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Community Supported Agriculture in the Urban Fringe: Empirical Evidence for Project Feasibility in the Metropolitan Area of Naples (Italy)

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ABSTRACT

Urbanisation of city-side areas effects on farm land use and organisation are analysed in this study with the objective of seeking the most effective way to implement a Community Supported Agriculture (CSA) scheme. Specifically, we used a theoretical framework to describe and assess the relationships between urbanization and farm-styles in the city belt. Our analysis is based on a case study in the protected area of the Campi Flegrei Regional Park situated in the north-western part of the Neapolitan metropolitan area, which is a peri-urban rural area with severe environmental management problems. Our results from the empirical analysis allowed us to distinguish the farms of the area into three behavioural-social groups on the basis of specific features, in order to identify the best suited type of farm for the strategic implementation of the CSA. A market scenario was predicted for each of them without any intervention

Keywords: Community Supported Agriculture, peri-urban agriculture, Regional Park of Campi Flegrei, Cluster Analysis

1 Introduction

In this paper, the effects of urbanisation on farm land use and organisation are analysed. In particular, a theoretical framework originally presented by Heimlich and Anderson (2001) was used and adapted to describe and assess the relationships between urbanisation and farm-styles in the city belt. Our analysis concerned a case study in the protected area of the Campi Flegrei Regional Park situated in the north-western part of the Neapolitan metropolitan area, a peri-urban rural area with severe environmental management problems. The adaptive ability of farms to react to changes in this socio-economic context was analysed in order to find a possible plan to support farming in the urban fringe, which is the Community Supported Agriculture (CSA), and implement it in an effective way. To describe the behaviour of farmers in relation to the degree of adaptation to, or rejection of urbanisation processes we adopted the conceptual model of the farm-style approach developed mainly for rural areas (Heimlich and Brooks, 1989; Van der Ploeg et al., 2002; Vandermeulen et al., 2006). Referring to this approach, we distinguished two types of driving factors which could specifically influence peri-urban farm strategies: the effects of urbanisation, which could influence agricultural market conditions both upstream and downstream; secondly, the existence of specific rules for using natural resources (i.e. land and water) and for managing environmental issues (Heimlich and Brooks, 1989) in urban and suburban areas. These factors cause the creation of a specific system of pressures and opportunities acting on urban farms which are completely different from those present in rural regions (Heimlich and Barnard, 1997). The reaction to these changes is a farm strategy which allows farms to be distinguished into three behavioural groups, but can a scenario

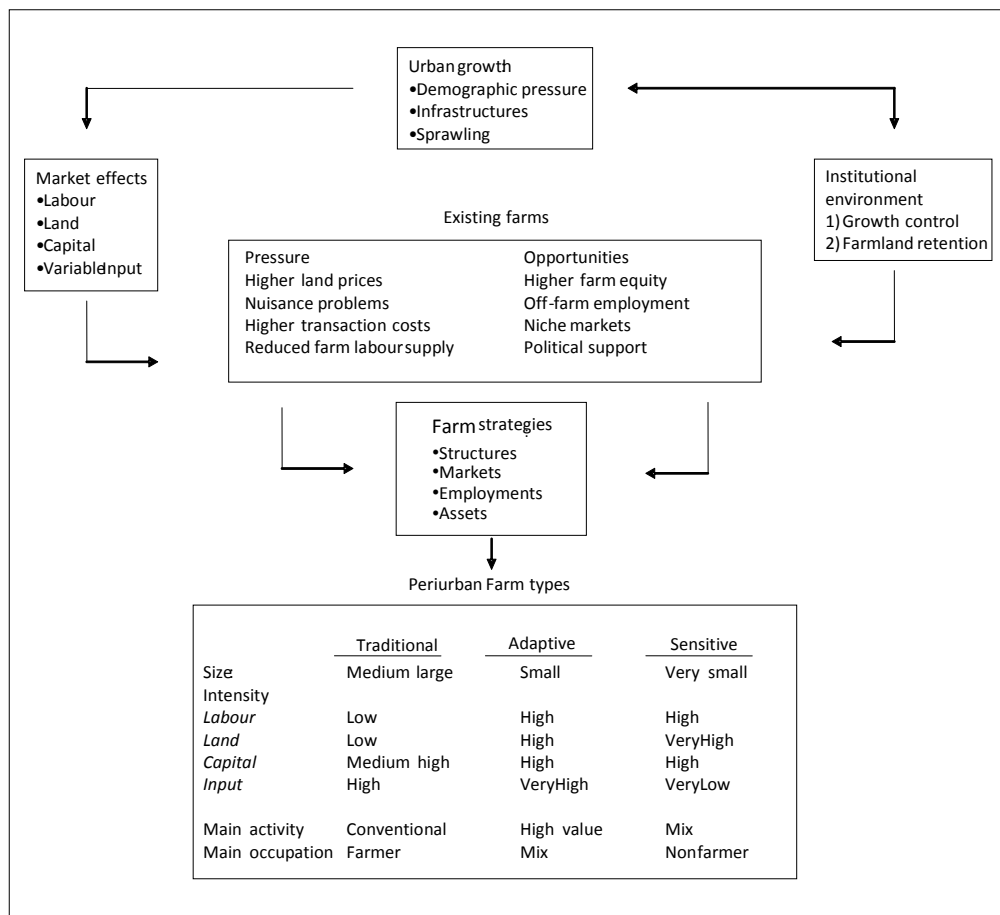
be predicted for each of them? Furthermore, considering their important social and environmental roles, can the CSA be an optimal intervention strategy to support them? What are the farms characteristics that make the CSA addressable?

The paper is organised as follows: sections 2 reviews the literature on peri-urban agriculture and the theoretical framework; a proposal for an alternative development approach in peri-urban areas, the CSA, is presented in section 3; section 4 describes the study area; in section 5, results from an empirical analysis are shown. Finally, some concluding considerations are presented.

2 Background

2.1 Agricultural adaptation to urban areas: the conceptual model

Identification of territorial policies aiming to develop peri-urban areas requires great attention to complex economic, social and institutional relationships (Zhang, 2001; Mann, 2006). Rural development intervention policies have progressively adapted to new scenarios in the primary sector, focusing on the whole set of stakeholders involved in economic growth processes (Leon, 2005). In the same way, predicting or strengthening rural development policies for peri-urban areas implies focusing on their specific features. Hence it is necessary to identify peri-urban farming characteristics, in what way they might contribute to socio-economic dynamics and how they might respond to the various stimuli of public intervention policies. For this purpose, it will help to refer to a conceptual model able to represent the adaptation of agriculture to urban growth (figure 1).



Source: our adaptation on Heimlich and Anderson (2001)

Figure 1. Conceptual model of agricultural adaptation to urbanisation

Based on the model in figure 1 we may distinguish two types of factors leading farmers' choices: market conditions both upstream and downstream of the primary sector; specific regulations for using natural resources and land management (Van der Ploeg et al., 2002; Vandermeulen et al., 2006). These factors originate a particular system of opportunities and pressures on the single farm which differ enormously from conditions of a rural context in the strict sense. Thus, three different basic types of farm strategy are to be expected. The first concerns farms which react to changes with a conservative strategy, preserving

the same economic and organisational structure as before intensification of urbanisation. They can be called traditional in the sense that they show a system of resource use and structural features close to farms located in rural areas. They show a production organisation based on high intensive use of capital and variable inputs, but low intensive use of land and labour (extensive). Following this strategy, income comes mainly, or exclusively, from farming; indeed, these farms are generally large. The traditional agriculture-based strategy implies greater orientation to the agribusiness environment. Traditional urban farmers are not opposed to change but they use the new opportunities afforded by the changed environment to enhance agro-food activities through supply chain management (food industry relations, short supply chain, networks with big food retailers, etc.).

The second farm type refers to those most sensitive to changes due to urbanisation. Such farms show a low land endowment (in terms of production area) and experience land-use constraints (reduction in tenant farming possibilities, increase in the opportunity to sell estate assets, inheritance problems, farm fragmentation, expropriation, etc.). These farms are inclined to adapt to new conditions through an increase in intensity of factor use, through a shift to high value-added production and off-farm income (part-time) or diversification. They are strongly specialised, both productively and commercially dynamic, and they replace the low endowment of land with a constant process of innovation. Finally, there is a third type of farm which could be considered the most reactive and adaptive to new urban conditions. These farms are mainly geared to providing services to the urban society, especially in terms of recreational activities, environmental preservation and landscape conservation. These activities tend to predominate, but only some of them can be paid back through market mechanisms.

2.2 Community farming as a policy instrument in the urban fringe

From a policy perspective, the activity that should especially be encouraged in a peri-urban area by local institutions is the creation of alternative form of interaction between farmers and consumers such as short supply chains (Vandermeulen et al., 2006; Brunori et al., 2010; Pascucci, 2010). An alternative food supply chain mainly consists in establishing a direct relationship between producers and consumers, which allows market prices of products to approximate production prices, trust formation and knowledge co-creation between the different actors. In Italy different forms of alternative food supply chains have aroused the interest of both farmers and consumers in recent times (Brunori et al., 2010; Pascucci, 2010). Examples are the so-called Solidarity-based Purchase Groups (GAS), Farmers Markets (FM) and to a less extend Community Supported Agriculture (CSA). Of these various types of short chain initiatives, the type of short chain expected to be more effective in a peri-urban area is provided by CSA. Unfortunately it is also the most difficult to set up because requires high level of trust and commitment between farmers and consumers (Pascucci, 2010).. The CSA partnership concept originated in the 1960s, when a group of Japanese women, concerned with the increase of imported food and the loss of farmers and farmland, asked local farmers to grow vegetables and fruit directly for their families. Starting from that, a number of families committed themselves in order to supporting their region agriculture. A CSA is characterised by the potentiality to develop the local food supply and strengthen the local economy whilst maintaining the sense of community; it highlights the know-how and competences of farmers who work in a mosaic of small-scale farms. Moreover, this marketing tool prospers where many small farms can satisfy consumer needs with a wide range of farm products, for a sizable urban population living in proximity of farms. Instead, the CSA is less appropriate to areas with large-scale specialised farms in areas with a low population density (Adam, 2002). CSA, with its numerous variants, is not yet widespread in Europe (Cembalo et al., 2002; EU/AIAB Project, 2001). As defined by Gradwell et al. (1999), it is a partnership between farmers and community members working together to create a local food system. CSA farmers may produce vegetables, fruits, meats, dairy products, fibres, etc., directly for local community members. CSA differs from direct marketing because its members commit to a full-season price in the spring, sharing the risks of production. With this up-front support, farmers can concentrate on growing quality food and caring for the land. In return, members know where their food comes from and how it is grown; they share a connection to the land and farmers who produce for them, establishing a direct economic and social link between farmers and community members (Wells and Gradwell, 2001). Encouraging the creation of a CSA in a peri-urban area is important because:

- it allows an increase in farmers' added value, usually lost downstream in the market chain;
- it ensures production risks are shared with community members;
- it stimulates farmers' cooperation;
- it satisfies product traceability requirements;
- it reduces the food carbon footprint;
- it supports rural development via the market;
- It creates a sense of social responsibility towards farmland management.

According to an OECD report on multifunctional agriculture, CSAs might also be a tool for internalising agricultural positive externalities via the market (OECD, 2001; Cembalo et al., 2002).

These are the reasons why we chose to evaluate the possibility of applying a CSA initiative in the study area, rather than other forms of short supply chain, like FM or GAS. The results of our research are designed to be transferred to local authorities and project stakeholders, lending a contribution to solving farming problems in this area.

3 The case study of Campi Flegrei Regional Park

3.1 The characteristics of the case study area

The case study area is the Campi Flegrei Regional Park situated in the administrative province of Naples, in Southern Italy. It is a protected area of the metropolitan region of Naples, regulated by a specific set of rules for environmental preservation and land use (National Law no. 394 of 12/6/1991). The areas covered by the Campi Flegrei Regional Park fall within the municipalities of Bacoli, Monte Di Procida, Naples and Pozzuoli, and are subdivided into various non-contiguous zones. The Park has been instituted to preserve the naturalistic, historical and archaeological heritage of the area, and to support the sustainable social-economic development throughout the promotion of tourism. The territory of the Regional Park of "Campi Flegrei" is divided, according to the Regional Law n.33 (September 1st, 1993), into the following zones:

Zone "A" - Area of Integral Preservation;

Zone "B" - Area of General Preservation;

Zone "C" - Area of requalification of urban centers, protection and social-economic development.

The classification above implies that each area is subject to a regime of different constraints and opportunities. In the zone "A" the natural environment must be integrally conserved. In the zone "B", constructions that may impact on the territory morphology is forbidden. It is possible to carry out sylvan pastoral activities, fishing and natural products harvesting, in agreement with legal criteria. Within the zone "C", the execution of activities compatible with the territory and aimed to improve social-cultural life is allowed. The agricultural areas are classified as zone "C".

In the following tables, data related to the land characteristics of the Park and the zoning are reported (Reg. Law n.33, September 1st 1993).

Table 1.
Land characteristics of the Regional Park of "Campi Flegrei"

Municipality	Degree of highland	Altimetric zone	Land surface (Ha)	Land in the Park (%/tot)
Bacoli	No highland	Littoral hill	1.329	4,9%
Monte Di Procida	No highland	Littoral hill	365	3,9%
Napoli	No highland	Littoral hill	1727	0,48%
Pozzuoli	No highland	Littoral hill	4321	2,6%

Source: Regione Campania 2003

Table 2.
Park Zoning

Municipality	Park Sup. (Ha)	Sup. zone A (Ha)	Sup. zone B (Ha)	Sup. zone C (Ha)
Bacoli	655,22	2,85	420,63	231,74
Monte Di Procida	142,68	-	84,36	58,32
Napoli	572,58	28,05	46,35	498,18
Pozzuoli	1134,9	285,25	849,65	-

Source: Regione Campania 2003

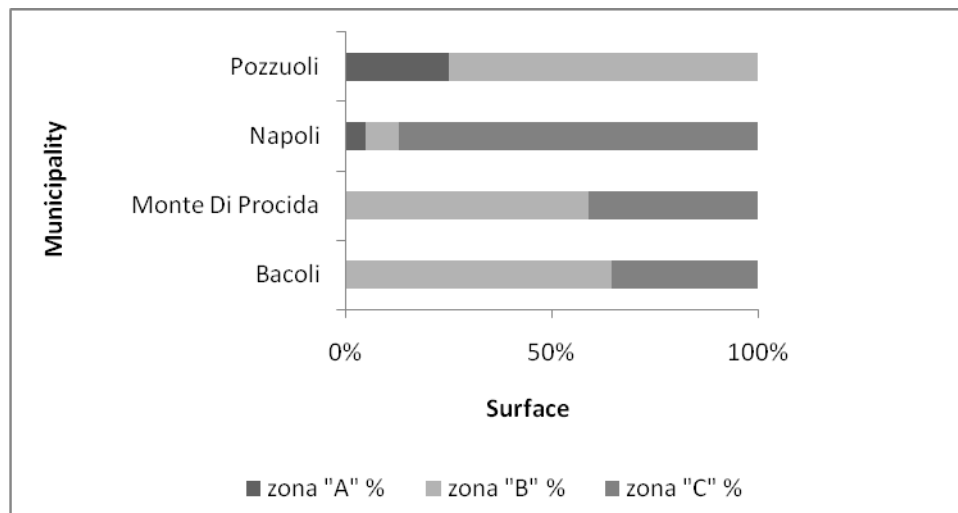


Figure 2. Repartition of the protected surface in the zones "A", "B" e "C", percentage on the total
Source: Regione Campania 2003

The total of the cultivated land within the Park is about one third of the entire surface (31%). Almost 65% of this area is cultivated with permanent crops (i.e. vine yards, olive trees, etc.) while the remaining part is due to arable cropping.

The area of the regional park can be classified as urban according to rural indicators elaborated by the OECD. Despite these two classifications, the type of agriculture practised within the park is not just a marginal activity, because it still exhibits signs of vitality, albeit showing a progressive loss of competitiveness on natural resource use, increasing dependence on other economic activities and on urban social networks. The Utilised Agricultural Area (UAA) is about 21% of the whole area; the regular number of employees in the primary sector is about 13% of the total workforce, according to the latest national census on farming (ISTAT, 2001). Agriculture in the Campi Flegrei can be defined as peri-urban because it is absorbed by urban growth and development (Socco, 1988), but able to survive where typical features of both urbanity (e.g. high population density) and rurality (e.g. high landscape value) coexist (Boscacci and Camagni, 1994).

Focusing on the Campi Flegrei Regional Park, agriculture here is the main feature of the interaction between landscape and rural heritage, and both farmland and natural areas are worth conserving. Indeed, in the park's territory, a considerable part of the landscape value may be attributed to farming practices, first, because farms operating in the park are small or very small, and mainly grow mixed crops (about 60% of the UAA in the park), contributing to the preservation of biodiversity and the creation of a rural landscape. High biodiversity in production systems represents one of the main factors of environmental quality and is considered an essential feature for successful environment-friendly agriculture (Pimentel et al., 1997). Furthermore, other functions of this type of agriculture are area protection and prevention from hydro-geological damage, made effective through typical methods of hillside management. These methods, especially if we consider the "terrace systems", are part of the heritage and are still in use. Campi Flegrei soils, due to their specific volcanic features (Di Gennaro and Terribile, 1999), besides their renowned fertility, are also able to reduce carbon dioxide flows to the atmosphere, thanks to their organic matter retention capacity. Hence they assume an important role for the environment. Through farm practice, these soils, among the most fertile in the world, can be preserved from urbanization but, above all, illegal housing and illegal waste micro-dumps can be prevented.

The area is also known for its typical products, namely the wines Falanghina dei Campi Flegrei and Piedirosso, which have both received the Italian CDO quality certification, as well as Procida lemons. In a peri-urban area like that of Campi Flegrei, the relevance of agriculture, among other environmental functions, concerns also the limitation of polluter emission effects coming from the city smog (mitigation function), and the social-cultural functions of cohesion improvement and transmission of values to new generations. Such functions are strictly related to the production methods employed in this area, which is why it is important to recognize them and somehow reward them, in order to slow down or even reverse the farm abandonment process in the park.

Urban expansion, which is a common phenomenon for suburban areas, has been particularly chaotic in the outskirt of Naples. Hence, also Phlegrean Fields, since the early XX century, underwent a wild process of urbanisation, despite the huge attractiveness to protect. Furthermore, after bradyseism phenomena

occurred in the seafront, urban expansion moved toward internal and more rural areas, and it was completely sudden and unregulated. In order to contribute to the preservation of natural beauties, the role of agriculture is fundamental, especially to reduce the deterioration of soils in state of abandon. Farmland abandonment and neglect are considered harsh problems, having as a consequence the increase of fire accidents and illegal micro-dumps creation.

From a policy perspective, the support to agricultural activities needs to be tackled with an integrated approach, through interventions and action aimed at reducing consumer-producer distances. This strategy may be considered essential for sound development of the primary sector in the park, partly because it also brings about a direct increase in incomes through better market orientation.

4 Data and methodology

4.1 Field survey

Having described the main features of the study area, which may be considered somewhat singular among Italian peri-urban areas because of its severe problem of environmental management, we now move on to analyse the effects of urbanisation on farm organisation and the production process. Relationships between urbanisation and changes in farm style in the city belt are described and evaluated by using a theoretical framework presented by Heimlich and Anderson (2001). The analysis focuses on the area covered by the Campi Flegrei Regional Park, examining the characteristics of a farm sample operating in the park. These farms are classified by five key elements: structural endowment, environment awareness, capability of generating multifunctional services, community relationships and market orientation. It was thus possible to show heterogeneity of farm styles which closely corresponds to the theoretical approach adopted.

This survey aims to underline the structural and socio-economic features of the farms operating in the Campi Flegrei Regional Park, showing changes in organisation and strategy following the pressures and opportunities created by urbanisation. A questionnaire was drawn up and administered to the farmers by phone. It was split into four parts: the first permitted information about the farm's production structure to be collected, including questions regarding acreage and related property title, but also questions about the nature of production, labour and chemical treatment, and on farmers' socio-demographic characteristics. The second part concerns multi-functionality and the tendency to environmentally friendly production, by which it was possible to gauge how many farms certify their production; questions in this section also include self-assessment of the environmental influence of farming. The third part highlighted the importance of area context in the opinion of farmers, raising elements such as their sense of belonging, their confidence in institutions and the willingness to undertake a new development proposal. Indeed, farmers were asked whether or not they would join an innovative marketing project. The proposed project is the so-called Community Supported Agriculture (CSA). The last part of the questionnaire yielded information on farm market orientation, but also the price level for each product.

4.2 Classification of farm styles in the Campi Flegrei Regional Park

There are 1900 farms operating in the Campi Flegrei (ISTAT, 2001). The questionnaire was administered to 271 farms (14% of the farm population) operating in the area and randomly drawn from the whole population. Focusing on the Campi Flegrei Regional Park, the first question had a selective function, since the questionnaire was continued only when the interviewed knew for sure whether his/her farm lay within the park boundaries. Moreover, given that there were farmers who refused to be interviewed, the final sample corresponds to 2.6% (50) of all the farms operating in the whole Campi Flegrei area.

On examining the sample characteristics, it may be observed that farmers' age is medium-high which corresponds, symmetrically, to a low education level, since almost half of the sample were only educated as far as primary school. On the structural side, it is noticeable that the area of rented land is considerable compared to small sizes of farms. The main crops are grapes and other kinds of fruit, including citrus, and vegetables. The peculiarity of local vineyards and citrus plantations is the land management method used for cultivation, which is made of "edged terraces". As the presence of edged terraces makes the complete mechanisation of production systems impossible, most farm operations are done by hand. This is still feasible nowadays, given the modest sizes of land to manage. The area's farms are mainly family farms (ISTAT, 2001), and almost all of the sample are essentially family managed. Of the various market channels for the sale of products, the direct channel to private customers accounts for a high percentage. The sample characteristics described above, which reflect those of the population, are summarised in the tables 3 and 4.

Table 3.
Main production & structural features

		% of the sample	- Farm size	Hectares
- Farmland property title	Total owners	58	average	3.16
	Total tenants	22	mode	1
	Partial tenants	20	median	2
- Crops	Vines	60	minimum	0.20
	Fruit trees	44	maximum	25
	Vegetables	42		
	Citrus trees	36		
	Olive trees	4		
- Type of labour	Family labour	100		
	· with regular wage earners	10		
	· with occasional wage earners	16		
	· with both reg. and occas. wage earners	6		

Source: our elaboration

Table 4
Social & demographic features and market orientation

		Market orientation		
		% of the sample		% of the sample
- Age classes	<35 years	12	Middlemen	22
	35-55 years	46	Wholesalers	16
	>55 years	42	Private customers	40
- Education level	Primary school	48	Firms	6
	High-school diploma	40	Open market	20
	University degree	12	More than one channel	4

Source: our elaboration

Using the data collected via questionnaire, we used a Cluster Analysis to group the sample of firms into three categories, reflecting the theoretical framework introduced above. Cluster Analysis is a statistical method of multidimensional analysis which allows a complex phenomenon to be described by constructing categories or types of elements from a plurality of primary measures (Bolasco, 2004), in this study, the diversity measure used, required to classify cases, is the Euclidean one. Instead, of distance agglomeration criteria, the one used here is the agglomeration criterion according to the variance, known as Ward's method.

We should now describe the nature of variables involved in the analysis and how they were codified to interpret the results. The 24 variables selected from the questionnaire were distinguished into factorial and illustrative. Factorial variables, whose description is summarised in table 3, can be conceptually grouped into five key elements or indicators: 1. structural endowment; 2. capability of generating multifunctional services; 3. community relationship; 4. environmental sensitivity; 5. market orientation. Other illustrative variables provide socio-demographic information.

Table 5
List of factorial variables

Key elements	Description
Structural endowment	Owned hectares Rented hectares Presence/absence of regular wage earners Presence/absence of occasional wage earners
Capability of generating multifunctional services	Degree of mixed crops Degree of alertness in seeing opportunities with park's institution Ranking for farmers' self-assessment of environmental impact
Community relationship	Ranking for farmers' sense of belonging to the community Willingness to undertake a new development proposal involving the community (CSA) Frequency of direct sale
Environmental sensitivity	Kind of treatment for crop protection Environmental certification for farming processes
Market orientation	Middlemen Wholesalers Private customers Processing firms Open market

Source: our elaboration

5 Results

5.1 Description of results

Parsing the classification tree, that is the graphical summary of the cluster solution, to determine the number of clusters, is a subjective process (Bolasco, 2004). Selected hypothesis of efficient cut of the dendrogram, corresponding to a sudden jump between distance coefficients, identifies three clusters at the next-to-last stage of the analysis. The separation of farms into three clusters highlights substantial farm differences and, at the same time, provides a stable and synthetic representation. In table 6, the main features of the three groups are illustrated. For qualitative, binary variables and classes of modalities, the synthetic index that was used for interpretation of the groups is the modal value.

Table 6
Characteristics of the clusters

Variables	Traditional	Adaptive	Vulnerable
Age class (mode)	35/55 years	35/55 years	> 55 years
Education level (mode)	diploma	diploma	primary school
Owned hectares (average)	20.5	1.83	1.15
Rented hectares (average)	0	0.8	1.12
Presence of regular wage earners (mode)	yes	no	no
Presence of occasional wage earners (mode)	yes	no	no
Degree of mixed crop farming (mode)	low	low	high
Degree of alertness to opportunities with the park's institution (mode)	medium/high	low	low
Ranking for farmers' self-assessment of environmental impact (mode)	high	high	high
Ranking for farmers' sense of belonging to the community (mode)	high	high	high
Willingness to undertake a CSA proposal (% of the group)	0	70	57
Frequency of direct sale (mode)	never	often	always
Kind of treatment for crop protection (mode)	env-friendly	organic	env-friendly
Environmental certification for cultivation process (mode)	yes	yes	no
Middlemen (mode)	no	yes	no
Wholesalers (mode)	yes	no	no
Private customers (mode)	no	no	yes
Processing firms (mode)	no	no	no
Open market (mode)	no	no	no

Source: our elaboration

Representative percentages of each group compared to the total sample are: vulnerable farms 56% (28), adaptive farms 40% (20) and traditional farms 4% (2). According to our theoretical framework, and looking at five key indicators used for screening the clusters, the farm types generated by the analysis are:

Cluster 1 - Traditional farms

Farms belonging to this cluster had reacted to the changes due to urbanisation through a conservative strategy, preserving their economic and organisational structure. They are called traditional here because they show a system of resource use and structural features close to those of the farm in rural areas, but this is also the least numerous cluster. First, they are medium-large (average 20.5 hectares), especially when compared to the average area per farm in the Campi Flegrei. The chief crop is the grapevine, mainly marketed through wholesalers. Cultivation methods are mostly respectful of the environment, with some environmental certification systems, and these farms are the only ones in the sample with regular wage earners. They also strongly contribute to environmental protection and land management, since their vineyards are mainly located upon the outer hillside of the Astroni crater, and close to Lake Averno, which are both very sensitive ecosystems. Leading farmers feel a strong sense of belonging to the Phlegrean area and a medium-high degree, compared with the other groups, of alertness to opportunities in the newly-created park. However, these farmers are not interested in joining the market development proposal since they already have well-functioning market channels, and the farm characteristics are not really suited to the proposed project.

Cluster 2 - Adaptive farms

This farm type could be considered as the most reactive and adaptive to new urban conditions. Farms in this cluster are mainly geared to providing services for the urban society. Average farm size for members of this cluster is less than 3 hectares, almost all cultivated with vines and other fruit trees, contributing to

land management throughout hill-side cultivation systems, which is why labour intensity can be considered high. Production is the most environmentally-friendly of the sample, with many farms classified as organic or, at least, as having low-environmental impact cultivation methods; almost half the farms in this cluster have an environmental certification. The farm manager's age lies mostly between 35-55 years, and the most frequent education level is the high school diploma. Like Cluster 1, they feel a deep sense of belonging to the community, consider agriculture very important for area conservation, but are not really aware of opportunities arising from the park's institution. Their main market-channel consists of middlemen, or "brokers", but they are the keenest cluster to undertake the development proposal.

Cluster 3 – Vulnerable farms

The third farm type is the most sensitive to change due to urbanisation, and also the most numerous group. Farms in this cluster show a very low average endowment of farmland (about 2 hectares) and are severely constrained in agricultural land use. Since this is the group whose farms have the most rented land, and some have no land of their own at all, they have experienced typical problems of urbanisation, such as expropriation; farm fragmentation; and difficulties in renewing rent-contracts, due to competition for land use with different, possibly more profitable uses. These are the endangered farms, with farm managers who, for the most part, are more than 55 years old and have only gained primary school education. The main crops are vegetables, often in mixed production systems also with fruit trees; treatments for crop protection are mostly low-impact, at least for a cost-reduction aims; most production operations are manually executed, hence very labour-intensive. Market channels are essentially represented by private customers; indeed, this cluster has the highest frequency of direct sale in the sample. As regards the prospect of joining a development project, about half the farmers in this group rejected the proposal, mainly because these farms survive just thanks to the labour of their elderly farm managers; thus they know that this type of agriculture will end with them. It is significant that, only considering vulnerable farms in the sample, if these disappear, about 64 hectares of UAA will be lost.

Our theoretical framework also distinguished three kinds of farm-style and organisation, but, in this case, some modifications must be made. Unlike other urban areas even in the same region, here it is difficult to find farms with high-income crops, such as flowers or ornamental plants, grown in greenhouses, in the middle of the urban fabric. Thus, in this area there is no high intensity of input use, nor high capital investments and intensive land use, but there is substantial small-scale farming, alongside a few medium-large traditional farms, divided into those which have reacted to urbanisation with great vitality and others which are rapidly disappearing. Peri-urban farm types in the Phlegrean city belt can be represented as follows:

Table 7
Peri-urban farm-types in the Campi Flegrei Regional Park

	Traditional	Adaptive	Vulnerable
Size	Medium-large	Small	Very small
Labour	Medium-low intensity	High intensity	High intensity
Land	Medium-low intensity	Medium-low intensity	Medium-low intensity
Capital	Medium-high investments	Medium-low investments	Very low investments
Input	Conventional & Environmental-friendly use	Environmental-friendly & organic productive systems	Conventional & low-environmental impact use
Type of activity	Specialised grapevine with "origin designations"	Grapevine with "origin designations" and other fruit-trees, high added value	Vegetables and fruit-trees
Urbanisation reaction	Conservative strategy	Socio-environmental function strategy	Reaction of progressive abandonment

Source: our elaboration

5.2 Discussion

Given the main features of the three groups of farms, the traditional type is predicted to be able to continue its profitable agricultural activity due to a strong production structure per se. Indeed, they endow large amounts of land and grow well-established grape varieties with origin designations (DOC, IGT). Moreover, these farmers can rely on pleasant locations for their vineyards, allowing them to intensify marketing and advertising. Since among their main market channels they have foreign markets, this is also proof of a well-functioning mechanism inside the organisation. Although their role in the park's environmental protection can be considered fundamental, unfortunately they are insufficient to guarantee by themselves conservation of social and ecological functions of agriculture.

As regards the second group of farms, termed adaptive farms, they experience some disadvantages, such as medium-small production area per capita and price competition from foreign products. Despite this, the farm managers who belong to this group make great efforts to continue their agricultural activity. Indeed, their products have high added value due to the production methods used, which require a certain level of investment and high labour intensity. While they have adopted a visible social and environmental-protecting strategy to react to the growth of urbanisation, it might not be enough to consider them safe from decline. In this case, strategies that imply mobilisation of resources (i.e. agro-tourism, new on-farm activities, diversification, and nature and landscape management) are not completely expressed. It is to be hoped that new opportunities for them will be created, especially since these farmers, given their age and education level, are the keenest to join the new development project.

A notable feature in this area is the fact that most of the farmers are part or complete tenants. In the sample, this is found particularly in the third group, that of vulnerable farms. In other words, those farmers who would like to continue farming, such as the youngest farmers in the group, are most at risk: the most recent problem mentioned by the interviewees is that once rent contracts expire, owners may not agree to renegotiate them. According to sector experts, the owners are seeking better land-use

opportunities, such as building, rather than wishing to earn the yearly rent from farmland. This phenomenon can be avoided only if the Park Authority, executing with great commitment its sovereign role of area control and management, succeeds in eradicating any ambition to build on protected land, which is now used for farming.

Another problem of general interest raised by farmers is the scarce control of the area by local institutions, on which they lay the blame for widespread degradation of the municipalities belonging to the Park, especially regarding waste management. This issue requires great attention since it compromises the reputation of Phlegrean farm products, creating marketing difficulties. Furthermore, the refuse problem has a negative impact on tourism and agro-tourism, despite the attractiveness and cultural riches of the sites in question.

In light of the critical situation and given the importance of Phlegrean agriculture within the park's boundaries, we identified a rural development opportunity which might let growers be paid back for their services to the community and enhance their earning potential. Every farmer in the sample was asked if he/she would be interested in joining a new development project, known as Community Supported Agriculture (CSA).

US national surveys indicate that CSA farmers are on average about 10 years younger than other farmers and have a much higher percentage of college graduates in their ranks (Stevenson and Hendrickson, 2004). The farms that appear most suited to a CSA project indeed belong to Cluster 2 (adaptive farms), where over 10% of the farmers have a college degree, compared to a zero percentage in other clusters, and the other members of the group are also well educated. Moreover, they are the youngest in the sample. The surveys mentioned above also show that approximately 40% of primary CSA farm operators are women, which compares to a national average of 10% for other types of farms; unfortunately, no information on gender is available for this sample. Cluster 2 farms are also considered the best target for this proposal because their production is mainly environmentally friendly and some have production systems certified as organic. These growers feel a deep sense of belonging to the community, consider agriculture very important for area preservation, and show a certain willingness to undertake the new development proposal. In any case, the most numerous of the sample are farms belonging to Cluster 3, and they are also the most threatened by urbanisation. Thus, at least part of them should become involved in this development initiative, at least as followers, even if their production systems are not as efficient as the others, since more than half of them were willing to take part.

6 Final remarks

This paper analysed the effects of urbanisation on farm organisational and production processes. A theoretical framework originally presented by Heimlich and Anderson (2001) was used and adapted to describe and assess the relationships between urbanisation and changes in farm-styles in the city belt. Our analysis focused on an important protected area in the metropolitan region of Naples, the Campi Flegrei Regional Park, examining the characteristics of a farm sample operating in the park. The park was established to protect and preserve the area's natural, historical and archaeological heritage following a lengthy period of unregulated urbanisation.

Through this study we assessed the possibility of implementing a CSA initiative in the study area, screening the main features of farms more likely to join the project. We aim to transfer our results to local authorities and stakeholders of such a project, thereby contributing to solving agricultural problems in this area. In this context, European rural development policy, under Rural Development Program 2007-2013, can indeed play a key role throughout various measures aimed at promoting an environmental dimension of agriculture. Due to its heritage potential, this area is suitable for implementing a funded project combining agricultural and environmental objectives.

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