Peri-urban agriculture: an analysis of farm typologies in Italy

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Abstract

The article explores the role of peri-urban agriculture in Italy through a comparative analysis of seven metropolitan areas. The structural dynamics of farms are assessed through the micro-data from the sixth Italian agriculture census, identifying six typologies of market-oriented farms that face in different ways the pressures and opportunities of peri-urban environments. The article shows that, although in the main Italian urban poles there is a significant share of farms passively absorbed by the urban forwarding, the most reactive farms are supplying an increasing number and variety of social and economic services to the urban population. Since diversification is becoming a specific business strategy developed by the most structured and market-oriented peri-urban farms, it can turn out to be a relevant asset to enhance the resilience of metropolitan areas and, more generally, to improve the connections between urban and rural areas.

***Keywords**: peri-urban agriculture, post-productivism, multifunctionality, farm typologies, diversification.*

Résumé

Dans cet article, nous allons parcourir le rôle de l'agriculture périurbaine en Italie au moyen d'une analyse comparative de sept aires métropolitaines. La dynamique structurelle des exploitations est évaluée à l'aide des micro-données du sixième recensement agricole italien, en identifiant six types d'exploitations orientées vers le marché qui font face d'une manière différente aux pressions et aux opportunités de l'environnement périurbain. Bien que dans les principaux pôles urbains italiens il existe une forte proportion d'exploitations absorbées passivement par l'étalement urbain, les exploitations les plus réactives assurent aujourd'hui un nombre croissant de services sociaux et économiques diversifiés à la population urbaine. Comme la diversification devient de plus en plus une stratégie d'entreprise spécifique, développée par les exploitations périurbaines les mieux structurées et les plus orientées vers le marché, elle pourrait se transformer en un formidable levier pour accroître la résilience des aires métropolitaines et plus en général, pour améliorer les liens entre zones urbaines et zones rurales.

Mots-clés: Agriculture périurbaine, post-productivisme, type d'exploitation, diversification.

1. Introduction

In the last few years peri-urban agriculture has been deeply investigated from an economic and geographical perspective, in the streamline of interest for multifunctional agriculture and the transition theory postulating the relevant shift from a productivistic to a post-productivistic approach to development (Wilson, 2007 and 2008; Ortiz-Miranda *et al*., 2013). Multifunctionality at farm level means a change in the organisation of the production factors that allows for new remunerative and non-remunerative activities, such as the provision of public goods and services. However, growing at scale level, multifunctionality becomes also a form of organisation and conceptualisation of the space and the territory around multifunctional farms, since "a large number of functions connected to agriculture require a territorial concentration of actions and networks (economies of scale) that may not have sufficient weight at farm level" (Wilson, 2009, p. 273). As a consequence, the conditions of the surrounding territory become essential for farms to fully express their potential level of multifunctionality (Belletti *at al*., 2003).

Following this wide body of theory, peri-urban farming develops specific features and roles that are required by the city dwellers in a sort of continuous balanced exchange, so that cities and peri-urban agricultural areas become functional to each other. Alternatively said, peri-urban agriculture gains increasing importance for its relevant impact on economic, environmental and social dynamics of the urban poles.

Farmers in peri-urban areas follow alternative patterns of behaviour according to their ability to adjust to the ongoing urbanisation: farms may be simply surrounded by the metropolitan development, basically not modifying any behaviour compared to the past; they may adapt to the changes of the surrounding territory; or, finally, they may react to the urbanisation process, assuming new functions and meeting a more or less latent demand for specific goods and services expressed by urban dwellers (Heimlich and Barnard, 1997; Pascucci, 2008; Zasada, 2011). However, this categorisation of peri-urban farms, useful at the first stages of studies on peri-urbanisation, does not seem to catch the full picture, especially because of the evolution of multifunctionality. The process of diversification has become more and more complex, with farms devoting labour and other production factors to new activities or to new forms of agriculture (organic farming, quality products and so on). In economic terms, this has turned into higher shares of income originated by non-agricultural output. In terms of market relationships, farms have also changed pro-

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gressively their connections to consumers, through traditional and innovative channels.

Under such circumstances, and building on this literature, the main objective of this paper is to show the multi-patterned way of change occurring on peri-urban farms in Italy, in a country where agriculture is highly diversified and production is very differentiated. In Italy peri-urban farms are discovering new professional ways to relate to the urban contexts, turning that into a driver of growth and development in the framework of multifunctionality. Given this main objective, we shall follow a three-step process of analysis.

First, we build on the traditional typologies of farmers' behaviour in order to better qualify the different modes of interaction between urban and rural contexts, moving to six different typologies.

Second, we look at the main strategies of peri-urban farmers, in order to identify common features in dealing with the process of urbanisation by modifying their production specialisation and territorial relationships. We look at the farms located in the immediate surroundings of the main Italian metropolitan areas, within the administrative borders of the "urban poles", selected according to the definition provided by the national rural development programme and setting a low threshold of 500,000 inhabitants.

Third, we build a synthetic index of "diversified peri-urban agriculture", whose main purpose is that of supplying a "cluster" of information about the poles through one single figure and make comparisons among them. The index also highlights how there is a gradient of multifunctionality of peri-urban farms that leads to a ranking of the poles under study.

In order to deal with these research goals, we analyse the reaction to the condition of peri-urbanisation of vital professionally led farms that have proper and continuative market relations, both at the local and the long-range level. Other typologies of farms are very important in the economic, social and environmental fabric of peri-urban areas, such as small subsistence or hobby farms; however, investigating their role, which is driven by other mainly non-economic forces, is beyond the scope of this work.

This paper is organised in four sections, as follows. After a literature review on the role of peri-urban agriculture (section two), in section three the objectives and methodology of the article are described. In section four we present the classification of peri-urban farms according to our methodology and the subsequent index of "diversified peri-urban agriculture". In section five some conclusions are drawn.

2. Peri-urban agriculture

Relationships between cities and countryside have historically been influenced by different variables: economic cycles, population density, competition for soil use, residential use of rural areas. From the Eighties onward, agriculture and rural areas have lost their identification with backwardness: rural areas have become sites of consumption as well as of non-agricultural business, whereas farms have moved towards multifunctionality, producing private and public goods and services for the whole community, also as a response to a new demand originated in the urban contexts (Saraceno, 1994; van Huylenbroeck and Durand, 2003).

For more than a decade, multifunctionality has been one of the key-words for identifying the new paradigm of development defined as "post-productivism" (Ward, 1993; van der Ploeg *et al*., 2000). Post-productivism has not built its theoretical foundations in agriculture, but it can help properly explain the deep changes occurring in the primary sector of advanced countries, especially in Europe, and the process of qualitative modernisation going on in agriculture. Farms not only provide agricultural goods and food, but also services to the community (social, recreational touristic, services, to mention the most popular) as well as public goods that are produced as secondary products: natural resources management, water control, landscape management care and so on (Wilson, 2007 and 2008; Moragues-Faus *et al.*, 2013).

The process of modernisation of the primary sector had led to a sort of "industrialisation" of agriculture, characterised by intensification of production and standardisation of output whose main downsides have been the increase of the environmental impact of farming, the progressive decline of small-scale agriculture, the unsustainable use of natural resources, the worsening of agricultural terms of trade, to name a few. The post-productivist paradigm does not imply a dominant model, but rather the co-existence of different agricultural models: small and large scale farms, food and non-food products, non-marketable services, local markets and international trade flows, all fulfilling different and specific societal requirements.

Post-productivism has redesigned the role of rural areas in contemporary advanced economic systems, including a specific feature for peri-urban areas, redefining the relationships between production and consumption and among different playing actors.

In the past, peri-urban farming was somehow neglected both by theoretical and empirical studies, since it was considered a transitional phase of rural areas becoming available for urbanisation and the development of the metropolitan areas. However, in the last few years peri-urban agriculture has been increasingly investigated both in an economic as well as a geographic perspective (Heimlich and Barnard, 1997; Zasada, 2011; Torreggiani *et al*. 2012; Morgan, 2015). These works suggest that farms can be simply incorporated by the metropolitan development, or adapt to the changes of the surrounding territory, or, finally, react and assume new functions meeting a more or less latent need expressed by urban dwellers. This classification, proposed in the works of Heimlich and Brooks (1989) and, more recently, of Pascucci (2008), is based on the change of destination of the farm inputs due to the ongoing urbanisation process. In other words, exogenous forces, like the urbanisation process and the growing pressure on agricultural land for urban purposes, cause different reactions in the farmers whose farm is located in that "grey" area between the urban borders and

the proper open rural areas, bring about a reorganisation of the production inputs, namely land, capital and labour. These authors distinguish three topologies of farms, traditional, adaptive and reactive, behaving in three archetypical ways.

Traditional farms do not change anything of their past organisation and product specialisation, keeping the same level of inputs used on the farm in the same activities. Basically, these farms are progressively absorbed by the urban forwarding frontline and they become enclaves in the urban territories. As a result, labour and the other factors of production are kept all in the agricultural activity, while diversification processes are set at a minimum, if not null level. This does not mean that these farms are necessarily dependent on the urban contexts; quite the contrary, they might be totally independent of local markets, selling their products to distant wholesale dealers or being vertically integrated into the *filière*, like any other professional farm. However, these farms are usually quite dependent on public support, especially on support coming from the CAP first pillar since it is somehow connected with their product specialisation.

Adaptive farms endure the urbanisation process adapting to it, mostly through de-activation and simplification of the farm organisation (for instance through external contracting) and the transfer of labour force outside the farm gates. Adaptation can affect both the farmer (part-time farmers) and the farmer's family members (pluri-activity). This process is mainly driven by the conditions of the non-agricultural labour market, so it is highly dependent on exogenous variables. In this case, diversification processes can be significant, especially because of the adaptation behaviour, so that they will be influenced by the urban market demand, such as quality and typical products. As for public support, their dependence is to be related to the product specialisation and also to the diversification process, however being in peri-urban contexts they have often been excluded from the European funds secured by the second pillar of the CAP.

Finally, *reactive farms* are particularly sensitive to the relationships with the urban context, modifying their specialisation and functions activated on-farm, and moving a substantial part of the production factors outside the traditional farming activities, in new on-farm businesses. For these farms, the diversification process becomes prevalent and, in some cases, it can be quite independent from the main agricultural activity. These farms would theoretically be quite "policy sensitive", since public support would favour income diversification and product differentiation; however, in many cases they have been considered non eligible for access to the second pillar funds due to their peri-urban nature.

These three typologies can be distinguished can be distinguished for their different use of the main farm production factors (land, labour and capital), but here the processes of diversification are influenced, if not driven, by the condition of peri-urban farms, resulting from the urbanization process. While traditional farms continue to use the production factors within the agricultural sector, reactive farms tend to re-organise their business by re-allocating these factors for multifunctional activities that may be either strongly linked to the agricultural production (i.e. food processing) or only partially linked (i.e., energy, tourism). In contrast, adaptive farms react to the ongoing urbanisation process mainly by re-allocating a quota of their production factors towards activities outside the agricultural sector (especially labour), by taking advantage of the broad range of employments offered by the neighbouring city.

Before moving on, some caveats are necessary. First of all, as reported in the literature (Wilson, 2007 and 2008), it is somehow difficult today not to acknowledge a certain degree of multifunctionality and diversification on any farm. Given the several drivers of diversification, the financial support granted and, last but not least, the wide spectrum of old and new functions realised by farms and recognised to them by the contemporary society, we would rather consider multifunctionality as a spectrum along which farms are located. Second, while we may consider that most farms perform a certain level of multifunctionality (that is, they produce some joint public goods more or less consciously), diversification is a specific goal that is achieved only if production factors are activated and moved from one gainful activity to another one, so that farms become a place where a cluster of activities is created by combining inputs and outputs, but where such products often imply competition for the use of production factors and entrepreneurial skills. Finally, if income diversification is pursed outside the farm, inside or outside agriculture, then the labour force is moved into other economic sectors; hence, the farm activity often becomes secondary and the income it generates becomes an accessor source for the whole household.

3. Methodology

The analysis of peri-urban farming in Italy is organised in three steps: (i) the definition of peri-urban farms typologies (ii) the identification of the main features of such typologies by looking at the farms located in the immediate surroundings of the main Italian metropolitan areas and (iii) the building of a synthetic index of "diversified peri-urban agriculture". All the analysis carried out are based on the micro-data of the 6th national Census of Agriculture (ISTAT, 2010).

The micro-data regarding farms located in the main Italian urban poles were extracted and analysed. Starting from the 6083 Italian peri-urban farms located in these areas, we selected the professional ones and those with some diversification activities: the result is a sample of 4022 farms, since 2061 non-professional farms without any other gainful activity were excluded.

With regard to the first step (identification of farm typologies), what distinguishes this article from the recent literature is the focus on professional and market-oriented peri-urban agriculture and the identification of more accurate farms typologies. To achieve this aim, each typology identified in the literature (traditional, adaptive and reactive farms) was split up into two sub-typologies, in order to have

a more detailed and exhaustive classification of the different features of peri-urban farms.

The classification was carried out mainly by using the following conditions: professional/non-professional farms; full time/part time farms; presence of other gainful activities (diversification), weight of direct selling. More specifically, the different typologies were defined base on the following features:

1. *Traditional farms* - farms with less than 50% of direct selling were classified in the sub-typology A (prevailing long chains) and farms with more than 50% of direct selling were classified in the sub- typology B (prevailing long chains).
2. *Adaptive farms* - professional, part-time farms without other gainful activities are included in the sub-typology C (pluri-active) and full time, non-professional farms with other gainful activity in sub-typology D (diversified).
3. *Reactive farms*: sub-typology E includes farms with only one diversification activity while sub-typology F includes farms with two or more diversification activities.

This classification was then used to identify the main features of peri-urban agriculture in selected metropolitan areas in Italy. The urban poles to be analysed were selected amongst the areas classified as urban and peri-urban by the National Strategy Plan for Rural Development 2014-2020 (Storti, 2013; Rete Rurale Nazionale, 2014). The analysis was concentrated on the main metropolitan centres, namely the seven urban poles with more than 500,000 inhabitants. The selected urban poles are listed in Table 1, where the main features are also outlined.

As it may be observed in this table, the classification based on the National Strategy Plan brings in large differences in terms of the number of municipalities involved, the size of the areas considered as well as the structure of the local farm sector. At the same time, this classification was considered the most suitable to analyse the socio-economic dynamics of the different peri-urban agricultural systems, as well as to explore the possible role of policy in stimulating, through appropriate measures and incentives, the multifunctionality and the diversification of peri-urban agriculture. Indeed, unlike recent studies that focus more on the spatial dimension of peri-urban agriculture (Lange *et al*., 2013; Galli *et al*., 2010; La Rosa *et al*., 2014), this research aims at defining the different typologies of farms from a socio-economic perspective, as well as the main social and policy implications deriving from this classification. In particular, a detailed comparison has been made regarding the main socio-economic features of six different typologies as well as their weight and features in the seven urban poles.

Finally, in the last part of the paper, we build a synthetic index to manage through one single index the whole information we have collected for the poles. In other words, our aim is building a one-dimensioned indicator in which we weight different single indicators according to their influence in determining the rate of diversification in the peri-urban agricultures of the urban poles under study.

Clearly enough, the construction of the indicator is subject to the researcher's interpretation and is highly discretional concerning the choice of the variables entering the indicator. In this regard, this methodology is quite similar to the multivariate analysis methods, whose main effectiveness consists in reducing and concentrating information rather than looking for proper cause-effect relationships among variables. Despite these clear limitations, the main goal of such an index is reducing the amount of information to one single number that provides quite a realistic ranking of all the urban poles under study.

4. Results

4.1. Typologies of peri-urban farms in Italy

The classification of peri-urban farms in the six typologies is summarised in Table 2. It can be noticed that, in the main Italian metropolitan areas, almost two thirds of the farms can be considered "traditional" (A and B), while 16% are classified as "adaptive" (C and D) and only 10% can be considered "reactive" (E and F). 11.5% of farms are pluri-active (C), while diversification activities are carried out by 14.4% of farms (D, E and F).

Although the largest share of peri-urban farms belongs to the typology of farms passively absorbed by the urban forwarding, it is interesting to notice that a large number of such traditional holdings are oriented towards alternative forms of commercialisation and short supply chain (the sub-typology B accounts for 28.2% of the total). Whilst all traditional farms are characterised by a professional status and by the absence of diversification, it is worth noting the innovation path developed by this sub-typology, which has also a relative high share of organic area and the highest share, amongst all the farm sub-categories, of area cultivated with quality certification products.

Adaptive farms are composed of two quite different sub-typologies – pluri-active (C) and diversified (D) farms - which can also be distinguished by their main structural features. Pluri-active farms are generally smaller in size compared to the non-professional farms that are adapting to the urbanisation process through the activation of diversification processes. Conversely, the size of reactive farms is well above the average, demonstrating how the adoption of diversification strategies is linked to the

Table 1 - *The urban poles under study.*

	Municipalities (n)	Area (kmq)	Population (n)	Population density (ab/kmq)	Farms (n)	Utilised Agricultural Area (ha)	Average Farm size (ha)
Turin	1	130	872,367	6,710	75	514	6.9
Genoa	1	240	586,180	2,439	548	1,868	3.4
Milan	13	274	1,654,812	6,032	149	3,546	23.8
Monza-Brianza	55	405	840,129	2,072	789	9,684	12.3
Rome	3	1,320	2,684,982	2,034	2,885	43,872	15.2
Naples	21	235	1,650,234	7,010	1,038	2,014	1.9
Palermo	1	161	657,561	4,095	599	2,461	4.1
Tot Urban poles	**95**	**2,766**	**8,946,265**	**3,234**	**6,083**	**63,958**	**10.5**

Source: ISTAT.

Table 2 - T*ypologies of peri-urban farms in Italy: composition and main structural features.*

	Traditional		Adaptive		Reactive	
	A. Prevailing long chains	B. Prevailing short chains	C. Pluri-active	D. Diversified	E. With 1 diversification activity	F. With 2 or more diversification activities
Composition						
Farms (n.)	1,833	1,135	461	188	310	95
Farms (%)	*45.6*	*28.2*	*11.5*	*4.7*	*7.7*	*2.4*
Structural data (average values)						
UAA (ha)	15.4	9.9	10.9	14.7	21.0	27.9
Age farmer	61	59	50	51	52	48
Organic and quality						
UAA organic (%)	*6.7*	*8.8*	*4.0*	*3.6*	*11.5*	*11.9*

Source: Calculations on ISTAT (2010), 6th Agricultural Census.

Table 3 - *Economic features of the six typologies of peri-urban farms.*

	Traditional		Adaptive		Reactive	
	A. Prevailing long chains	B. Prevailing short chains	C. Pluri-active	D. Diversified	E. With 1 diversification activity	F. With 2 or more diversification activities
Standard Output (euro)	60,413	42,513	27,355	46,934	92,981	92,616
Composition farm revenues (%):						
Market	*91.5*	*96.2*	*87.7*	*43.0*	*55.2*	*49.0*
Other gainful activities	*-*	*-*	*1.3*	*52.6*	*40.5*	*44.4*
Public support	*8.5*	*3.8*	*11.0*	*4.1*	*4.3*	*6.6*

Source: Elaborations on ISTAT (2010), 6th Agricultural Census.

Table 4 - *The distribution of the six farms typologies in the main Italian urban poles (%).*

	Traditional		Adaptive		Reactive		Total
	A. Prevailing long chains	B. Prevailing short chains	C. Pluri-active	D. Diversified	E. With 1 diversification activity	F. With 2 or more diversification activities	
Turin	*28.6*	*35.7*	*16.1*	*3.6*	*8.9*	*7.1*	*100.0*
Genoa	*38.5*	*37.2*	*8.4*	*5.3*	*7.5*	*3.1*	*100.0*
Milan	*46.6*	*13.7*	*6.1*	*13.0*	*12.2*	*8.4*	*100.0*
Monza-Brianza	*31.0*	*11.4*	*13.0*	*14.9*	*22.6*	*7.1*	*100.0*
Rome	*45.7*	*34.7*	*11.1*	*2.3*	*5.1*	*1.1*	*100.0*
Naples	*53.1*	*34.1*	*7.5*	*1.6*	*3.1*	*0.5*	*100.0*
Palermo	*61.4*	*14.7*	*21.8*	*0.5*	*1.3*	*0.3*	*100.0*
Total	*45.6*	*28.2*	*11.5*	*4.7*	*7.7*	*2.4*	*100.0*

Source: Elaborations on ISTAT (2010), 6th Agricultural Census.

availability of land. Moreover, this also demonstrates that the adoption of diversification activities may be a specific response to the urbanisation process carried out by the most structured and largest peri-urban farms. Finally, when looking at the farmers' age, the main difference can be observed between traditional farms and all the other typologies. Traditional farms (A and B) are usually managed by older farmers (59-61 years) compared to the other typologies, which have farmers with an average age between 48 and 52 years.

When looking at the economic features of the six typologies (Table 3) and especially to their standard output (SO)[1], data shows that, on average, the economic size of reactive farms is significantly higher than the other categories, especially compared to the two sub-typologies of adaptive farms. Amongst the traditional farms, the highest SO can be observed for the sub-typology A (farms with prevailing long chains). At the same time, when considering the composition of farm revenues, it can be observed how this sub-typology relies more on public support compared to sub-typology B (prevailing short chains), which is more oriented towards a market valorisation of their products in local markets[2]. While pluri-active farms rely more on public support, more than 50% of the revenues of the sub-typology D is ascribable to the other gainful activities carried out. What differentiates this typology from reactive farms is the non-professional status, where on-farm diversification is adopted mainly as a response to socio-political drivers compared to the professional reactive farms.

What is interesting to highlight here is that public support currently plays quite a marginal role for diversified farms (D, E and F) compared to non-diversified farms (A and C). While in highly urbanised environments a pro-active and innovative peri-urban agriculture can be a pillar of a sustainable farming system, these results show that it would be necessary to improve the role of policies in supporting the increasing number and variety of services that peri-urban farms may provide in metropolitan areas.

4.2. Urban poles

After the classification of peri-urban farms into the six typologies, the next step was associating such typologies to the selected urban poles, in order to have an overview of the "reactivity" of professional farms located in the main Italian metropolitan areas (Table 4).

At first glance, it seems that there is a progression of share increase from the more traditional to the more reactive, moving from the South (Palermo, Naples and Rome) to the North (Genoa, Turin, Milan, Monza-Brianza). Within the same typology, the combination of the different sub-typologies varies quite significantly. Among the traditional ones, only in Naples and Palermo, those with a prevalence of traditional markets (A) stand clearly above the average, while Turin, Genoa, Rome and Naples exhibit a share of traditional markets with prevailing direct sale (B) above the average. As for the adaptive ones, the professional ones (C) are more present

[1] The standard output (SO) of an agricultural product (crop or livestock) is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock. The SO per each farm is calculated as the sum of all the SO per hectare of crop and per head of livestock and it represents its overall economic size (expressed in euro). SO excludes direct payments and the production costs.

[2] The higher share of public support for pluri-active farms highlights their dependency on external funding sources in order to survive, in spite of the inflows of financial resources coming from the external non-agricultural activities. This makes these farms very fragile in economic terms and highly dependent on external factors rather than internal ones.

Table 5 - *Main structural features of peri-urban farms in the selected urban poles.*

	Turin	Genoa	Milan	Monza-Brianza	Rome	Naples	Palermo	Total
Farms (n.)	56	226	131	677	1,754	797	381	4,022
UAA (ha)	8.5	6.5	26.5	13.9	22.2	2.3	5.4	14.4
Age farmer	59	56	59	54	60	56	59	58
Main specialisation	Flowers and ornamentals indoor	Various field crops combined	Cereals, oilseeds and protein crops	Cereals, oilseeds and protein crops	Various field crops combined	Fruit	Citrus fruit	Various field crops combined
UAA organic (%)	-	*2.3*	*0.9*	*2.3*	*9.9*	*4.6*	*4.5*	*7.5*
UAA typical products (%)	-	*0.2*	-	-	*0.2*	*0.5*	-	*0.2*
Farms with diversification activities (%)	*19.6*	*15.9*	*23.7*	*44.6*	*8.7*	*5.3*	*2.1*	*14.8*
Main diversification activity	Social and recreational activities	Management of public parks and gardens	Management of public parks and gardens	Management of public parks and gardens	Agri-tourism	Management of public parks and gardens	Processing of livestock products	Management of public parks and gardens

Source: Elaborations on ISTAT (2010), 6th Agricultural Census.

Table 6 - *Economic performance of peri-urban farms in the selected urban poles.*

	Turin	Genoa	Milan	Monza-Brianza	Rome	Naples	Palermo	Total
Standard Output (euro)	24,663	19,784	74,224	58,045	69,572	38,930	26,555	54,226
Composition of farm revenues (%):								
Market	*85.8*	*88.7*	*71.1*	*71.0*	*87.0*	*96.5*	*93.4*	*86.3*
Other gainful activities	*9.7*	*7.8*	*15.8*	*19.5*	*4.1*	*2.6*	*1.0*	*6.8*
Public support	*4.5*	*3.6*	*13.1*	*9.6*	*8.9*	*0.8*	*5.7*	*6.9*

Source: Elaborations on ISTAT (2010), 6th Agricultural Census.

in the North, while the non-professional ones, with a certain level of diversification (D), are featured more in the South. Finally, reactive farms are overall a small share of the total, both farms with only one activity (E) and those with more than one activity (F), with the only exception of Monza-Brianza and, to a lesser extent, Milan and Turin (still in the North). In Table 5 many of the other structural features are summarised.

The number of farms, their size and specialisation are all quite remarkable differences. Farmers' age seems to be more homogeneous, ranging from 54 in Monza-Brianza to 60 in Rome. It seems that the proximity to the city is not a guarantee *per se* of a change in the farm management: farmers are as old as in the rest of the sector.

As far as diversification strategies are concerned, the highest level is reached in Monza-Brianza (44.6%), while in the South the share is much lower. Interestingly enough, in four out of the seven urban poles the main activity is the maintenance of gardens and urban parks, while agri-tourism is significant only in the case of Rome.

Finally, in Table 6 we synthetized data on economic results. The share of revenues from "other gainful activities" reflects their role as accessory revenues in Palermo, Naples and Genoa whereas they play a significant role in Milan and Monza-Brianza. These are also the same poles where the share of public support prevails, which might indicate the role of European agricultural policies in stimulating the farms' diversification process.

4.3. A synthetic index

It appears quite clearly that behaviour concerning agriculture in urban poles is highly variable, not easy to synthesise, and it represents a sort of spectrum of peri-urbanisation and diversification. Therefore, following the methodology used for other indicators like the index of human development or the index of multifunctionality (Greco *et al*. 2013; ISTAT, 2014; UNDP, 2015), we developed here a single indicator for peri-urban farms diversification to help focus on the condition of peri-urban farm.

We first selected and divided indicators into two categories: "structural factors" and "reactivity factors"[3]. The first group of indicators include all structural conditions which can be considered as a pre-requisite for the diversification process in peri-urban areas: the number of farms in the urban pole; the land use (hectares), the share of young farmers and the standard output. The underlying idea is that a higher number of farms, a larger number of hectares available, a larger share of younger farmers and more professional farms are all pre-requisites for the development of diversified activities. This set of indicators was assigned a weight of 1 in the composition of the indicator. The second group of indicators – the reactivity factors – highlights the level of reactiveness of peri-urban areas due to their peri-urbanity condition: the share of farms with diversified activities; the share of farms with prevailing direct selling; the share of organic UAA; the revenues originating from other gainful activities, the share of farms with more than one diversification activity and finally, the share of UAA under PDOs. These indicators reveal the specific strategies and complex entrepreneurial skills in order to diversify the sources of on-farm gainful activities and become multifunctional farms. This set of indicators was given a weight of 2 in the composition of the indicator. Through a synthesis process based on the relative index[4] method, we determined the results reported in Table 7 as a weighted mean of all the sets of variables.

The synthetic indicator stems from a value of 0.09 in the case of Palermo, up to 0.62 for Monza-Brianza. However, what we really observe is a spectrum of diversification in the Italian peri-urban areas, in which structural factors, as well as marketing and economic factors, play a crucial role.

[3] Following the index construction, all variables included are formulated so that the lower the value the more they represent traditional farming.

[4] This method allows to set the values of all the variables used in the indicator in a range going from 0 to 1, so they are all on the same scale (ISTAT, 2014). The formula is as follows:
$IR = X_{ij} - \min X_j / \max X_j - \min X_j$,
where X_{ij} is the series of values i of the specific variable j.

Table 7 - *Synthetic index.*

	Weight	Turin	Genoa	Milan	Monza-Brianza	Rome	Naples	Palermo
Structural factors								
Farms (n.)	1	0.00	0.17	0.03	0.25	1.00	0.34	0.19
UAA (ha)	1	0.23	0.07	1.00	0.47	0.61	0.00	0.10
Share of young farmers (%<40/%>60)	1	0.00	0.56	0.13	1.00	0.14	0.52	0.18
Standard output	1	0.09	0.00	1.00	0.70	0.91	0.35	0.12
Reactivity factors								
Farms with diversification activities (%)	2	0.41	0.33	0.51	1.00	0.15	0.07	0.00
Farms with direct selling (%)	2	1.00	0.73	0.32	0.67	0.57	0.58	0.00
UAA organic (%)	2	0.00	0.24	0.09	0.23	1.00	0.46	0.45
Revenues from diversification activities	2	0.47	0.37	0.80	1.00	0.17	0.09	0.00
Farms with 2 or more div. Activities (%)	2	0.85	0.35	1.00	0.84	0.11	0.03	0.00
UAA quality certification (PDO, PGI, TSG) (%)	2	0.00	0.37	0.00	0.00	0.42	1.00	0.00
Synthetic Index		**0.36**	**0.35**	**0.48**	**0.62**	**0.47**	**0.36**	**0.09**

Source: Elaborations on ISTAT (2010), 6th Agricultural Census.

This wide spectrum of diversification in the peri-urban agricultural areas implies different roles played by these areas in the relationships with the urban centres they sourround, and also a possible different evolution for the future (Vandermeulen *et al*., 2006; Taylor Lovell, 2010; Zasada *et al*., 2011; Marques-Peres *et al*., 2014). From this point of view, a key role is to be played by the specific policies supporting agriculture in rural areas, and specifically by the new rural development planning for 2014-2020.

5. Conclusions

The emerging literature on the relationships between cities and countryside emphasises the strategic role of peri-urban farming, since agricultural activities in a highly urbanised environment have the potential to provide not only local food, but also a broad range of social and environmental goods and services to the urban dwellers. This article aimed at exploring the role of peri-urban agriculture in Italy through a comparative analysis of seven metropolitan areas. The significance of this analysis is mainly related to the classification of peri-urban farms according to their capacity to react to the urban pressures. Our work shows that the structural dynamics of Italian farms, observed by means of the micro-data of the sixth agriculture census, need a more articulated set of typologies of market-oriented holdings, which were built on the main categories defined in the literature (traditional, adaptive and reactive farms). This further articulation of typologies, from three to six, is functional not only to better describe the reality of peri-urban farms, but also to identify strategies of growth and development of these farms in peri-urban areas, and also to highlight the specific support needs of these farms within the agricultural and rural development policies in Europe. The fact that these farms have stable and solid market relationships, makes the difference compared to another agricultural universe of farms, which also contributes to the supply of public goods and diversified activities, but is based on a residential and leisure approach to the activities. In other words, the universe we explored is made up of farms that have kept a commercial approach to the agricultural activity, only evolving in a different manner and adopting different features due to the relationships with the surrounding urban tissue. In this vein, the further articulation into the categories of "traditional", "adaptive" and "reactive" not only implies a larger number of patterns that peri-urban farms can explore in order to develop and grow, but also that they relate to the surrounding environment in many different ways, creating and improving local relationships with different actors, from markets, to institutions, to consumers. All the typologies further developed in this paper show a different behaviour but, with the due differences, they are all compatible with a professional and viable approach to the agricultural activity. The definition of more detailed and precise typologies allowed to obtain a more exhaustive classification of the different features of Italian peri-urban farms, by better identifying the different features of farms in dealing with the process of urbanisation and by modifying their production specialisation and territorial relationships.

Concerning the results, our analysis shows that in the main Italian urbanised environments there is a significant share of adaptive and reactive farms that, potentially, may supply an increasing number and variety of social and economic services to the urban population, as a response to the demand expressed by the urban dwellers but also to the changing support policies coming from the European Union. These policies, in fact, tend to shift the focus of financial support from the mere status of farmer to the environmentally and socially sustainable behaviour and the production of public goods. Consequently, peri-urban farms may find in this redirection of public support new energies and new resources to fight and reverse decline, and to become stronger in the competition for land use facing the pressure of cities and urban institutions. Since reactive farms are usually larger in size compared to the other categories, both in terms of agricultural areas and standard output, this highlights how the adoption of on-farm diversification strategies in peri-urban contexts does not mean marginal or declining agriculture. On the contrary, it can be interpreted as a specific business strategy developed by the most structured and market-oriented farms, which re-allocate the production factors in order to diversify (and to increase) income sources. Another issue highlighted by this analysis is that public support currently plays quite a marginal role for reactive farms compared to traditional farms. It would be necessary to improve the role of policies in supporting on-farm diversification activities of the most reactive peri-urban farms, since in highly urbanised environments a pro-active and innovative peri-urban agriculture could be a relevant strategy to enhance the resilience of metropolitan areas and, more generally, to improve the connections between urban and rural areas.

Diversification and multifunctionality are often successful reactions to urban pressure, which acts as an exogenous driver for farm diversification (Zasada, 2011). While different dynamics regarding seven urban systems were observed

here in terms of farm structure, specialization and strategies, additional research should explain more in detail how the different peri-urban conditions affect the development paths of professional peri-urban farming as well as the development of multifunctionality in different socio-economic settings.

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