *seen* but also one that was *experienced*. Moreover, it is necessary to provide effective support to farmers, through farm improvement initiatives, financial support, tax deduction, start up initiatives, etc., all aimed at producing goods and services for the community.

The agrarian park as a new instrument

This paper focuses on a research project entitled "The agrarian park: a new instrument for the territorial planning of open spaces"[5]. Many of the ideas that are put forward in the research have come from case studies. The Sage (Sustainable AGricultural Education), University of Berkeley, for example, shows how bottom-up planning should be key, with the involvement of farmers (including part-time farmers and those who cultivate as

[4] Governance actions linked to *amenagement* policies, such as the "Charte agricole" and the "Charte paysagère" in France are particularly relevant here. Again in France there is an association, "Terres en ville", that links administrators and farmers representatives, operating in twelve urban areas and managing peri-urban agricultural activities (Perpignan, d'Aubagne, la Ceinture Verte Mancelle, Nantes, la Rennes Métropole, d'agglomération d'Agen, d'Amiens, Grand Angers, la Pays de Lorient, Toulouse, Poitiers et l'Y Grenoblois).

[5] See 2005-2007 PRIN (Progetto di Ricerca di Interesse Nazionale - Research Program of National Interest), "Agrarian park: a new instrument for the territorial planning of open spaces", nationally coordinated by Prof. Alberto Magnaghi (University of Florence) with the support of the Politecnico di Milano University (Prof. G. Ferraresi); University of Genoa (Prof. D. Moreno); and University of Palermo (Prof. B. Rossi Doria). The Florence office, coordinated by Alberto Magnaghi, studied the agrarian park of the urban ellipse of Central Tuscany. The outcome of the research appears in a book edited by Alberto Magnaghi and David Fanfani (2010).

a hobby) and local players (those working in food and agriculture, large retail, education, restoration). In Europe, Fedenatur (European Federation of Metropolitan and Peri-urban Natural and Rural Spaces) identifies areas where peri-urban natural reserves can be institutionalized in order to preserve traditional agricultural characteristics, through several activities: the promotion of qualitative food production (agrarian parks with a shared management); the recreation of city-dwellers and environmental education (agrarian and theme urban parks); the preservation of biodiversity (peri-urban natural reserves). In 2004, Fedenatur identified 46 agrarian parks in Europe: some of which are in Italy[6].

Models of analyzed parks vacillate between an *institutive* dimension of territorial management – well defined by specific territorial and environmental rules, by governmental authority –, and a *volunteer gathering* of subjects, institutionalized or not, deriving from inter-sectorial policies that actively operate in the territory. With regard to volunteer gathering the rules are unstable, varying as the policies, actions and players vary. The institutive dimension refers to a top-down policy, while volunteer gathering to a bottom-up policy. In order to guarantee effective planning, it is necessary to balance and integrate the two policies. The bottom-up phase should precede the top-down phase. Initially, it is important to guarantee, help and facilitate participation, forums, local improvement agencies, short food-supply chains, social networks, etc.

The top down phase could help to strongly organize all the processes, by learning from the territory and by promoting it through: governmental, inter-sectorial and integrated policies; productivity bonuses; funding; protection and maintenance of agrarian land through laws; the support and the improvement of rural repopulation. It is evident how one of most problematic issues of the "agrarian park" is the low level of integration between all policies, in particular between urban – territorial policies and environmental, forest and rural development policies. The definition of an agricultural park used in the research is based on four focal elements, all of which consider the park as an outcome of active policies. Thus, the park needs to be seen as: *a territorial plan; an integrated project; a concerted plan; a plan whose aim is to create public goods and services*.

The park should be a result of *territorial planning*, and not the protection of an area from any environmental damage potentially caused by economic development. It does not need to be a preserved island (like a wildlife park), rather it should be a comprehensive plan whose aim is the integration of all

[6] In Europe, there are agrarian parks are Paris, Barcelona, Lille, Amsterdam, Lisbon, etc. In Italy, there are agrarian parks: South Milan, North Milan, Prato, Rome, Naples, Palermo, etc. The South Milan Park is the very first agrarian park projected in Italy, covering about 46000 hectares of cultivated land.

its parts. Open agricultural spaces play an important role as a framework for the settlement network (Broech, 2003; Poli, 2010a). Open territory could redefine urban limits, through the creation of new rural-urban fronts (looking both inside and outside the city), border strips, ecological corridors, green wedges and areas intruding into the center of the city, in order to create a new spatial network (Clergeau, 2007; Tjallingii, 2000; Poli, 2010b).

The park is an *integrated project*, based on a dialogue between several sectors and policies that are then executed in a final plan. The rural-urban region is an instrument capable of activating diverse actions (economic, territorial, environmental, landscape, etc.).

The park is a *concerted plan*, different from the bordered areas so often opposed by farm workers and their trade associations: in fact, policies that institutionalize agrarian parks need to involve the whole territory. This kind of plan creates an active territory, socially built by all the players involved (farmers, businessmen, associations, common people, local agencies), all joined together into new democratic institutions aimed at empowering the players involved in the whole process.

The park is *a plan whose aim is to create public goods and services*, both material and immaterial, from the energy- and food-supply to piloting environmental, social, cultural goods and services, as recognized and financed by the local community. The agricultural park, by preserving the local memory and exploiting the territorial heritage, could be a means to create and strengthen local identities (Lardon, Piveteau, Lelli, 2005).

This study applies this approach to the polycentric urban system of Center-West Tuscany, the most urbanized area of the entire region (where more than 60% of the total population of Tuscany lives)[7] .Such a settlement network forms a ring of medium- and small-sized cities, a peri-urban urbanized *ellipse*. Strategies to shape a new spatial order have been devised as follows (Fanfani, Poli, Rubino, 2009):

- A strategic scenario on a sub-regional scale: the green core (see Figure 1);
- A strategic scenario of the Agricultural Park of the Valley of Prato;
- Integrated multifunctional plans for urban fringes (see Figure 2-3).

On a local scale, the plan, following the research - intervention approach, involved a forum made up of local subjects [8]. Interaction with local play-

[7] The area includes the metropolitan region between Florence, Prato, and Pistoia, territorial networks anchored to Lucca and Pisa, and the linear urban system stretching along the Arno river Valley (Pontedera, Santa Croce, Empoli, Signa, etc.).

[8] The forum was composed of several farmer trade associations, and of environmental and cultural associations. The players involved are: CIA (Italian farmers confederation), Coltivatori diretti (small independent farmers), Legambiente (environmental association), Italia Nostra (cultural and environmental association), the South District (part of the municipality), Gruppi di Acquisto solidale (Gas, an association that promotes community supported agriculture).

La Città policentrica dell'Arno

- Aree urbane
- Zone industriali - commerciali
- Aree verdi urbane non agricole

Rete viaria

- Autostrade
- Ferrovie
- Strade Statali

- Pianure alluvionali a seminativo
- Zone boscate
- Zone umide

Il Parco Fluviale: la Valle dell'Arno e la rete idrografica principale

- Riqualificazione ambientale del fiume Arno e dei principali affluenti

The Green Core: i sistemi ambientali e rurali del nucleo verde della Città policentrica dell'Arno

1. Padule di Fucecchio
2. Alveo dell'ex Lago di Bientina
3. Aree forestali delle Cerbaie
4. Aree forestali del Monte Pisano
5. Aree forestali del crinale del Montalbano su macigno
6. Aree ad oliveto terrazzato del versante pistoiese del Montalbano
7. Sistema delle vallecole del Montalbano a oliveto terrazzato su macigno
8. Sistema delle vallecole del Monte Pisano a oliveto terrazzato
9. Pianura alluvionale a seminativo
10. Area dei vigneti intensivi su sabbie gialle e arenarie
11. Area dei vigneti frammisti a vegetazione arborea

- Spazi aperti periurbani: aree agricole periurbane
  - 12. Parco agricolo della provincia di Prato
  - 13. Parco agricolo dell'area metropolitana fiorentina
- Spazi aperti periurbani: aree naturali periurbane
- Spazi aperti periurbani: parchi urbani
- Aree coltura floro-vivaistica

Figure 1: "The Green core of the polycentric city of Central Tuscany".

Legend Figure 1 - Left, the polycentric city of the Arno river (urban factories, industrial areas, green non agricultural areas), the infrastructures (highways, railways and other roads), the River Park: Arno valley and the main hydrographic network. Right, the green core: the environmental and rural systems in the green core of the multi-centre city of the Arno river (Fucecchio marshes, bed of the ancient Bientina lake, Cerbaie forest, Monte Pisano forest, Montalbano forest, olive groves on bench terraces in Montalbano, olive groves on bench terraces in Montalbano valley, olive groves on bench terraces on the Monte Pisano, alluvial cropped plain, intensive vineyards, mixed vineyards, open peri-urban space: agrarian park of Prato province and agrarian park of Florence, open peri-urban space: natural areas, open peri-urban space: urban parks, nursery flower crops).

Figure 2: multifunctional agricultural renewal of a fluvial agrarian area.

Figure 3: retraining an urban border.

ers produced a strategic scenario, divided by the researchers into four local integrated projects. Performance objectives and guidelines to overcome the dichotomy between agricultural and urban land uses helped to define the possible multifunctional transformations of urban fringes. Planning and projects are now awaiting the next institutional step, possibly drawing from the protocol of aims submitted by the forum. The fulfilment of the strategic scenario and local integrated projects depends primarily on the political will to improve a concerted governance instrument, such as an agro-urban improvement agency, aimed at activating the dialogue between forums, governmental institutions, and citizens.

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Sustainability of peri-urban agriculture

Introduction[1]

Is peri-urban agriculture sustainable? According to Brundtland's original definition (1987) an activity is sustainable if it is economically viable, socially acceptable (liveable) and if it uses resources in such a way that they will be preserved for future generations (i.e. intergenerational solidarity). The question is therefore whether, in the diversity of its local configurations, peri-urban agriculture is *economically viable*, *liveable* and whether it uses resources. It is also important to consider, according to Godard and Hubert (2002), that sustainability can be considered both internally (the sustainability of the peri-urban farm itself) and territorially: what is the contribution of peri-urban agriculture to the sustainable development of a territory? In other contexts, for example in developing countries, the importance of this dual approach has been shown, especially to compare the "internal" sustainability of farms and *external* urban projects on farmland.

In this seminar, three presentations deal with these aspects of the sustainability of peri-urban agriculture, including this dual perspective.

A lecture by Christophe Soulard and Brigitte Nougarèdes entitled "liveability for suburban farmers" focuses on sustainability in terms of liveability. The authors note a strong difference between sustainability *prescribed* by Public Policy and sustainability *experienced* by farmers: they specifically look at the subject of work and life conditions for suburban farmers, which is a sensitive component of *liveability* for them. Regarding working conditions, it goes beyond the workload, with the focus on the specific requirements for working in a peri-urban context: the difficulties of moving with farm equipment (from home to the fields, between fields), the often difficult relations with urban neighbours because agricultural practices may be perceived as sources of pollution. Therefore, social relations and the inclusion of farmers in their social environment are thereby affected. Liveability problems are often revealed when farms are passed down from generation to generation. In the urban district of Montpellier, small agricultural villages were created to try to overcome at least some of these problems on the coastal plain: they transfer farm buildings (and often the homes themselves) outside the traditional villages. Unexpected effects have been recently observed, changing the relations between farmers and other residents (such as issues of social equity in access to housing). It thus appears that in peri-urban agriculture, liveability from at least the two aspects described above, is an important element of the sustainability of farms and of the role of agriculture in land use.

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The other two lectures focus on forms of sustainability concerning the use of resources. By analyzing the dynamics of hills and valleys in Lombardy, Stefano Bocchi (GeoLab, University of Milan) shows us, in areas that have been occupied for at least 6 to 7,000 years, that tools are necessary to analyze and diagnose the sustainability of these complex territories, both in terms of space and time. Historical data show that the increase of crops areas from the forests in the hills and valleys, is a function of the overall economic wealth of the population. Around the year 1000, a territorial revolution took place with high deforestation in order to create meadows. In the valleys of Lombardy, land occupation has traditionally been shared between cereals, grapes, livestock on the enriched meadows located on the valleys, in private property, and the conservation of natural meadows on the alpine hills, in collective property and devoted to transhumance. More recently, these valleys have experienced high rates of urbanization. This has resulted in the fragmentation of spaces at the expense mostly of meadows, and in recent decades, the cattle population has increased.

We are therefore facing a double problem of (i) a strong spatial stratification between the hills that are sometimes underutilized from an agronomical point of view, and on the other over-urbanized valleys (ii) a decrease in the sustainability of pastoral farming systems due to the overall decline in forage. The phenomenon of urbanization thus must be studied in relationship with the pastoral needs and decisions could be take to concile both land uses like the Swiss have done in the romand valleys by establishing pastoral zoning.

The relationship between urban agriculture and the quality of surface water are analyzed by Enrico Bonari and Nicola Silvestri (Land Lab of SSSA), in the example of Lake Massacuiccoli. In a watershed of about 12,000 ha (including more than 170,000 inhabitants), this lake of 690 ha reveals very significant levels of eutrophisation, salinisation and overexploitation, both in agriculture (irrigation in the southern zone) and urban discharges (two sewage treatment plants). These and other events, such as silting and the presence of invasive species (U.S. shrimp), question the future existence of this lake. The research team assessed a precise mapping of plots and agricultural and non-agricultural land uses, bounded sampling points and they analyzed the levels of nutrients in the water using some innovative tools. On average, the nitrogen supply in the lake is 120 t per year, of which at least 40% comes from agriculture, there are an average of 5.1 tons of phosphorus inputs per year, more than 60% coming from agriculture. If natural phenomena and the contribution of urbanization are not negligible, it is clear that peri-urban agriculture has a significant responsibility for the decrease of the quantity and quality of the lake water. To resolve this problem, changing cultures and cultural practices, accompanied by changes in marketing channels and in technical support (switch to hemp farming, hedges and grass

strips near the lake) are discussed: to be effective, these changes must be well motivated and applied across the lake basin as a whole. The territorial reorganization of agricultural systems is complex and would require strong forms of public policy, which currently do not seem to be in place.

Although they do not address all components of sustainability, these case studies show that the links between sustainability and urban agriculture are far from unequivocal: despite sometimes being an undeniable source of damage to natural resources, urban agriculture can also lead to the protection of the natural heritage that has been fragmented by urbanization. However to maintain its principal role of contributing to green areas around cities, urban agriculture must be at least liveable for farmers, which is not always the case. In terms of research and education, issues regarding sustainability in urban agriculture question and enrich the concept of sustainability itself. But they also argue for the relevance of tools and methods for territorial agronomy. In fact, analyzing territorial organization is central to both the diagnosis of current forms of sustainability and to possible proposals for resolving problems.

Integrating farm buildings in peri-urban land planning: a social issue[1]

Riassunto L'applicazione dei principi dello sviluppo sostenibile alle politiche francesi di gestione del territorio ha portato alla modificazione delle norme urbanistiche nelle aree agricole, limitando, di fatto, le possibilità degli agricoltori di costruire le abitazioni rurali. Nell'Herault, una provincia vitivinicola del sud della Francia dove esistono problematiche di accesso alla proprietà da parte delle aziende agricole, le amministrazioni locali cercano di attenuare questo problema proponendo un modello innovativo di concentrazione delle costruzioni rurali inclusa l'abitazione. Anche se è in grado di migliorare la logistica, questo modello modifica l'assetto sociale creando delle inattese problematiche di equità sociale e di giustizia spaziale.

Résumé L'application des principes de développement durable à la politique française d'aménagement territorial conduit à la modification des règles de construction en zone agricole qui touche en premier lieu les exploitations agricoles, réduisant de fait, la possibilité des agriculteurs d'y construire leur logement. Dans l'Hérault, département viticole du sud de la France où l'insertion spatiale des exploitations est aussi problématique, les acteurs institutionnels locaux cherchant à pallier ces problèmes tout en appliquant la loi proposent un modèle innovant de regroupement des constructions intégrant le logement des agriculteurs. Bien qu'il apporte des solutions logistiques, ce modèle modifie les sociabilités locales et fait alors surgir des problématiques inattendues d'équité sociale et de justice spatiale.

Introduction

Following the Earth Summit organised in Rio-de-Janeiro in 1992 by the United Nations which led to the creation of "Agenda 21", the European Union has set up a "European Strategy of Sustainable Development" (ESSD) which is outlined in the "National Strategies of Sustainable Development" (NSSD).

Based on the «Equilibres»[2] report concerning two major stakes - the fight against global warming and sustainable land planning - the French State has decided to play the role of *conductor* in order to implement sustainable development in France. In line with sustainable land planning, the control of urban sprawl is a priority. This involves reducing the consumption of agricultural and natural spaces, and re-establishing attractive yet sustain-

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[2] Equilibres: Prospective du rôle de l'Etat stratège face aux enjeux de développement durable (Commissariat général du plan, 2005).

able towns via a decrease in commuting, an improvement in access to services, the development of *slow traffic* and of green spaces in town. Thus, sustainable development induces land planning which, besides the objectives of economic viability and environmental protection, also integrates social equity, with actions against exclusion and an improvement in living conditions.

However, according to many authors, the social relations, in French peri-urban areas, are problematic. The social dynamics which develop in these areas are characterized by social relations based on avoidance (Baumgartner, 1988; Charmes, 2005), social and spatial segregation processes (Jaillet, 2004, Donzelot, 2004, Charmes, 2005), and an increasing number of neighbourhood and land use conflicts (Guérin, 2005; Torre et al, 2006; Bossuet, 2007; Darly, 2009). At the same time, the farmers who remain in these peri-urban territories have to deal with difficult conditions due to the cohabitation with an urban population and with other activities which are constantly and quickly renewed. Many studies have stressed the loss and fragmentation of agricultural spaces (Abrantes et al., 2009), pressures on the land and insecure rural tenancies (Jarrige et al, 2003), the development of recreational practices in productive agricultural spaces (Le Caro, 2008), different kinds of pollution and inconveniences due to proximity of inhabitations and farms (Caron, Torre, 2004). The above remarks highlight that the living conditions due to the cohabitation between different kind of inhabitants and activities is another kind of a social stake of land planning policies. This paper investigates the effects of the spatial organisation of farm building on the cohabitation between residents and farmers which illustrates a frequently forgotten stake of the sustainable urban planning which its liveability.

The social dimension of sustainable development is at the heart of the "Solidarity and Urban Renewal" law, also called the SRU law[3] which has directed French land planning policy. New principles such as social mix and social equity are used as guides for planning documents for peri-urban spaces. However, the social dimension is not taken into account in the agricultural component of these documents. Although the protection of agricultural spaces has become a new target of public action, agriculture is first mobilized for services relating to the city's landscape and environment. The fate of farmers and the maintenance of peri-urban farms are not taken into account either in these planning documents that prioritize open spaces, or in the agricultural sectorial policies which focus on the economy of the main production chains. Today, it is multiple local initiatives that are actually tackling these issues, via numerous stakeholders who develop projects without adhering to a unified chart of policy. The question remains whether the social dimension of sustainable development is effectively taken into

[3] Law n° 2000-1208, 13th December 2000, relative to solidarity and to urban renewal

account in planning actions related to peri-urban agricultural areas. Are the SRU law objectives taken into account? Or do they indirectly interfere in the construction of local solutions?

A case study in the south of France

In this article, we try to tackle these questions using a revealing example: the management of farm buildings in the peri-urban areas of a highly populated department in the south of France. In the Hérault, the antagonistic stakes of the protection of agricultural spaces and of farmers' housing have led State representatives to start a dialogue which has resulted in a proposal: the creation of "hameaux agricoles"[4], the grouping of new farm buildings, including professional buildings as well as farmers' dwellings. To study this situation, the methodology used combines a comparative analysis of "hameaux agricoles" projects in the Hérault and sociological and geographical surveys of farmers' and inhabitants' practices in selected "communes"[5].

In 2006, we carried out an inventory of the projects of "hameaux agricoles" in the Hérault department. On this basis we chose four "communes" which had a project for a "hameau agricole" and we analysed the spatial trajectories of sixteen farms (Lafage, 2006). In 2007, we carried out an investigation into the social effects of these projects on two contrasting "communes": one characterized by a traditional housing structure and one which had implemented two "hameaux agricoles" projects in the last fifteen years. Fifty nine sociological interviews were carried out with 27 farmers and 32 other inhabitants (Candau, Nougarèdes, 2008). In 2009, we updated the inventory of the departmental projects (Salvetat, 2009) and analysed them within the framework of a research programme on the territorial governance of integrated territorial projects (Rey-Valette et al., 2009).

We will present the results of these case studies in two steps. Firstly, we describe the dynamics of the projects: their appearance, application, and local effects. Then we will analyse the transformation into social relations that resulted locally.

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[4] A "hameau agricole" is a new model for managing new farm buildings in the Hérault. The "hameau agricole" brings together new farm buildings in one area on agricultural land close to existing built-up areas. This new area is specified in the urban planning documents of the "commune".

[5] The "commune" is the smallest French territorial division. It can be a village or a town. The commune's territory includes residential areas, natural and agricultural spaces.

The "hameaux agricoles" projects in the Hérault

The emergence: towards a new model of urban planning

The department of the Hérault is characterized by two factors which help to explain the emergence of the "hameaux agricoles" projects: an important residential development and a crisis in the vine-growing sector. Firstly, the population growth of the area is one of the highest in France and the resulting urban sprawl occurs mainly in the plain, it is essentially viticultural, with some local parcelling of the landscape. Secondly, vine-growing in the Hérault has been experiencing a long-lasting economic crisis, which has facilitated the urbanisation of agricultural land via the sale of land by farmers who have stopped their activities or who have wanted to re-capitalize their farms. In addition, vine-growing in the Languedoc comprises a lot of small farms run by cooperatives. These small farms are traditionally located in the old centres of villages, which today are surrounded by suburbs. The difficulties of maintaining farms in the old parts of villages in undersized buildings with bad access, the need for expansion, has led farmers to building their farm buildings far away from the residential areas, often right in the middle of the their own agricultural land (Soulard et al., 2007).

The farmers' need for buildings outside of the village is in direct opposition to the principles of urban planning policies, which prescribe the continuity of built-up areas and the maintenance of existing open spaces. These two factors represent a constraint to farmers' development projects. State representatives and local authorities have thus tried to limit the granting of building permissions in agricultural areas. In the Hérault, they have initiated a dialogue with farmer representatives which have led to the conception of a new model of managing farm buildings called "hameau agricole", which is an institutional compromise (Jarrige et al., 2008). The objective is to promote the grouping of new farm buildings, which may or may not include the farmers' dwellings, into a dedicated agricultural area adjacent to the existing built-up areas.

These projects are managed by the municipality, via a land and regulation that allows the sale of plots of building land to farmers at prices between the agricultural and the building's value. At the same time the risk of speculation is reduced by direct re-selling via legal formulas, which require buyers to respect the land's agricultural assignment during a specified period. Lastly, financial and legal help are provided to the municipalities that develop these projects.

The implementation: multiform local projects

The first proposals for "hameaux agricoles" were drawn up in 2004. An inventory of the projects, carried out in 2006, identified 23 municipalities that had either started to consider or had carried out such a project. In 2009 another inventory identified 16 municipalities. In the mean time, three new projects appeared and 10 municipalities abandoned their projects, because of municipal team or policy changes or because of a lack of interested farmers.

Currently, only five municipalities out of 16 have carried out a project. Of these, only one has carried out a "hameau agricole" according to the model proposed: a set-up including farm buildings and homes for farmers. Two municipalities have simply grouped together farm buildings, without any dwellings. Two have adopted a more manageable solution by creating zones approved for farm building within the agricultural areas. Of the less advanced projects, four involve zones of mixed economic activities where the agricultural activity is included in zones with other economic activities. Finally, two projects have included social housing in the "hameau agricole".

The enquiries reveal the difficulties encountered by these projects and the slowness of their implementation. The initial model does not always adapt itself to local situations. Even when it is adapted, the difficulties of implementation are numerous, including land control, financial arrangements, and also the ability to initiate a dialogue between local representatives and farmers, as well as specific constraints due to the protected areas (coastal areas, flood risks). Lastly, the diversity of the projects leads to multiple forms of re-interpretation of the institutional model according to the social and geographical context.

The consequences: social relations transformed

As previously mentioned, only one municipality managed to carry out a "hameau agricole" project, creating a real agricultural quarter by grouping together twelve farms with farm buildings and farmers' dwellings. This municipality had already built a group of farm buildings in the 1990s. For the farmers who benefited from this first grouping, it improved their farms, which were initially trapped in the narrow streets of their medieval village. Problems of parking and of manoeuvring agricultural machinery were reduced, while traffic was improved because although farmers had to cross the village, they could choose more fluid traffic routes. The farmers also benefited from farm buildings that were more suited to their needs.

On the other hand, the first grouping of farm buildings changed the social relations within the village. It distanced the links with farmers that were not able to build there but strengthened solidarity links between farmers that benefited from the grouping. For the latter it led to the development of mutual help, technical dialogue and exchanges regarding the wine coo-

perative project from which farmers who did not build in the "hameau" felt excluded.

Social relations between inhabitants and farmers also changed. While the farmers established in the village adjusted their practices to avoid disturbing their neighbours (caution with working hours, times chosen for crop applications, the running of agricultural machinery, etc.), those who migrated to the grouped zone abandoned these adjustments around the zone. This was because it was not perceived by the farmers as a residential space but as a professional space dedicated to agricultural activity. Social relations with the residents living near by were reduced or avoided. The result was a concentration of pollution due to agricultural activity around the "hameau agricole", which was relatively problematic for the residents living close by. Noise and chemical pollution spread not only into gardens but also penetrated inside houses, imposing a continuous monitoring of comings and goings so as to protect themselves from pollution.

A new "hameau agricole" has just been finished. Compared to the first one, its conception has evolved by including dwellings for the farmers. This second project has modified the social relations on another level regarding social equity and access to housing. It offers farmers the possibility to acquire large plots of building land at a much lower price than the local price for building land. Some inhabitants have stressed the problem of access to housing which affects all inhabitants, including the young adults of families from the village.

Lastly, the mayor offered to include different types of housing within the "hameau agricole", such as social housing, with subsidised access to properties. Here the introduction of housing in the "hameau agricole" induced a shift from agricultural to housing policies, which caused a reaction from other socio-occupational categories with housing demands that were no less legitimate than those of the farmers.

The inhabitants, their reactions

Vine-growers with mixed reactions

Farmers' reactions to these projects have been mixed. Some regret that this policy obliges them to buy land to build farm buildings (although at a lower price), while they feel strangled by the wine crisis and would prefer to invest in agricultural production systems.

Others refuse the grouping effect which they perceive as a *ghettoization* of the profession and in deference to their quality of life, as expressed by one wine-grower who refuses *to force his family to live surrounded by tractors*. Others on the other hand, see these projects as an opportunity to modernise their farm, improve their farm buildings and maintain a strong dynamic of

mutual help. Some tenant farmers see it as a possibility of gaining access to property and to capitalize on their business. For those who own their farms, the project enables them to consolidate the family's real estate and wealth. Some declare openly that the "hameau agricole" represents a good financial transaction.

This list of examples shows the disparity of situations and points of view across the spectrum of farmers involved in these projects.

Indigenous residents close to the wine growers

Because of the extent of traditional wine growing in the region, the inhabitants from these villages all have links with wine growing, via a relative or a wine-grower friend, or because they themselves tend a vineyard that they keep for their leisure. Although they might not have an agricultural origin, they have a common culture fed by the memory of a time when farming dictated the rhythm of everyday life in the village. They therefore do not mind vine-growing, in fact they gain pleasure from it. They like the smells and noises produced by vine growing because it reminds them of the rural character of their village. For them the agricultural activity must be maintained in these villages and supported because it contributes to maintain the rurality and the social life of their village. They stress the fact that farmers are very involved in the social life of the village, and that maintaining the farms promotes a social mix and helps to avoid their village becoming a dormitory town. They do not see the grouping of farms in a "hameau agricole" as a good initiative. They perceive it as a form of social segregation. For them the development of "hameaux agricoles" is part of a global process, which tends to make *villages for rich people* from which they are excluded in the first place because of the inability of their children to settle in these villages. Lastly most end up by accepting these projects but only if they are carried out for the benefit of the farmers and not if they are implemented against their willingness.

Neo-inhabitants sensitive to maintaining farmers

Of the residents who arrived in the peri-urban areas, some tried to establish themselves in a village because it matched their ideal living environment for family life and for their children's education. They seek to become integrated through many different ways for example by participating in leisure activities and supporting local businesses. They are not very sensitive to the pollution linked to agricultural activity because this activity is part of their conception of the rural character of the village. Their relationships with farmers are occasional but they like the presence of farms. They agree with projects such as "hameaux agricoles" in order to support agricultural activity. However they remain vigilant about the potential risks of speculation,

not forgetting the price they had to pay to set themselves up in their village. Some are, nevertheless, rather more critical because they find it inequitable that one occupational category should be favoured, especially taking into account the fact that some farmers can benefit from the project while already owning real estate. They have doubts about the reciprocity of the solidarity that is asked of them.

Neo-inhabitants that are not sensitive to the agricultural matters of the municipality

For other new inhabitants, their living environment is restricted to their home, their private space. More than choosing a village, they chose a house or a convenient location. For some an improvement of their home requires a more spacious living space, a private garden and, if possible, a location that provides isolation in order to preserve the intimacy of their family life. Others place more emphasis on the accessibility of places outside the village, which they use for their activities or their children's. The majority of these residents lives in the suburban part of the village and is not very interested in village life. Some develop relationships with neighbours, however they do not develop more relationships with farmers than with other inhabitants and while not very interested in agricultural activity they are not hostile to it either some compare it to other sources of pollution, while others are more sensitive to anything that could deteriorate their quality of life. They can quickly rally collectively to act against farmers who pollute. Some residents consider themselves enable to judge the relevance of these "hameaux agricoles" projects and are not interested in them. Others support them because they see them as a vital part of the landscape and of their living environment and as such, they need to be maintained. However they are particularly concerned about the risks of land speculation. In fact, the inhabitants, whose living environment is essentially restricted to their home, or who place more emphasis on the accessibility of places outside the village, tend to have a distant detached view on agricultural affairs.

Conclusion: social equity and spatial justice, conditions for a sustainable management of farm buildings

Given that the implementation of the SRU law questions the management of new buildings in agricultural areas, it raises unexpected issues. It highlights a new problematical question: the management of farmers' residences. The integration of their dwellings in the first "hameau agricole" project led to a shift of perspective from an agricultural issue to a housing issue. This subsequently raised questions of social equity, which in a sense were pre-existing, but were made visible by these projects. This raises the question of whether the local institutional stakeholders who initiated the

model have the skills to deal with this shift in perspective.

This problem of social equity is perceived by the inhabitants and by the farmers themselves. It also appears in the actions of local and state representatives who make their decisions and manage their projects in relation to feedback from the population. Thus, in one of the municipalities studied, the "hameau agricole" project has been changed into a residential quarter welcoming different types of people. In another municipality, a project for a zone where agriculture would be mixed with other economic activities was rejected because it offered more advantageous conditions to farmers than to other financial stakeholders. Where other social categories have to justify their level of income to be able to benefit from specific subsidies, professional status alone gives farmers an undoubted advantage. This advantage is given to farmers who sometimes already own property, and this thus gives rise to feelings of injustice among other inhabitants.

When up until now, farm buildings have essentially been the target of management measures related to productive needs, architectural and landscape integration, or sanitary and environmental norms, the objective of protecting peri-urban agricultural areas raises questions of social equity and spatial justice in terms of the new socio-spatial modes of farm building management.

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Agro-ecological dynamics of mountain agricultural systems in Lombardy, Italy: the case study of Valtellina Valley[1]

Riassunto Tecniche fotogrammetriche, telerilevamento satellitare e modelli ecologici sono stati utilizzati per quantificare i cambiamenti di copertura del suolo tra il 1980 e il 2000 e per monitorare le dinamiche recenti di produttività (PPN) dei prati permanenti della Valtellina. I risultati indicano una riduzione significativa delle superfici agricole ed un forte incremento delle superfici urbane, principalmente legato alla diminuzione dei prati permanenti. Le mappe di PPN tra il 2002 e il 2007 mostrano che i prati meno produttivi sono generalmente localizzati in prossimità di aree caratterizzate da forte diminuzione delle superfici a prato nell'ultimo trentennio. In sintesi, la combinazione di un'analisi storica delle dinamiche paesaggistiche e di un monitoraggio delle attuali dinamiche di produttività degli ecosistemi può offrire interessanti prospettive per una migliore gestione e conservazione degli ecosistemi nelle Alpi.

Résumé Photogrammétrie aérienne, télédétection satellitaire et modèles écologiques ont été utilisés pour quantifier les changements dans la couverture des terres entre 1980 et 2000 et pour suivre les récentes dynamiques de la productivité (PPN) des prairies permanentes en Valtellina (Alpes du Sud). Les résultats indiquent une réduction significative des terres agricoles et une forte augmentation des zones urbaines, au détriment des prairies permanentes. Les cartes de la PPN entre 2002 et 2007 montrent que les prairies moins productives sont généralement situées près des zones caractérisées par une forte réduction de la couverture des prairies au cours des trois dernières décennies. En résumé, l'intégration d'une analyse historique des paysages et le monitorage de la dynamique actuelle de la productivité des écosystèmes pourraient ouvrir des perspectives intéressantes pour améliorer la gestion et la conservation des écosystèmes dans les Alpes.

Introduction

Agricultural land in the European Alps has been undergoing abandonment since the Second World War in connection with the marginalization of traditional farming systems (Batzing, 2003). The industrialization of agriculture and the implementation of the Common Agricultural Policy (CAP) have led to the progressive intensification of agriculture on more fertile and accessible areas, usually located in the low lands, at the expense of marginal and less productive areas, typically situated at higher elevations and with more limited accessibility (MacDonald et al., 2000). Such changes

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have involved several environmental and socio-economic modifications, which ultimately have affected not only the ecosystem goods and services provided by traditional agricultural practices, but also how the ecosystem *functions*, or the internal regulation of ecosystems. In this context, the study of land use/land cover changes can be extremely useful for understanding past conditions and current trends, and for formulating future scenarios for agricultural land development. In the European Alps, the integration of the understanding of long-term processes and the implementation of specific strategies to monitor agro-ecosystems is an effective tool to support land management policies (Boschetti et al., 2007; Fava et al. 2009). Remote sensing data, from aerial photographs to satellite images, together with agro-ecological models, can significantly contribute for both purposes (Kerr et al., 2003), since they provide a synoptic, multi-scale and recurrent source of information about land cover and surface biophysical properties.

In this paper, we use the Valtellina Valley (Italy, Southern Alps), as a representative and relevant case study in the European Alps. It is a mountain region affected by agricultural abandonment/ intensification in relation to the decrease of traditional farming systems and the expansion of human settlements. We utilized aerial colour photographs from the years 1980 and 2000 to characterize the land cover changes throughout the study area, and to identify the most important dynamic processes occurring in this period. Following the results of a previous analysis, we focused on permanent hay meadows and tested the use of MODIS satellite remote sensing data and radiation use efficiency (RUE) models in order to monitor recent meadow net primary productivity (NPP).

Methods

Study area

The study area covers 120 km^2 and is located in the bottom valley of medium Valtellina (46.10′ N, 9.50′ E), northern Italy. The bottom valley is mainly flat (slope < 5%) with an east-west orientation and an elevation ranging from 250 to 380 m a.s.l.. Geologically, its "U" shape features resulted from erosion and deposition during the Quaternary with sediment accumulation in the less steep areas. The main soil types are Eutric Fluvisols, Dystric and Eutric cambisols (FAO, 1998). The climate is temperate-continental with mean annual air temperature values of 11.9°C and a mean annual precipitation of 970 mm, registered at the climate station of Sondrio (1973-2007) (46.10′ N, 9.50′ E; 298 m a.s.l). The features of Valtellina Valley have origins in the traditional Romanic culture, characterized by a self-sufficient mixed farming system practiced by villages in the low lands, in

the sub-alpine pastures and in the summer settlements at higher elevations during transhumance (Maurer et al., 2005). The land structure is fragmented into small-size parcels due to the prevalent hereditary partitioning systems of parcels (Batzing, 2003). This strongly affected the shape of the landscape until the beginning of the 20th century, when socio-economic changes led to the gradual abandonment of these systems.

Land cover change analysis

Analyses of land cover changes were derived from the combination of image photogrammetric processing, geographical information systems and spatial statistical analysis. We defined 11 land cover classes (permanent meadows, orchards, water, urban settlements, industrial settlements, vineyards, hedges, uncultivated, cultivation, roads, woody), adapting the European Nature Information System (EUNIS) habitat classification (http://eunis.eea.europa.eu/habitats.jsp) for the study area. Hand-digitizing processing was performed over two digital ortho-rectified aerial photos for the years 2000 (scale 1:36 000) and 1980 (scale 1:20 000) in ArcGIS 9.1 (ESRI 2004). The aerial photos (1m resolution) were acquired from the regional administration of Lombardy. They were registered and geo-referenced to the national grid system Gauss Boaga- Zone 1. The image processing resulted in two land cover maps for the years 1980 and 2000 in vector format.

In order to quantify the land cover transition during the period of analysis, both vector maps were transformed into raster format in ArcGIS 9.1 (cell size 10m) and exported to the Idrisi Andes GIS environment (Clark University 2006). Subsequently, a post-classification change detection technique was applied, based on a cross-tabulation algorithm (Lu et al., 2004), which executed a cross-correlation between the two independent classified images (1980/2000). The resulting cross-tabulation table identified the frequencies of classes that remained the same (frequencies in the diagonal) or have changed (off-diagonal frequencies).

Net primary productivity analysis

In order to monitor the dynamics of the net primary productivity of hay meadows in the study area, we integrated the MODIS (*Moderate* Resolution Imaging Spectroradiometer) satellite data and radiation use efficiency (RUE) model MOD-17 (Running et al., 1999). The algorithm used for generating the MODIS NPP standard product was modified to increase the spatial resolution of the NPP estimates from 1 km to 250 m, which is affected by the complex topography and fragmentation of the study region. A brief description of the most important methodological steps follows, while an exhaustive description can be found in Colombo et al. (2009). The basic formulation of the model is as follows:

$$GPP(t) = [\varepsilon_{max} \cdot f(T_{min}).f(VPD)] \cdot fAPAR(t) \cdot PAR(t) \quad \text{[Eq. 1]}$$

where GPP [gC day^{-1}] is the gross primary productivity, ε^{max} [gC MJ^{-1}] is the maximum radiation use efficiency coefficient, f (Tmin) and f (VPD) are scalar functions [0,1] of the minimum daily temperature (Tmin, °C) and vapour pressure deficit (VPD, Pa), introduced to keep account of the reduction in ε^{max} due to non-optimal growth conditions. From daily GPP values, net photosynthesis (PSNnet, gC day^{-1}) is obtained by subtracting the maintenance respiration. NPP is estimated annually as the cumulative sum of PSNnet less the cost of annual maintenance and growth respirations. The model requires several eco-physiological parameters specific for grasslands. The detailed list of parameter values used in this study can be found in Colombo et al. (2009). According to Eq. 1, the model input variables are the fraction of photosynthetically active radiation absorbed by plants (fAPAR), the incident PAR [MJ m^{-2} day^{-1}], and the minimum, maximum and mean temperature values, used to derive the scalar functions f (Tmin) and f (VPD). Daily PAR values were obtained from incident global radiation (GRAD) measurements at the Sondrio meteorological station, applying an empirical relation (PAR=GRAD*0.48, Tsubo and Walker, 2005). Temperature values were obtained from the same station. Lastly, fAPAR values were obtained from the Normalized Difference Vegetation Index (NDVI), derived from MODIS satellite data, using the empirical relationship proposed by Sellers et al. (1994). NDVI time series were generated from the standard 16-day 250m spatial resolution MODIS vegetation indices product (MOD13Q1), downloaded for the period 2001-2007 from the NASA Warehouse Inventory Search Tool (WIST https://wist.echo.nasa.gov). To exclude low quality data and reduce noise in the NDVI time series, the filtering algorithm proposed by Chen et al. (2004) was used. Lastly, a linear relationship between consecutive observations was assumed in order to obtain daily NDVI data for the whole study period. The output of this procedure is the hay meadows daily GPP and PSNnet, and annual NPP maps, over the whole study area.

Results and discussion

Land cover change 1980-2000

The land cover analysis revealed an important decrease in agricultural land in favour of land cover types connected with the secondary and tertiary economic sectors. As shown in Table 1, in the earlier date (1980) the landscape of Valtellina was largely covered by agricultural land (66%), mainly hay meadows (36%) and vineyards (17%). Human settlements (urban, industrial, roads) covered approximately 17% of the area. In the later date (2000), the overall composition of landscape did not change radically: agricultural

land was still the main cover type (55%) and human settlements were the second most represented land use class (23%). Nevertheless, during the period of analysis, the ratio between agricultural land and human settlements changed from 4/1 to nearly 2/1, suggesting significant urbanization and loss in agricultural land.

In fact, the land cover change analysis showed a net land cover conversion in 22.8% of the bottom valley, with a mean change velocity of 88.7 ha $year^{-1}$. Looking into the nature of this change, results indicated a strong tendency to the reduction of permanent meadow lands (-539 ha), which represents about 30% of the overall converted area. Moreover, we observed a decrease in vineyards (-276 ha), an increase in urbanized surfaces (+333 ha), industrial settlements (+140 ha), uncultivated land (+146 ha), and woody land (+215 ha) (Table 1). Considering the agricultural land overall, we estimated a loss of 846 ha, contrasting with the gain of 496 ha in human settlements.

These results identify a clear dichotomous trend in land cover: the retreat of agriculture land and an increase in human settlements, which transformed the Valtellina landscape during the period of analysis. These tendencies of urban expansion and the conversion of traditional agricultural systems mainly affected the hay meadow cover, which accounted for 54% of urban and 63% of industrial growth (Table 2 and Figure 1), as already reported in the Alps (Peter et al., 2008).

Another notable result is the net conversion of agricultural land to woody (234 ha) and uncultivated (152 ha) areas (Table 2). Recent studies in mountain regions related this process to agricultural abandonment in marginal high elevation or slope areas (Rutherford et al., 2008). However, in this case study, the same tendency trend was observed in the bottom valley. If confirmed by other studies, this result would highlight a relatively new trend of agricultural loss, even in the more fertile and favourable areas.

Overall, the fast decline in permanent hay meadow cover is strictly associated with both processes, and represents the most important agro-ecological change impacting the area. Meadow loss and decline is a particularly damaging agro-ecological process, because of the well-recognized multifunctional role of grassland ecosystems in the European Alps (e.g. high quality local forage provisioning, biodiversity maintenance, carbon sequestration, soil erosion protection, tourism and recreation) (Becker et al., 2007; Peter et al., 2008).

Land cover type	1980		2000		
	Area (ha)	Proportion (%)	Area (ha)	Proportion (%)	Area (ha year $^{-1}$)
Per. Meadow	29159	36,4	2377	29,7	-26,9
Cultivation	350,9	4,4	377,9	4,7	1,4
Orchard	610,8	7,6	552,7	6,9	-2,9
Vineyard	1396,2	17,4	1120,2	14	-13,8
Woody	860,5	10,7	1075,1	13,4	10,7
Uncultivated	164,4	2,1	310,2	3,9	7,3
Water	333,4	4,2	319,8	4	-0,7
Urban	978,8	12,2	1311,5	16,4	16,7
Industry	170,7	2,1	310,5	3,9	7
Roads	211,1	2,8	244,5	3,1	1,2
Hedgerow	6,4	0,1	9,3	0,1	0,1
Total	8009,1	100	8009,1	100	-

Table 1: land cover type area, proportion and changing rate between 1980 and 2000.

1980/2000	Per. Meadow	Cultivation	Orchard	Vineyard	Woody	Uncultivated	Water	Urban	Industry	Roads	Hedge-row	Total 1980
Per. Meadow	2092,32	194,25	65,61	17,45	153,14	89,79	5,64	184,49	90,7	18,13	4,34	2915,86
Cultivation	108,55	140,47	3,92	2,97	21,02	31,95	1,45	20,38	16,13	3,17	0,88	350,89
Orchard	60,82	9,79	436,91	11,08	17,04	6,31	0,02	60,73	6,17	1,78	0,14	610,79
Vineyard	63,76	18,93	41,53	1069,62	90,5	48,69	0,03	60,52	0,21	2,43	0,05	1396,24
Woody	21,17	8,48	2,06	0,691	722,23	47,32	8,6	12,12	19,39	2,51	0,66	860,49
Uncultivated	18,1	3,6	0,6	0,088	42,49	66,37	3,47	8,8	16,14	3,07	0,07	164,38
Water	1,65	0,27	0,17	0	17	12,77	297,5	0,47	2	0,94	0,63	333,43
Urban	5,95	0,55	1,24	1:32	4,64	1,01	0,21	958,73	8,79	6,29	0,09	978,82
Industry	1,87	0,62	0	0	3,97	4,9	2,77	5,21	149,74	1,58	0,12	170,68
Roads	1,41	0,35	0,47	0,15	1,21	0,65	0,07	10,39	1,34	204,6	0,49	22&,10
Hedgerow	1,42	0,6	0,19	0	1,89	0,43	0	0,04	0,01	0,01	1,83	6,42
Total 2000	2377,02	377,91	552,7	1120,21	1075,13	310,19	319,8	1311,9	310,52	244,5	9,3	8009,1

Table 2: land cover change matrix from 1980 to 2000.

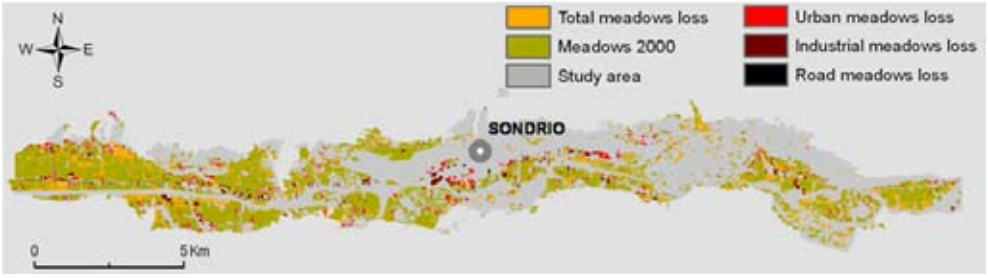

Figure 1: hay meadows conversion to urban, industry and roads between 1980 and 2000

NPP monitoring 2002-2007

Productivity can be considered as a reliable indicator of ecosystem conditions and is directly linked to the economic value of a specific crop (Hassan et al., 2005). A cost-effective methodology for monitoring hay meadow NPP at a landscape scale was implemented in Valtellina, as a tool to provide up to date information on the status of hay meadows in the area.

An example of measured NDVI and modelled GPP curves for a single 6,25 ha image pixel and a single year is shown in Figure 2. The seasonal profile of GPP has a multiple peak distribution, likely related to the effect of cut meadows. Annual NPP maps were generated from daily GPP data, accounting for maintenance and growth respiration. Estimated mean annual NPP values in the study area ranged from 8,5 t ha^{-1} in 2004 to approximately 10 t ha^{-1} in 2001, with maximum values reaching 14,4 t ha^{-1}. Although a quantitative validation of these results was not possible, the values obtained are comparable with those presented by Riedo et al. (2000) in the Swiss Alps. NPP temporal trends were not observed in the study period. However, the temporal variability of the mean NPP significantly correlated with cumulate precipitation between the start of February and the end of August ($r=0,92$, $p<0,001$), indicating the key role of rainfall in the study area.

Spatial maps of averaged NPP over a 5-year period (2003-2007) were generated to highlight areas with low productivity, probably abandoned or in poor condition (Figure 3). A strong spatial variability was observed, but generally negative anomalies resulted in isolated and fragmented meadows, suggesting a potential connection between meadow fragmentation and declining conditions in the area. Moreover, a comparison of the meadow loss (Figure 1) and NPP (Figure 3) maps showed that less productive meadows were generally located in proximity to areas characterized by loss of meadows in the years 1980-2000.

Although the methodology proposed needs validation and suffers from the limited spatial resolution of MODIS data, which may not be suitable in highly complex Alpine landscapes, the results obtained are promising and open up interesting perspectives for future applications.

Conclusions

Agricultural land cover trends in the Valtellina bottom valley illustrate that the set of agricultural policies implemented according to the EU PAC are probably not the most suitable for the local reality. Agricultural land has been seriously reduced between 1980 and 2000, in connection with the strong expansion of human settlements. Permanent hay meadows were particularly affected by this process. Due the important ecosystem services provided by this ecosystem, such tendency denoted a reduced interest in the conservation of agriculture used lands.

The combination of land cover analysis with remote-sensing derived NPP data proved to be effective in relating land cover trends and ecosystem status, which is an essential task for ecosystem monitoring and for implementing effective conservation policies in the European Alps.

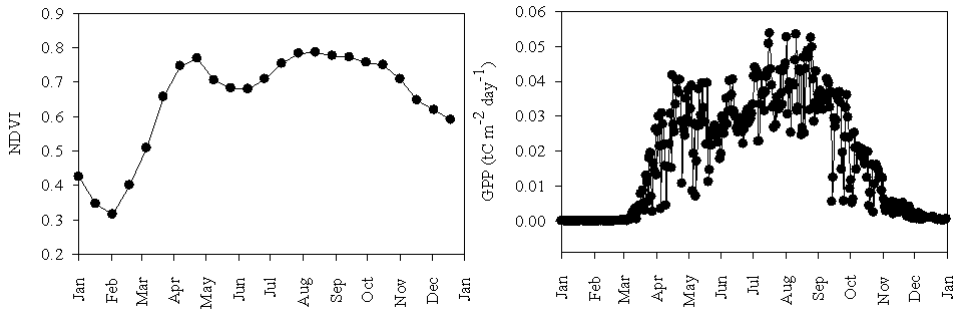

Figure 2: measured MODIS NDVI (left) and modelled GPP for a single image pixel in 2006

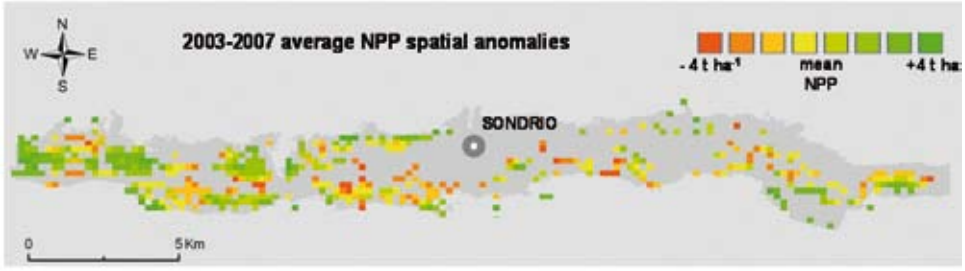

Figure 3: 2003-2007 average NPP anomalies

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Peri-urban agriculture and water quality. Phosphorus pollution in Lake Massaciuccoli[1]

Riassunto La presenza di aree di transizione fra città e campagna costituisce un'opportunità per accrescere la sostenibilità dei sistemi urbani. L'organizzazione di queste aree può giocare un ruolo importante nel favorire un riequilibrio ecologico dei centri residenziali attraverso la possibilità, che le aree ad agricoltura peri-urbana offrono, di fornire risorse utili alla ciclizzazione delle sostanze di scarto e al miglioramento della qualità di vita delle comunità residenti. A scopo esemplificativo si riporta il caso del comprensorio del lago di Massaciuccoli (Toscana, Italia) in cui la corretta gestione delle vaste aree agricole presenti all'interno di un territorio fortemente antropizzato può contribuire significativamente alla risoluzione dei problemi di eutrofizzazione delle acque del lago, attraverso l'adozione di interventi gestionali e/o strutturali. La parziale riorganizzazione dei modelli agricoli esistenti non è priva di costi, né di difficoltà, ma costituisce probabilmente la strategia meno invasiva e dispendiosa per conseguire un effettivo miglioramento ambientale nell'intera area di interesse.

Résumé La présence d'espaces de transition entre ville et campagne est une opportunité pour accroître la durabilité des systèmes urbains. L'organisation de ces espaces périurbains peut favoriser un nouvel équilibre écologique des espaces résidentiels au travers de l'agriculture pouvant assurer des ressources, l'utilisation de certains déchets et une amélioration de la qualité de vie pour la population résidente. Un exemple est le secteur du Lac de Massaciuccoli (Toscane, Italie) où une bonne gestion des espaces agricoles périurbains au sein d'un territoire très habité peut contribuer à résoudre les problèmes d'eutrophisation des eaux du lac au travers d'interventions à la fois d'ordre technique et structurel. La réorganisation des systèmes techniques existant présente des difficultés et des coûts, mais elle semble être de loin la stratégie la moins envahissante et la plus économe pour une amélioration environnementale de ce secteur.

Introduction

The conventional distinction between the town and countryside, which marked the development of human communities during the 20th century, has moved over the last decades to a progressive interpenetration between urban and rural areas. Zones far from the towns have been subject to a gradual but repeated "contamination" with the neighbouring rural areas. This had led to degradation in vocational agricultural areas following a continuous, yet non-monotonous gradient.

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The consequences of these new territorial setups are evident in the vast peripheral areas where agriculture resists in spite of its contacts with urbanization, while retaining its own functions (productive, but also recreational, landscape, social, etc.). Thus there has been a fusion between agriculture and residential structures, which has led to even more original organizational forms, which are very different from each other. The void which has traditionally separated town and country has been filled with mixed settings where either urban or rural traits may be dominant, which compliment each other rather than exclude each other.

Such transition areas may also play an important role in increasing the levels of sustainability and autonomy of urban systems, thus contributing to the functions associated with an ecosystem (cycling of the matter, creation of structured trophic chains, energy self-sufficiency). To deal with such issues, the boundaries of urban areas are generally expanded to include auxiliary areas. These are not topologically associated with urban domains, but they are essential to the survival of towns as they allow for the provision of the resources required and/or ensure the disposal of residues that cannot be dealt with *in situ*.

There is thus a dilution of activities concentrated on limited areas which, otherwise, would not be able to bear the ecological and environmental "weight" of the activities performed throughout the territory.

The presence of large transition areas between the town and country may therefore be an interesting alternative, aimed at increasing the degree of autonomy of urban systems while also seeking solutions to reduce urban dependence on neighbour areas. The role played by peri-urban agriculture is worth noting, as it contributes to increasing the level of sustainability associated with anthropic systems both via the production of resources (food, renewable energy, etc.), and waste recycling (phytodepuration, filtering, etc.). In addition, there is the human wealth that can be derived from agricultural activity in terms of social functions, the narrowing of supply chains, the broadening of the cultural identity of inhabitants, a reduction in transportations, and the containment of depuration costs, etc.

Role of agriculture in peri-urban areas

Agriculture may thus play an important role in re-balancing peri-urban areas, thus limiting the external dependence on goods and energy and favouring the recovery of undesirable substances. In order to achieve this, cultivation systems need to be redeployed. This would be helped by the possible flexibility in the organization of rural zones, compared to areas assigned to other uses such as residential housing, service and communication networks, and commercial organizations.

Peri-urban agricultural systems are characterized by specific and largely "unknown" conditions of conventional agronomy. Hence, they require a different approach to solving environmental and management issues, which are more complex when compared to rural agricultural areas. The special features of peri-urban agricultural areas may be essentially categorized into three basic patterns:

- They present contamination sources that are typical of both urban and agricultural environments; the multiplicity of the possible causes of pollution makes it more difficult to quantify the contributions and attributing responsibilities of each of the interested actors. Moreover, contamination sources may interact with each other, thus making the situation even more complex;
- Peri-urban areas are characterized by the presence of a notably higher population density than conventional agricultural areas, which makes the social composition of reference communities more complex and varied, with groups of interests that differ in terms of typology, needs and cultures. Such circumstances involve, on the one hand, focusing on all aspects associated with the quality of life and human wealth. On the other hand, these circumstances may lead to sustained social conflicts, thus making it more difficult to identify agreed and shared solutions;
- The agricultural production patterns in the peri-urban areas are typified by a larger heterogeneity both in terms of farm management and organization. The co-existence of professional and part-time farmers with amateurs, through a roughly continuous gradient of intermediate solutions, makes any attempt to generalize difficult and complicates the dialogue with sector operators.

Management of peri-urban areas

The allocation of available resources is one of the key mechanisms in governing the development and growth of the various components represented by the peri-urban agricultural areas. Taking relevant decisions is therefore necessary to assess both the problems associated with the demand for resources, and those concerning deterioration i.e. the conditions of the resources when "given back" to the same territory from which they were taken.

In the past, land availability was one of the most limiting factors in modulating the evolution of human communities in the context of the territory, while also promoting the search for innovative operational and organizational solutions (e.g. taller houses or allowing the borders of town to spread into residential areas that may be far from the urban centre). Nowadays, on the other hand, water supplies are strategically important in modulating

developmental dynamics. In several cases this represents the main constraint to urban expansion or to the execution of effectively sustainable agriculture (from both a financial point of view and the conservation of natural habitats that have shallow water bodies, namely rivers and lakes).

Therefore although water resources may not always be in direct competition (this is because supply sources may be different in relation to the quality conditions required), it is also true that on the way back to the respective "reserve pools" (lakes, rivers, seas, water tables), it ends up mixing water outflows from the various activities where water is used. This then leads to the final qualitative and quantitative conditions of reception bodies.

In these situations the presence of farmers in large areas of territories may be a valuable resource for implementing water protection strategies. A conservation-oriented agriculture may help to mitigate several degradation phenomena and water waste. Moreover, the opportunities offered by using vegetation in terms of depuration (phytodepuration, vegetation filters, wetland, etc.) are extremely interesting, thus confirming how agriculture again represents the most acceptable and cost-effective form of land management.

Lake Massaciuccoli: a possible case-study

The district of Lake Massaciuccoli (central-western Tuscany, Italy; 43° 49′ 59.5′ North latitude; 10° 19′ 50.7′ longitude East) is an exemplary case-study for investigating the role played by peri-urban agriculture in the qualitative and quantitative management of water resources. Its hydro-graphic basin extends over an area of 114 km^2, delimited to the north by the river Camaiore, to the east by the reliefs of d'Oltre Serchio Mountains, to the south by the river Serchio and to the west by the Ligurian Sea (Figure 1).

The lake extends over about 13 km^2 in a large depression of a depth varying between 1.0 and 2.5 m (Amos et al., 2004) and contains a water volume of about 14 Mm^3 (Autorità di Bacino del Fiume Serchio, 2007), fed by modest tributaries characterized by a pluvial regime and descending from the hills in the east, and by water from neighbouring soils, drained over centuries and now largely used for agriculture.

These latter areas are below sea level, and the lake represents a walled water basin over a length of 16 km with barriers of 0.5-0.6 m above sea level. Draining pumps, indispensable for preserving an effective soil depth, are planned in order to maintain deep waters at a minimum depth of 1.0 m from the surface, thus allowing all main farm practices to be developed. The draining process was and still is the main cause of the subsidence in areas near to the lake, characterized by peaty soils. It was in these soils that, over the last 65 years, lowering phenomena were observed down to > 3 m from the surface, the average rate being 3.9 cm/year.

From an administrative viewpoint, the basin lands extend over the provinces of Lucca (the municipalities of Massarosa, Viareggio, small parts of Lucca and Camaiore, up to and including the hamlets of Quiesa, Bozzano, Massaciuccoli, Piano del Quercione, Piano di Mommio, Montramito and Torre del Lago) and Pisa (municipality of Vecchiano, including the hamlets of Vecchiano, Nodica and Migliarino). The residential population is estimated to be around 46,700 (Pagni et al., 2004).

Two water depuration plants are located in the hydro-graphic basin, relating to the built-up areas of two local municipalities (i.e. Migliarino, ca. 4250 AE, and Vecchiano, ca. 8500 AE), which discharge their effluents to the lake.

Figure 1: the hydro-graphic basin of Lake Massaciuccoli (in yellow).

Regarding businesses within the district, since the 1960s, there has been an important industrial area, predominantly manufacturing,, which is currently expanding.

Agricultural activities cover 40% of the district, thus testifying the importance of such activities for the territory today. Professional farms, located nearby the lake, are mainly of an average-large size (50-70 ha) and aimed at cereals and industrial productions, maize being the central crop, followed by winter cereals and sunflower. Horticulture and olive trees are also significant, although only in limited areas. Non-professional farmer-managed farms are of a small size (3-5 ha), and located in parcels near town centres (Figure 2). The main activities include family-run gardens and orchards (mixed crops), and small leguminous cultivations (grain and/or forage crops), or winter-cycle horticultural crops (spinach, cauliflower, etc.).

Figure 2: year-2008-land-use in a section of the southern side of the hydrographic basin of the lake.

The basin is also crossed by a nationally important network of roads and railways, such as the Genoa-Rosignano highway, Florence-mare highway, Lucca-Viareggio highway, the Aurelia, Genoa-Pisa and Lucca-Viareggio railways, and other secondary and local roads.

Eutrophication of the lake: a multi-source problem

Lakes were first investigated in the 1940s (Brunelli and Canicci, 1942; Lapucci et al., 1964; Salmoiraghi and Carusi, 1981; Simoni et al., 1992). Besides factors regarding hydraulic security, sedimentation and increasing salinization, there was evidence of a gradual deterioration in the nutritional standards of the water, as confirmed by more recent research and observations of fish poisoning (Simoni et al., 1984).

Considering the importance of the area (largely covering Tuscany's Natural Park and including some sites of national and EU-wide interest), multi-disciplinary research has continued since 1990, more specifically aimed at the evaluation of water resources (Cenni, 1994; Cenni, 1997; Cenni, 1999). Based on these investigations, the role played by phosphorus on eutrophication was also highlighted.

Recent results (Silvestri et al., 2010) proved that phosphorus-based contamination of lake water is most likely associated with human activities (agriculture, civil discharges, mechanical draining, etc.), or natural phenomena (mineralization of soil organic matter, water-driven shallow and deep transport processes, etc.). Interestingly, human activities (if continually performed) contribute to worsening the natural phenomena.

Regarding other sources of contamination, the natural contribution is the largest. The mineralization of organic matter occurring over the peaty soils around the lake (also confirmed by the above macroscopic subsidence phenomena) in fact represents the potentially largest source of phosphorus contamination. Losses associated with phosphorus fertilization on the other hand, tend to manifest themselves erratically. Their amounts largely depend on the distributional characteristics of fertilisers and on the possible interactions with high rainfalls. Lastly, phosphorus flows from depuration plants are quantitatively not negligible. However, they represent a relatively minor contribution compared to the other sources mentioned above, and they only affect limited area. This is demonstrated by high values of phosphorus concentration as measured at the outlet of downstream drain networks.

The role of agriculture

The investigations of the last 20 years highlight a gradual extensification of agricultural practices, particularly towards a drastic reduction in the use of mineral fertilisers (which have also become too expensive in recent years in relation to grain market prices). Based on the latest direct investigations, average doses of phosphoric fertilisers used in the district are relatively low (43 kg P_2O_5/ha, equivalent to 19 kg P/ha), and often lower than needed to compensate for crop removal. Although this may not mean that nutrient

losses from fertilisation are totally absent, this would thus classify agriculture as P-depauperating activity (from the water-soil system), which, overall removes rather phosphorus from the system rather than adding to it.

Further containing the already low amounts of fertilisers used by farmers thus does not seem a feasible way to reduce phosphorus losses from cropped fields. A more conservative management of agricultural soils is instead recommended, above all aimed at a more tangible reduction of both the mean annual mineralization rate of soil organic matter, and the removal/detachment of soil particles and their erosion.

Both such objectives can be achieved by farmers adopting minimum tillage techniques (including direct sowing) rather than conventional ploughing, and/or timing the preparatory tillage nearer to sowing in order to expand, over time, the protective action of previous crop residuals. A further option to contain oxidation processes may be provided by introducing multiannual crops in the cropping patterns of the district (forages, energy crops, etc.). The goal in such cases is to limit soil manipulations via a less frequent tillaging. Rotational patterns could also include cover crops that can protect the soil surface during the fallow period.

The way technical itineraries are managed on each crop – and on the overall cropping system – may also considerably affect the efficiency with which the phosphorus is spread, which is the fraction of the removed element which currently contaminates the lake. Efficiency values (estimated as ratios between theoretical charges of phosphorous characterizing the sources and the amounts actually delivered to the lake) currently vary between 10 and 20%.

Potentially efficient measures in farming are possibly those that limit the movement of nutrients from cropped fields to the ditch system, for instance, the creation of grass or woody buffer areas. In terms of districts, the implementation of strategies may require the cooperation of territory managers, but should involve farmers too. Farmers could, for instance, allocate a portion of their own farm for this purpose (also using, for instance, the same 10% of usable surface already allocated to mandatory set-aside).

Constructed wetlands could be an option. These are soil surfaces occupied by canes (*Phragmites*, *Typha* or other species) and flooded by the waters that are going to be treated. Such solutions do not generally require the cutting and removal of biomass, and are able to retain the phosphorus in alternative forms. However further releases of the nutrient cannot be ruled out as chemical-physical and biological conditions of the plant-soil system change (e.g. due to the senescence of plant structures).

Likewise, vegetation filters are provided by plantations of woody biomass species (e.g. poplars or willows) where the crops are managed via short-term coppicing (two-three years) and are carefully irrigated using the waters that are going to be depurated. Such practices, while enabling the

fraction of nutrients stored in the wood to be removed (ranging between 10 and 20 kg P/ha year with willow trees, and between 7 and 15 kg P/ha year for poplar trees), at the same time ensure the decisive distancing of the nutrient. Such operations may offer the great advantage of being better accepted by farmers as they enable them to manage the cultivation autonomously while at the same time increase their own income.

Plant depuration systems could also be accompanied by a well-designed hydraulic management of the ditch network. This would allow, in the course of the year, appropriate volumes of water under depuration to be delivered while simultaneously ensuring that the water remains for a suitable time for the nutrient loads to be removed.

Conclusions

Improvements in the organization of agricultural activities in the peri-urban context could help to achieve a better ecological balance in the neighbouring urban systems, thus improving their level of sustainability. The promotion and support of effective "agronomic management" of district-wise ecological issues at a farm scale could help in achieving important results throughout the territory; without the need for too costly actions.

A good example is the case-study illustrated, which highlights the role that agriculture could play in reducing the impact of phosphorus pollution in the Lake Massaciuccoli. The definition and subsequent introduction of agricultural models to contain the charge of nutrients coming from cropped fields could be integrated by designing ways to reduce the concentrations of phosphorus detected in the adduction network leading to the shallow water body.

The chances of such solutions being accepted by the rural communities of the district depend on to what extent farmers are involved. A frank and constructive dialogue will enable possible technical/financial difficulties to be identified and solved while clearly defining, at the same time, the most suitable planning and financial tools needed. A wide expansion of such actions, which currently go against conventional farming practices in the district, may require appropriate financial support in order for such actions to be implemented and managed efficiently.

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Case study

The coastal area of Massa Carrara: an exemplificative peri-urban system[1]

The two systems of the province of Massa-Carrara

The province of Massa-Carrara is located in the north of Tuscany, and is bordered by the Tyrrhenian Sea, Liguria, the Apuane Alps and the Tosco-Emiliano Apennines.

The surface area of the province is 1,156 Km^2 and is divided into two systems. The coastal system has a plain all the Tyrrhenian Sea and is flanked by the Apuane Alps. The valley system of the Magra river, called Lunigiana, is characterized by a plain surrounded by several hills which are flanked in the northern and eastern parts by the Tosco-Emiliano Apennines. The province thus has to manage two completely different systems, from a geographical, morphological and socio-economic point of view.

Lunigiana is predominantly rural around the small towns and the Magra valley where some larger towns are located. In the coastal area, where the main cities are, the development of urban areas during the last century has had a big impact on the socio-economic context and the landscape. The population density is a useful indicator of the diversity of these two areas: 57 inhabitants/km^2 in Lunigiana and 801 inhabitants/km^2 along the coast. For this reason, the coastal area is a case study of particular interest concerning the impact of urban development on the dynamics of agricultural landscapes (Table 1).

Total surface (Km^2)	Total mountain surface (Km^2)	Mountain area/ total area (%)	Total No. of inhabitants (Istat 2008)	Average population density inhab/ Km^2)
181.93	121.12	66	145,823	801.5

Table 1: main characteristics of the coastal area.

The coastal system

The coastal area of Massa-Carrara province is characterised by a 4 km wide plain. Parallel to this plain there is a hilly system, with steep slopes and three main valleys originated by rivers coming from the calcareous structures of the Apuane Alps. The Alps are up to 1800 m above sea level.

[1] Maria Teresa Zattera – Dirigente Settore Ambiente, Provincia di Massa-Carrara and Stefano Bacci – Settore Agricoltura e Foreste, Provincia di Massa-Carrara (Italy)

Therefore in the space of 15 km there is a plain, hills, and mountains, each with different environmental conditions and land uses. The main towns are Carrara, Massa and Montignoso near the hills, and the residential areas of Marina di Carrara, Marina di Massa and Cinquale near the seaside. The hilly and mountainous areas are characterised by small villages located in the valley or in the areas most exposed to the sun (Figure 1).

Figure 1: the systems of the coastal area (base Fly-through Provincia Massa-Carrara).

The coastal plain: landscape identity during the history

The coastal plain was once a crossroads between Northern and Southern Italy, and this had an important impact on the socio-economic development and on the cultural heritage of the area. The agricultural system was based on the integration of different kinds of land uses to better exploit the territory. For example, the steep alpine slopes were used as summer meadows for sheep and goats or for timber production. Each mountainous small village had nearby orchards and gardens, chestnuts woods and grasslands, which were cultivated on bench terraces. The hilly areas were characterised by permanent fruit crops such as vineyards and olive groves, which still remain in the area. The plain was mainly devoted to vegetable and permanent fruit crops, rather than cereals or grasslands. These three farming

systems were highly related and complementary. Between 1860 and 1920, there were important structural changes in the province. Carrara based its economy on marble, while Massa was an agricultural market. Between 1922 and 1929, 700 farms disappeared because of the fragmentation of the land tenure. In the 1930s the first industrial areas were thus established on 800 hectares of the plain between Massa and Carrara, and the erosion of the agricultural lands began. During the 1980s, the urban sprawl was uncontrolled and took over a high proportion of these lands (Figure 2 and 3). Today some residual and fragmented agricultural areas still remain in the coastal areas. The main productions of the coastal plain are horticultural crops, olive groves and greenhouse crops, whereas the hills are characterized by vineyards and olive groves.

Figure 2: recent urbanisation of the coastal area is shown in yellow.

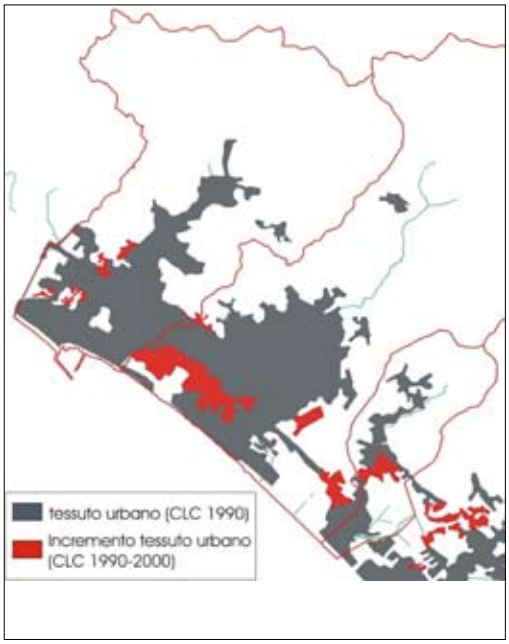

Figure 3: comparison between the urban fabric in Corine Land Cover 1990 (grey) and the sprawl in 2000 (red).

The farming systems of the coastal area

The three morphological systems of the coastal area are characterised by different agricultural land use and farming systems. Furthermore, there are still traces of the historical agricultural heritage and of its landscape patterns. In the plain there is a dominance of horticultural crops and permanent fruit crops. Few farms are full-time, while hobby-farms are common. There is also a residual livestock farming of sheep and cows. In the hills vineyards and olive groves are predominant, whereas in the mountains the historical landscape patterns around the villages still remain.

Table 2 shows the share of the various agricultural surfaces with respect to the total surface and the woods. Less than one third of the province is suitable for agriculture. However, the distribution of the agricultural surface in the three systems is highly heterogeneous, as we will see below.

UAA arable crops	UAA permanent fruit crops	UAA meadows	Total UAA	Non utilised area	Other surfaces
209	1.304	1.670	3.183	1.306	1.003
Total agricultural area (TAA)	Total Surface (TS)	% UAA/ TS	Woods	TAA including woods	% UAA/ TAA
5.492	18.193	30%	4.882	10.374	57%

Table 2: Agricultural and forest (Ha) in the coastal area (Source Istat - V censimento generale agricoltura 2000).

The agricultural landscape of the coastal plain

Main features

The residual agricultural areas of the coastal plain maintain the traditional patterns of small-medium size farms: open fields within a frame of roads and small canals that are orthogonal to the coastal line. The farms are usually for family self-consumption, though there are some professional farms - horticultural and livestock (dairy and sheep).

Identities and values

The landscape matrix is highly diversified because of the diversity of production, and the size of the farms. This generates different land uses, dense hydrological and road networks, and the conservation of a traditional hedge network. There is an important link with local produce since some horticultural crops are in the list of traditional Tuscan produce along with Massese sheep. Furthermore, there is a link between the coast and the mountains in terms of the livestock farms, which are still using the meadows of the Apennines.

Pressures, dynamics and constraints

The coastal plain has been subject to the urban sprawl for several years. This has led to the erosion of the agricultural land and of the traditional

rural landscape. The development of tourism nearby the coast and the presence of industrial areas have reinforced the sprawl around the urban centres and roads. Therefore there are now many urban areas even within the agricultural areas (Figure 4).

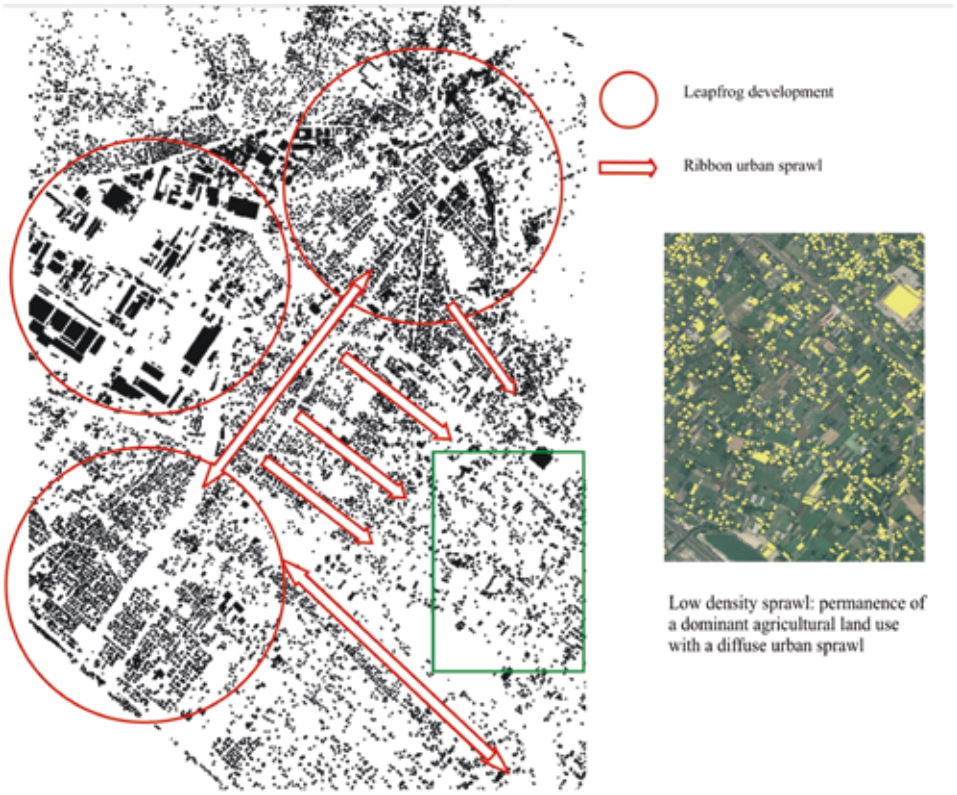

Figure 4: closed agricultural areas and pressures from urban sprawl in the coastal plain.

The agricultural landscape of the hills

Main features

The main land uses of the hills are vineyards and olive groves. Because they are grown on bench terraces that were built on steep slopes, no other crops exist, thus ensuring the conservation of the traditional landscape. The establishment of an appellation of origin "Candia dei Colli Apuani" and the permanence of a local economy of olive oil, has enabled the conservation of professional farmers and of family farms (Figure 5).

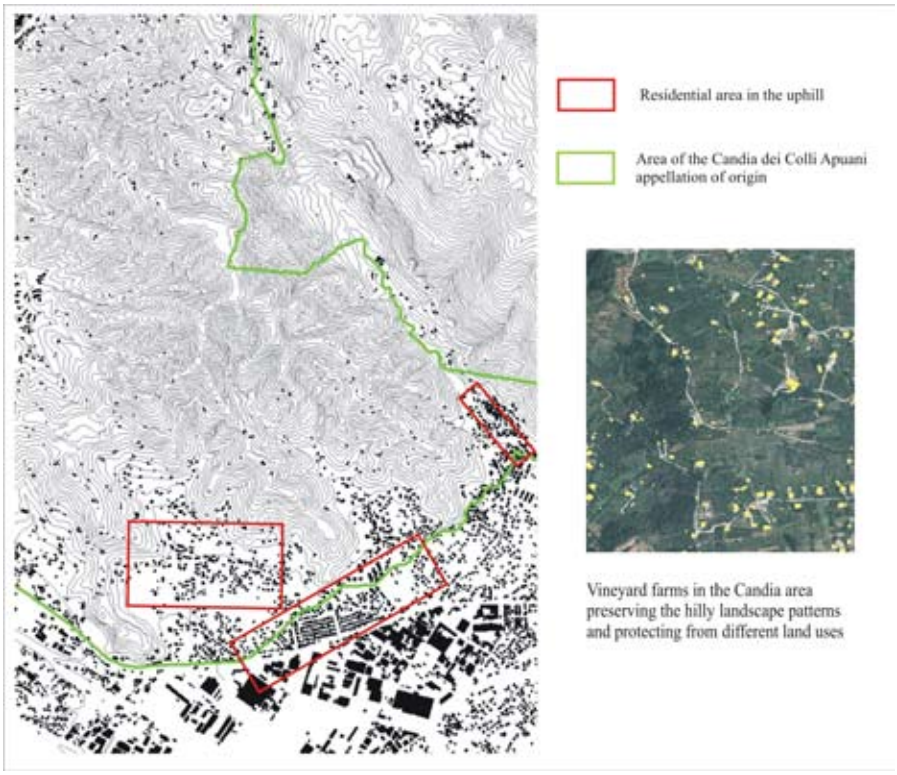

Figure 5: protected vineyards of Candia and urban sprawl.

Identities and values

There is a strong link between the farmers in the hills and the urban environment. The management of vineyards and of olive groves is strongly influenced by the steep slopes, thus requiring active management of agrarian works. The presence of the appellation of origin has helped to preserve traditional agricultural practices (e.g. plant density, kind of varieties, pruning systems) as well as landscape patterns. Concerning the olive groves, even though there is no appellation of origin, increasing attention is being paid to the qualitative side of olives and olive oil both among professional and family farmers.

Pressures, dynamics and constraints

The main pressures on the agricultural land use due to the urban sprawl are being transferred from the plain to the hills, because of the high proximity of these systems. The sprawl inside the agricultural hilly area is often linked to buildings with no planning permission that often contrast with the

traditional housing of the hills. The relatively high costs of production for farming activities are a constraint for small wine farms wishing to respect Italian and European rules. Therefore, such small-scale farms are difficult to sustain. The decrease in the number of farms is a threat also for the conservation of the bench terraces (Figure 6).

Figure 6: the hilly landscape of vineyards.

The agricultural landscape of the mountains

Main features

The areas inland are highly influenced by the soil morphology: deep valleys and steep woody slopes in the lower altitudes, bare rocks and meadows in the highest altitudes. The current landscape is derived from the dominant agro-silvo-pastoral system of the Apuan mountains that was combined with marble quarrying. In this system a large-size farm building was similar to a village and included arable crops, vegetables, the chestnuts groves, copse woods, and meadows. This structural and functional organisation is still present in the current patterns of the mountain landscape.

Identities and values

The organisation of the territory is centred on the villages. A network of paths crosses the mountains, which is characterised by the presence of bench terraces and terraces that are held up by turf for vegetables and chestnuts groves. The identity of mountain landscapes is well preserved through rural and farm buildings, which are in a better condition than in the coastal and hilly systems. The local inhabitants are still attached to their land. The policies of local authorities are thus aimed at preserving the local agro-silvo-pastoral system, e.g. goat breeding in the Apuan Alps.

Pressures, dynamics and constraints

The rural and agricultural exodus of the last century has completely changed the patterns of the mountain landscape. Unmanaged woods such as copse woods or chestnuts groves have periodically provoked soil erosion. Rural buildings not linked by main roads have been abandoned, causing a decrease in some land uses such as high altitude meadows. Furthermore, there is a loss of open areas, which are gradually being taken over by woods because of the decrease in grazing (Figure 7).

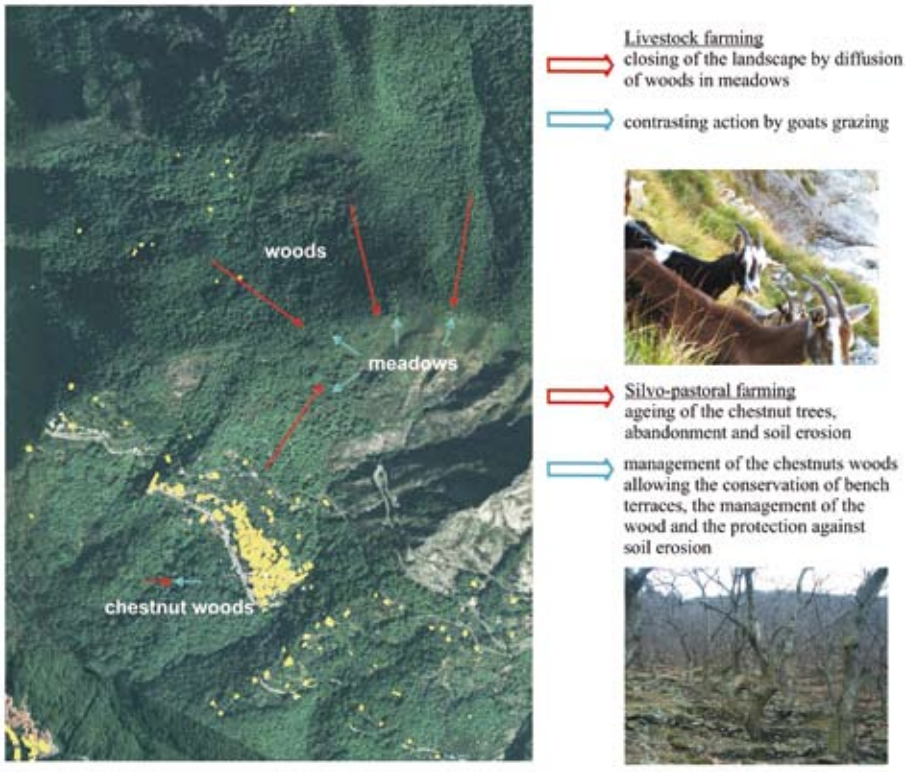

Figure 7: a mountain area (Antona) showing the pressures caused by abandonment.

The actors in the agricultural landscape of the coastal area

Farms

The coastal area is characterized by different land uses and pressures from the urban sprawl and the abandonment of the agro-silvo-pastoral system. The conservation of the agricultural population is thus of primary importance. This can be done by identifying farms, both professional and part-time, as the main stakeholders for local policies supporting agriculture.

However, this low number of farms is really important to maintain the patterns of agricultural land use. Part-time and hobby farming are also common and contribute to the agricultural landscape. Furthermore, community-supported agriculture and direct selling of farm products are also common practices (Table 3).

Full-time agricultural farms	Total registered firms	% farms on the total firms
300	13,232	2.27%

Table 3: number of farms registered in the local chambers of commerce (31/12/2007).

Local authorities

The tools and measures to support local agriculture

Provinces are the main actors in agriculture governance, both through their own tools (e.g. regional agricultural plans) and through European common policies (e.g. local development plans). The main goal of local agricultural policies is to support the diversification of agricultural activities and the promotion of local products so that farmers are not forced to abandon the land. These policies have provided good results in the last ten years. In the coastal area, the development of direct sales, the creation of a producer consortium of Massese sheep, the improvement of chestnut groves, along with the allocation of a room for discussions during the weekly market. Table 4 highlights the various factors involved in these policies.

The main planning tools

The Piano Territoriale di Coordinamento (PTC) is the main tool to outline regional objectives and local actions by defining thresholds for sustainable local development. The regional laws in Tuscany are defined by Italian law No. 1/2005 and prescribe two main tools:

Plans	Goals	Actors involved	Constraints	Values	Relevant results
Rural development Plan[1]	- Modernise farms - Encourage young farmers - Improve woods - Diversify farming activities - Improve the environment	Full-time farmers	- Excessive bureaucracy - Exclusion of non full-time farms	Modernisation of farm structures, hence more competitiveness for the supported farms	Generational turnover, farm modernisation, improvement of the degraded wood soils
Provincial Plan for agricultural extension services[2]	- Quality through diffusion of quality products and traceability, support for niche produce. - Reinforcement of the local network of producers/consumers - Rural and agricultural information diffusion - Facilitate the exchanges between farms and associated producers	All the actors of the rural system (full-time, part-time and hobby farmers), catering, consumers	- Exclusion of non-associated actors - Fluctuation of the local products - Scarce trust among the actors in the network	Strengthening of a local system based on local produce	- Development of new networks (e.g. Massese sheep consortium) - Qualitative increase in production (olive oil) and development of organic farms
Regional project "short supply chain"[3]	- Improve the offer of local and quality products - Promote the local and seasonal consuming of local products. - Promote small scale local production in marginal areas - Promote agreements among actors of the supply chain	Full time farmers having the minimum thresholds for selling their products	- Local products are not available all year round - Difficult answers to consumers different requirements (organic, conventional)	- Consumer confidence in local producers - Better knowledge of the territory by the local population - Increase opportunities for farms	- Creation of a short food supply chain shop in Massa - Creation of two fresh milk dispensers

[1] Piano Locale di Sviluppo Rurale (ex Reg. CE 1698/05)
[2] Piano Provinciale dei Servizi di Sviluppo Agricolo e Rurale (LR. 34/01 e PAR ex L.R. n. 1/2006)
[3] Progetto Regionale "Filiera Corta" (DGR 335/2007)

Table 4: some of the policy tools.

a) *planning tools*: Piano di Indirizzo Territoriale (PIT) at a regional level, il Piano territoriale di Coordinamento (PTC) at a provincial level and Piano Strutturale (PS) at a municipality level.

b) *measures of local government*: these mainly relate to municipalities or specific sectors. These measures manage any changes in local areas and the policies for specific sectors in relation to the above planning tools.

The PTC of Massa-Carrara province

The main objectives of the plan concern the conservation of the local resources and marginal areas in order to plan a harmonious development between human activities and the environment.

The PTC has been organized alongside the PIT which identified several local area systems each with some main objectives and permanent structures.

The *territorial systems* are characterized by several fundamental resources, which are analysed in terms of conservation and potential for renewal. The main resources are: air, water, geomorphology, soil and ground-soil, eco-systems, cultural goods, settlements, and landscapes. The conservation of resources is based on the following points:

- Improvement of the network through promoting typical products and tourism, by respecting the main historical, cultural and environmental values of the territory;
- Support and maintenance of the rural areas where typical products are produced;
- Conservation of the specialized agricultural land uses or support for the local farms;
- Organisation of infrastructures to support tourist circuits along with the traditional ones.

The functional systems consist of several units and nodes (areas, contexts). They represent the detailed strategy for developing local areas by defining specific objectives. There are two functional systems in the PTC: the environmental system and the high value cultural-heritage system. These two systems promote and support agro-silvo-pastoral activities for environmental protection and management of water and soil works. The value of agro-environmental resources is recognized, such as the physical elements (farms, farm holidays, rural tourism, other production activities) and typical and niche products. The main elements that make up the functional systems are:

- the "Colli del Candia e della Lunigiana" wine route;
- the areas including the wine appellations of origin "D.O.C. del Candia", "D.O.C. dei colli di Luni" (Fosdinovo, Podenzana, Aulla) and "D.O.C. Val di Magra";
- all farms (including livestock farms);
- farm holidays ("agriturismo") and other forms of rural tourism;
- the network of the catering;
- traditional crops, particularly chestnuts;
- typical products (Figure 8).

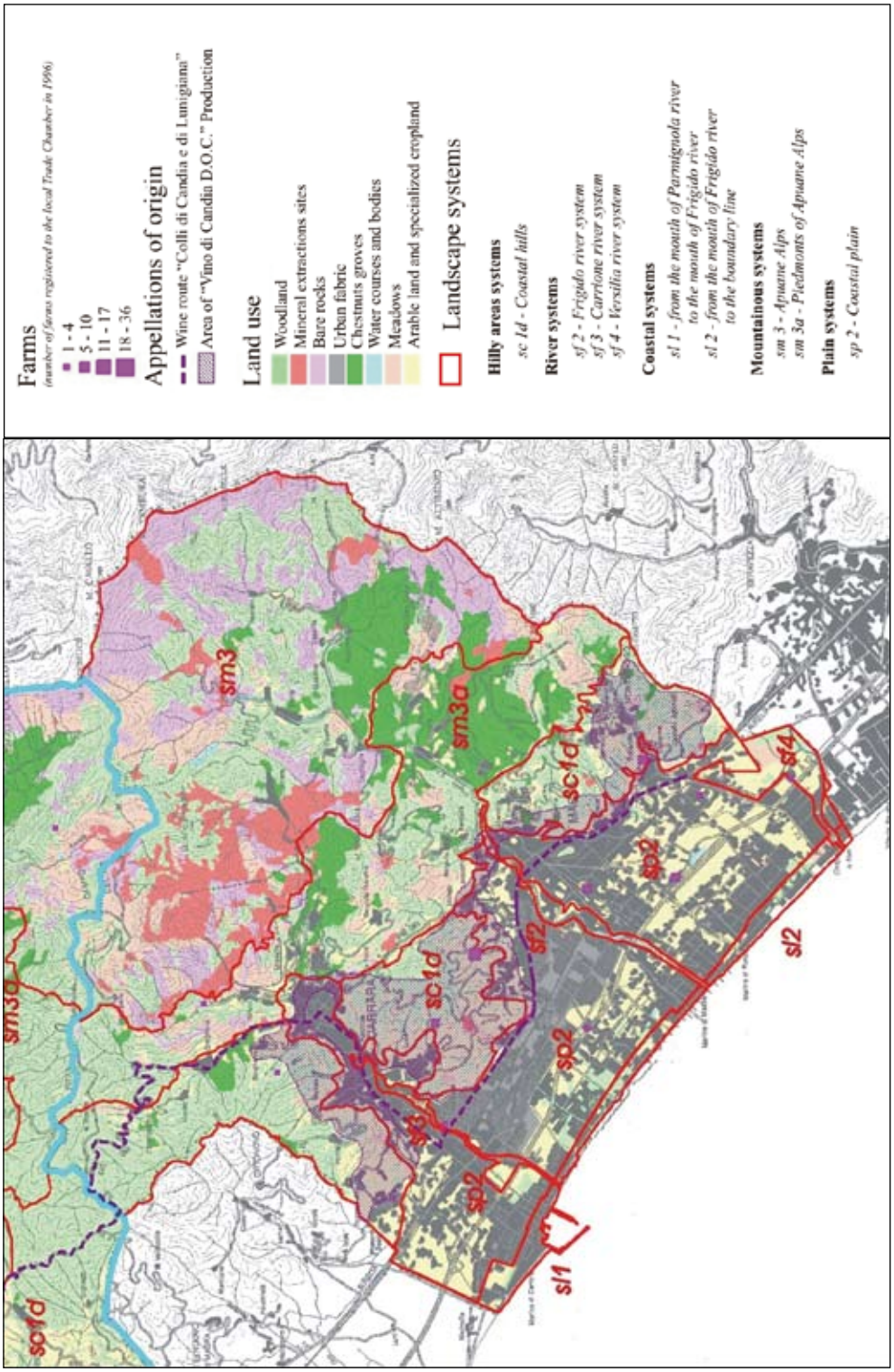

Figure 8: landscape systems identified in the PTC of the province of Massa-Carrara.

Possible evolutions of the Massa-Carrara PTC

The various plans for specific sectors along with the municipality plans result in a kind of segregate planning. This calls for further integration between the main environmental, cultural and infrastructural networks, which are considered as common threads in the excellence of this territory. In this view, the networks can be a useful way to interpret local organizations and how they work together, thus helping any future plans.

In a society made up of networks, the various networks interact with each other, hence the territory can be seen as a network of networks suggesting a possible holistic and integrated interpretation of the territory. This is thus the backbone of the new PTC, which has led to two main directions:

- the construction of a provincial ecological network, which is only at a draft stage in the current PTC;
- the application of the European Landscape Convention, which only plays a minor role in the current PTC (for example an attempt to define uniform landscape areas or an integrated landscape assessment).

For several years, the issue of ecological networks has gained increasing interest in research and policies concerning nature conservation and the management and planning of local areas. A big bottleneck in local planning at a provincial level depends on the efficiency of the networks between different resources and subjects. Production and urban decentralisations, urban sprawl and new kinds of widespread urbanisation have produced *a break-up of the city in the territorial networks*. These decentralisations quickly eroded the agricultural and natural spaces, resulting in an enlargement of the *urban footprint*. This phenomenon was more important in the coastal area and produced for example loss of habitats, the disappearance of rural landscapes, water cycle modifications, waste of energy, and a degeneration of the territory. With regard to these issues, ecological networks are an effective planning tool to ensure the connectivity, continuity and cohesion of the local area systems at different scales. The network acts against blocks and fragmentations, and helps to minimize the increasing environmental degradation.

Going beyond an *insular* concept of the landscape and changing the perspective, policy-makers and planners are interested not only in outstanding landscapes but also in ordinary or degraded landscapes.

The European Landscape Convention pointed out the complex meaning of a landscape: not only in terms of aesthetics and ecology but also anthropology and culture, history and semiotics. This meaning was defined taking into account both the dynamic interactions between natural and human factors and as an essential identity component of how the local people live. In

this perspective, protecting the landscape is linked with the projects of local authorities. Such projects are at three different levels:

- protection from the main degradation factors;
- management and control of the main processes that are changing the landscape;
- planning of the expected changes or of the changes needed to conserve the perceived values of the landscape;
- re-establishment of degraded landscapes or the creation of new landscape configurations where past processes have altered the identity of the landscape.

Planning can be influenced by the diversification of the landscape and of the ecological, social and cultural heritages. In a sustainable planning perspective of local communities, there is a close relation between the description of the networks and landscapes, hence between policies of ecological networks management and landscape governance. Landscape diversity is an interesting synthetic point of view: it derives from the joint action of natural and human processes acting at different spatio-temporal levels. Furthermore, landscape diversity is linked to the diversification of cultural and socio-economic structures along with the territorial organisation by moulding landscapes, modifying their meaning and their functions for current society.

Conclusions[1]

The aim of this collection of papers was to highlight the challenges of managing peri-urban agriculture rather than comparing the status of French and Italian peri-urban agriculture. Nevertheless the contributions have pointed out two different institutional contexts.

In the last ten years, the French context has been characterised by the creation of a framework, which is based on legal institutional procedures, for the agricultural management of peri-urban areas and for the governance of urbanization in these areas (e.g. by new forms of cooperation between rural and urban municipalities, such as "communautés de communes" or "communautés d'agglomération").

Examples of these procedures are provided by the experiences of Billom (Claire Planchat-Héry) and of Volvic Sources et Volcans (Salma Loudiyi, Sylvie Lardon, Laurent Lelli).

The Italian status has not developed an institutional framework shared by regional and national levels. It is more experience-oriented, highlighting local endogenous processes, which are only in part influenced by procedures defined by law. The two papers concerning the agrarian peri-urban parks of Prato by Daniela Poli and Asti by Silvia Novelli and Bruno Giau are examples of this process for Italy.

However both France and Italy have some common issues. Although not explicit, the papers highlighted a shared consideration concerning the agricultural management of peri-urban areas as a complex process by progressive adaptations in defining development and governance strategies. In order to develop this process, both short term and mid-long term measures are needed.

For the short term, it is essential to support the residual and threatened agriculture through sectorial and targeted policies to safeguard it aiming to the self-sufficiency and the securing of investments. In some areas the main threat is the dispersion of agriculture through fragmentation and structural weakening. This is due to insufficient space and continuity between cultivated lands.

The availability of sufficient resources and dedicated spaces is essential to renew agricultural organisation and management in favour of a strong agriculture of proximity. As highlighted by Xavier Guiomar, land policies and the support of policies regarding agricultural production need to be

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[1] Sylvie Lardon - INRA & AgroParisTech-ENGREF, UMR Métafort Clermont Ferrand (France); Mariassunta Galli, Elisa Marraccini, Enrico Bonari - Scuola Superiore Sant'Anna (Italy).

accompanied, in a common project, by other policies regarding production and agricultural qualities; environmental protection; marketing; agricultural integration in the local cultural heritage and governance. These policies have to be carried out in synergy to ensure that they mutually enforce each other rather than weaken each other. Gianluca Brunori and Stefano Orsini underlined the role of urban food policies (for healthy and fresh food) as being fundamental to enforce peri-urban agriculture.

However in the short term, peri-urban agriculture has to overcome the problems linked to critical environmental situations: damage to agro-ecological processes (Francesco Fava, Antonio Monteiro, Stefano Bocchi), to natural resources (Nicola Silvestri and Enrico Bonari), and to ecological connectivity (Massimo Sargolini).

In the mid to long-term, the challenges are to increase new peri-urban identities. In the past, two kinds of identities emerged: rural and urban. Today a third identity has emerged based on peri-urban societies and territories. These need to be considered not only as a mixture of urban and rural characteristics and as the interface between rural and urban, but as new socio-spatial systems with their own identity (functional and structural) based on multifunctional and multiactorial properties (as highlighted by Brigitte Nougarèdes and Christophe Soulard or by Salma Loudiyi, Sylvie Lardon, Laurent Lelli). Thus mid to long-term measures need to be considered in order to reinforce these challenges.

This volume contains a series of experiences in support of local planning processes. Above all, it puts forward agricultural management in peri-urban areas as the starting point for developing new spatial, societal, productive identities. Agriculture in peri-urban areas needs to have its own spatial planning needs, new typologies of actors' networks, and new governance models.

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