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SOCIO-ECONOMIC DRIVERS, LAND COVER CHANGES AND THE DYNAMICS OF RURAL SETTLEMENTS: MT. MATESE AREA (ITALY)

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Abstract: The paper elaborates on the relationship between land cover changes and transformation drivers, by analysing the dynamics that took place between 1990 and 2010 in Mt. Matese area (Italy). Mt. Matese is an interesting case study which was included as a pilot area in the Italian Strategy for Inner Areas. Drivers related to land cover changes include population characteristics, the agricultural and production system, tourist offer, location and settlements dynamics. Land cover changes and the dynamics of studied drivers are analysed in-depth, through a descriptive and multivariate analysis. Results highlight the difficult situation of the study area for many drivers. However, the slow changes in land cover and the potentialities offered by the natural environment, as well as by the agriculture and tourism sectors, outline some development prospects. The paper outlines the current scenario in the area and provides useful references for future policies aimed at setting up this area as National Park and at implementing the Strategy for Inner Areas.

Keywords: Land cover changes, Socio-economic drivers, Rural development, Inner areas, Apennines, Italy

Riassunto: Lo studio esamina la relazione tra i cambiamenti della copertura del suolo e i fattori di trasformazione, analizzando le dinamiche intercorse tra il 1990 e il 2010 nell'area del Monte Matese (Italia). Il Matese è un interessante caso di studio nel contesto nazionale che è riconosciuto come area pilota della Strategia Italiana per lo sviluppo delle aree interne. I driver relativi ai cambiamenti di copertura del suolo includono le caratteristiche demografiche, del sistema agricolo e produttivo, dell'offerta turistica, di alcuni fattori di localizzazione e di altre dinamiche osservate negli insediamenti rurali. I cambiamenti della copertura del suolo e dei driver studiati sono analizzati approfonditamente attraverso un'analisi descrittiva e multivariata. I risultati evidenziano la difficile situazione dell'area per molti dei driver considerati. Tuttavia, i cambiamenti lenti e modesti della copertura del suolo e le potenzialità offerte dall'ambiente naturale, nonché dai settori dell'agricoltura e del turismo, identificano alcune prospettive di sviluppo dell'area del Matese. Lo studio delinea lo scenario attuale dell'area e fornisce spunti di riflessione per le future politiche volte a istituire il Parco Nazionale del Matese e ad implementare le azioni pilota della Strategia Nazionale per le Aree Interne.

Parole chiave: copertura del suolo, fattori socio-economici, sviluppo rurale, aree interne, Appennini, Italia

1. Introduction

In the European Union, rural areas have undergone a rather intense process of transformation in terms of social, economic and environmental aspects (Schuh et al., 2011; OECD, 2006; van der Ploeg et al., 2008; European Commission, 2013).

The analysis of rural transformations is useful in identifying the scope and intensity of existing relationships between natural and anthropic systems and formulating hypotheses on future development pathways. In this paper, territorial development refers to an integrated multi-sector development across a specific portion of territory (Romeo, 2015).

The investigation of rural transformation trade-offs and timing requires reference to the situations created by the specific system of local relations. The diversity existing in the relationship among the various drivers has a two-fold implication: on the one hand, it requires empirical analysis and bottom up approaches to point out the peculiarities of the relations between drivers and changes; on the other hand, these peculiarities may lead to successful as well as critical local situations, even within the same country. In Italy, there is a strong presence of rural areas with critical situations and complex marginality conditions

(Pelc, 2017), mainly due to the peculiarities of the national territory, such as its morphological conditions (MIPAAF, 2013). These conditions create structural weaknesses in transportation and communication networks, which among other things, disfavour the settlement and dynamics of productive activities (Cialdea and Mastronardi, 2014).

Local relations are even more strategic in inner areas, as defined by the Italian Strategy for Inner Areas (SNAI, 2015), where the inner location combines with a remote and mountain context. The Italian Strategy considers "Inner areas" as those territories characterised by "an inadequate access to essential services to assure a certain level of citizenship to their population and that are substantially far from large and medium-sized urban centres that are able to supply adequate healthcare, education and transport services" (Lucatelli, 2014). SNAI classifies inner areas by considering their distance, based on the time necessary to get to the nearest service provision centres. Rail, healthcare and education services are considered. The Strategy focuses on two dimensions: a) preconditions of local development; b) local development projects. The achievement of an optimal level of essential services to citizens (education, healthcare and mobility) is considered a prerequisite of any development strategy. Local development projects represent the fundamental tool to promote development. SNAI has drafted guidelines for each Region with the aim of selecting pilot inner areas (including the one studied in this paper) and to test a new planning development approach, based on the involvement of local stakeholders. Briefly, stakeholders highlight their own needs and write up their local project in an autonomous way. The rollout of the strategy will be influenced by the outcome of this initial pilot phase (Italian Ministry for Economic Development, 2014).

In comparison to this literature background, the paper analyses the territorial dynamics of a specific rural area, focusing on the relationship between land cover changes and transformation drivers. A case study located in Central Southern Italy, Mt. Matese area, has been considered. This area has been selected by SNAI as a pilot project at regional level; furthermore, the Italian Parliament is discussing about the setting up of a National Park in the area, due to its richness in natural resources and biodiversity; moreover, Mt. Matese has a very rich rural heritage, such as stone-built structures, but also geosites and archaeological sites, cultural and agricultural traditions.

The paper investigates socio-economic drivers and land cover changes that occurred in Mt. Matese area between 1990 and 2010. Demographic and socio-cultural aspects, as well as the natural environment and the economic local system were analysed by means of their relevant drivers. A particular focus was put on tourism drivers because of their importance in relation to the characteristics of the study area. Furthermore, the analysis of land cover put a particular emphasis on agricultural processes, as they are useful for future regional spatial and development planning.

After a literature review on "the state of the art" concerning the main economic, socio-demographic and contextual drivers that condition land cover changes and the transformations of rural areas, section three of the paper presents the data and methods followed. Section four shows the results of the analysis; firstly by describing the characteristics of drivers and the land cover transformation occurred in the study area, and then by presenting the multivariate analysis and correlating drivers with land changes. Finally, the main paper findings are discussed, and some conclusions and policy implications are outlined.

2. Theoretical background

Transformations in rural areas take on different forms when their rural characteristics combine with a geographic peripheral position and a socio-economic marginalisation. These transformations have an impact on land cover changes (Salvati et al., 2016).

Some recent studies used various drivers to explain land cover changes, and focused on the dynamics of agricultural processes (van Vliet et al., 2015: Ruiz-Martinez et. al, 2015; van Asselen et al., 2013) and on their main underlying forces. Economic, demographic and social drivers were also clearly involved and investigated. Among the drivers of land cover transformations in rural areas, the literature refers to the following topics (ENRD, 2010; European Commission, 2013):

a) the agriculture land management change (intensification processes, land abandonment);
b) the loss of semi-natural landscape and the weakening of the ability of rural areas to produce the so-called “ecosystem services”;
c) the demographical decline and the ageing of the rural population;
d) the human abandonment of whole areas or urbanisation process.

These drivers may be represented as in Figure 1, to highlight the analytical framework in which the relation between land cover transformation and territorial drivers is studied. The empirical analysis applied in the study area focused more in depth on the specific scope and intensity of territorial interactions between changes and drivers.

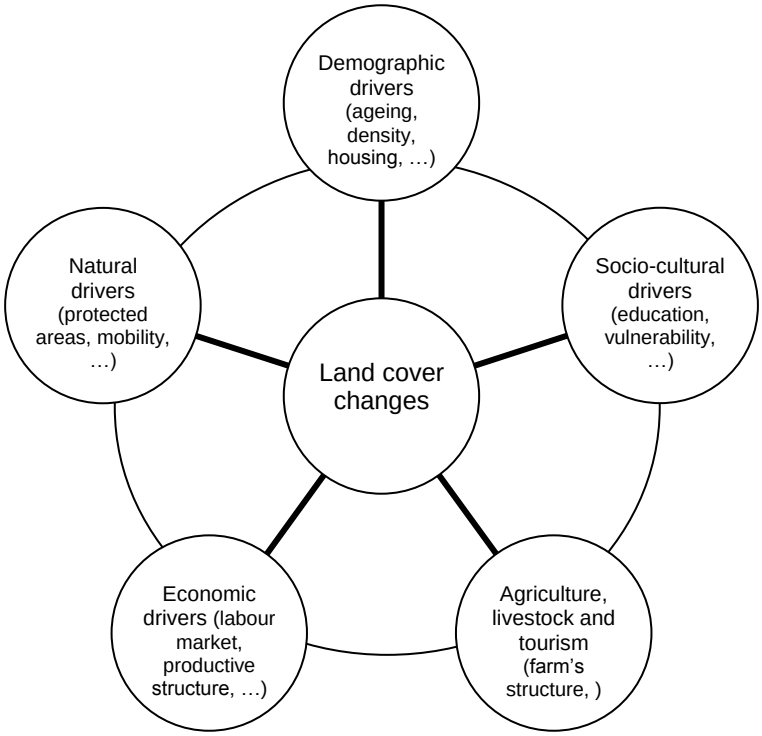

Fig 1. The analytical framework among territorial drivers and land cover changes (modified from van Vliet et al., 2015).

The analysis of agricultural intensification processes is useful to investigate potential socio-economic benefits, such as wealth creation and a slow down of the depopulation of these areas. On the other hand, the understanding of these phenomena could help to control their negative impacts on environmental and natural resources (van der Sluis et al., 2016).

In mountain areas, an opposite phenomena occur in the agricultural sector. Different kinds of degradation processes result in land abandonment and in the decrease of farms (van Vliet et al., 2015). Soil erosion and the loss of traditional landscapes, habitats and cultural heritage are some relevant socio-environmental impacts caused by the abandonment of traditional agro-systems (MacDonald et al., 2000). Moreover, the abandonment of traditional livestock farming systems is considered the main driver of landscape change in mountain areas (Cocca et al., 2012, Palmieri et al., 2017a). Literature highlights how important semi-natural landscape elements of rural areas are for agricultural systems. Pilgaard Kristensen and co-authors (2016) note that during the 20th century, these areas lost most of their functions and were often transformed.

In marginal rural areas, where usually there is no other job opportunity, land abandonment is often closely connected with the migration of people, especially young people, and with the depopulation of entire areas. Migration is often the combination of environmental, economic and social aspects and it acts as a driver that influences land cover change (Kerckhof et al. 2016). Furthermore, population ageing is another driver of change in rural areas that is critical

even from an economic, social and environmental point of view. For instance, it leads to land abandonment, and consequently, the loss of valuable cultural landscapes (Järv et al., 2016). That also means a considerable and negative impact on material and immaterial cultural heritage and a loss in terms of built heritage (Filipe and de Mascarenhas, 2011), and intangible rules, norms and behaviours belonging to rural settlements. Also, when other factors that affect the quality of rural life, such as the existence of transportation networks, education and healthcare services, are lacking, this encourages young people and families to leave rural areas.

All described phenomena appear strictly linked with one another, and land and settlement abandonment seems to be the common element caused by the continuous loss of economic and social relevance of agricultural activities (Figueiredo and Raschi, 2011) and the lack of alternative income sources. The above factors may drive negative changes in the land cover of rural areas, which in turn have remarkable consequences on rural population's life and on residential, historical and natural settlements.

Apart from drivers of negative rural changes, literature underlines many elements whose valorisation could potentially have a positive impact on rural areas development, such as the high level of natural integrity and biodiversity, but also the archaeological and cultural heritage (Lazzari and Aloia, 2014). Furthermore, tourism is one of the most important economic activities that allows the appreciation of rural resources and positively influences income levels in rural areas (Jarábková et al., 2016). Its positive impact is mainly transmitted to population dynamics, especially those concerning young people who may find a source of income, and to the primary sector, as tourism gives farmers the opportunity to diversify farming activities. Some kinds of tourism have even a positive impact on land use, as they help recover rural settlements. Among these tourist offers, we can mention the "scattered hotel", known as "albergo diffuso", a concept of hospitality launched in Italy as a means of reviving small, historic Italian villages and town centres off the usual tourist track, and of saving houses vacated as people moved to cities (Dall'Ara, 2015). Tourism has a central role in revitalising rural areas (Lupi et al., 2017), especially in those areas where a high tourism demand is strictly associated with natural, cultural and gastronomic resources (Ohe and Ciani, 2011; Forleo and Mastronardi, 2008).

Based on the above literature about the main factors conditioning territorial dynamics and land use changes, we selected five drivers that were considered relevant for the characteristics of the study area. In this study, land cover changes are considered the result of the interaction with and among demographic, socio-cultural, economic, agricultural and contextual factors that act as drivers of territorial dynamics (Figure 1).

3. Materials and methods

3.1 The study area

The study area of this paper is Mt. Matese (Figure 2), located in Southern Italy. This mountainous area presents an environmental heritage of such high value that the Italian Ministry of Environment and Land and Sea Protection identified it as a priority in the National Biodiversity Plan. The area is rich in biodiversity, plants (anemones, grape hyacinths, wild orchids; elms and beech trees) and animal species (wolves, foxes, salamanders, owls and other rare birds) (Molise Region, 2013).

The morphology of this area is typical of a vast limestone area longitudinally divided into two mountain ridges, each belonging to a different region. From north to south, the Massif has an extension of about 60 km, while from east to west it measures about 25 km; the highest peaks reach 2000 metres above sea level. Approximately 38.5% of the territory (Source: our elaboration from the cartography of the Italian Ministry of Environment) is protected and hosts parks, natural reserves and sites belonging to the European Natura 2000 Network.

Mt. Matese is located between the Molise and Campania regions. This area includes a total of 34 municipalities (of which 20 are located in Campania and the remaining 14 are in the Molise region). The Molise slope of the Mountain includes the presence of a Site of Community

Importance, the largest in the region (25 thousand ha), called "Gallinola – Monte Miletto – Matese Mountains" (IT7222287) and two regional nature reserves. The Campania slope of the Mountain hosts the Matese Regional Park, established in 2002, which includes all 20 municipalities; this area, which has morphological characteristics similar to the Molise one, is characterised by the presence of a large natural limestone basin (Lake Matese) and two reservoirs (Lake Gallo and Lake Letino), by interesting caves and a vast fossil deposit. The study area also includes many sites of historic interest dating back to the Samnite period and the subsequent Roman domination. The presence of the “Pescasseroli-Candela” cattle track on the Molise side, still preserved in many stretches, is of particular interest in terms of cultural history.

Mt. Matese area is suitable for having an integrated development based on multiple forms of tourism (geological, *en plein air*, sport, gastronomic, cultural, and religious) and which should be analysed to select those forms that rely on strong local identities and attractors.

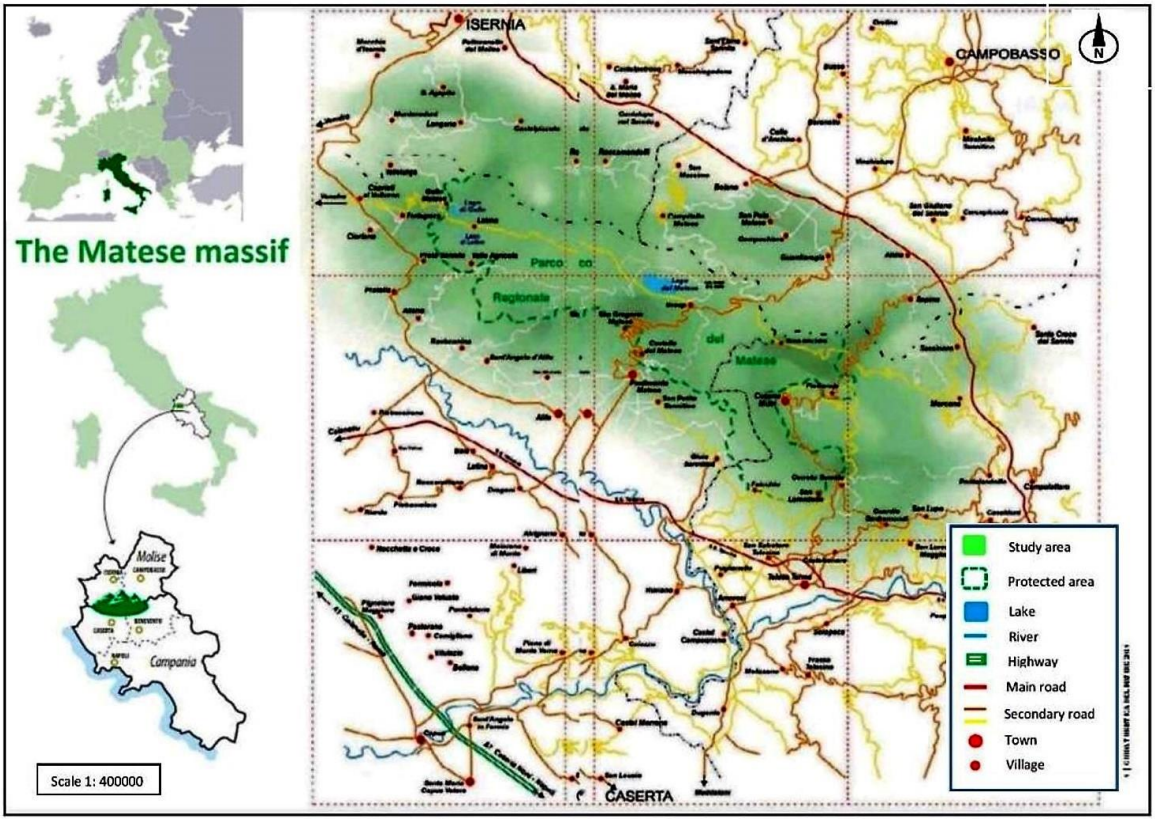

Fig 2. The Mt. Matese area.

3.2 Data and methods

The analysis of rural settlements and their developments in the study area covers the period from 1990 to 2011. This timeframe choice followed the need to use detailed territorial data on different thematic areas and assure, at the same time, a uniform approach to calculate the same indicators over time. For the above reasons, Italian National Institute of Statistics sources were used to get data at municipal level. Census data for different decades were used to calculate indicators related to demographic, entrepreneurial and agricultural settlements and their dynamics (Agricultural, Population and Industrial Census; Italian National Institute of Statistics-ISTAT). It was not possible to get comparable data and indicators for a longer time span.

The whole dataset includes 37 indicators (reported in tables 1 and 2 here below) that represent the status quo of the drivers of transformation and land cover changes reported in the analytical framework (fig. 1): the demographic driver, with several indicators related to population density, age distribution and the presence of foreign migrants; socio-cultural drivers, referred to

the education level and vulnerability indexes; mobility drivers; housing and settlement characteristics and the protection of natural areas; the economic driver, with indicators related to the labour market and the economic system; and finally, agricultural and tourism drivers, with indicators related to farm structure, production specialisation and intensification and tourist offer. Drivers and indicators were selected following several references (Ferrara et al. 2017; Salvati and Carlucci, 2011) and were adapted to the study case and territorial dynamics. Indicators were then built based on three conditions related to available data: i.e. only data collected at town's level, available at least at the three different time points, and based on a uniform approach. The indicators produced in this way allowed us to get a comprehensive overview of the study area and its current situation, as well as the evolution of territorial drivers over time.

To understand the different land transformations that characterised the study area, land cover changes indicators were calculated for the period 1990–2010 using data from the Corine Land Cover database. The selected observation period was a forced choice dictated by the availability of Corine Land Cover data in LCCS 2. The Corine database was considered both for the importance to get data at a thin scale in order to address study aims, and for the good quality of data according to a harmonised EU approach. Based on this data and by applying GIS methods, a matrix of land cover transformation was obtained with a grid resolution of 100 sq. meters, in which each cell represents the uncertainty limit of our data.

The analyses of the current level and dynamics of the above drivers in the local area were based on descriptive statistics and correlation links. A canonical correlation analysis was then implemented. The multivariate analysis of the Canonical Correlations (CCA), also known as gradient analysis, constitutes an extension of the Principal Component Analysis (PCA; Hotelling, 1936) to the case of two groups of quantitative variables observed on a sample, in which one of the two groups can be interpreted as a set of explanatory variables, or factors of the phenomena observed in the second group. The CCA highlights the relationship between dynamic driver indicators in the period 1990–2010 and land cover transformation in Mt. Matese area. The CCA analysis considers 34 municipalities, 28 dynamic drivers of territorial pressure, and 9 transformation processes of land cover changes. The number of dynamic indicators was reduced to 28 from the 34 indicators in the early dataset after a preliminary Analysis of Main Components applied to the initial dataset, and due to the absence of some indicators in the past census (i.e. AGR3 part time jobs in agriculture). All cases, drivers and transformation processes were reduced to a set of 8 axes, or major components, with decreasing importance in terms of the variance explained by each axis.

The results of the analysis are presented in the following paragraphs. A description of the status and dynamics of socio-economic and agricultural drivers is followed by an in-depth analysis of the transformation processes observed in the study area. Finally, correlations among land cover drivers and transformation processes are investigated through the multivariate analysis.

4. Results

4.1 Socio-economic drivers of territorial change

This section describes the socio-economic characteristics of the study area and points out the phenomena that may have driven land cover changes (tab.1).

A general overview of the demographic structure of Mt. Matese area shows a situation consistent with it being an inner mountain area. Its demographic density has a mean value of 70 inhabitants per sq. km (and the median is less than 62 inhabitants per sq. km). Only three municipalities show data above the threshold value of 150 inhabitants per sq. kmq used to define rural areas (Dijkstra and Poelman, 2014). Mt. Matese area is classified predominantly as rural (Molise Region, 2013). Furthermore, only three municipalities have more than 5000 inhabitants, while the whole area has a total of 74,165 inhabitants. Settlements have quite a small size and 76% of the population live in scattered houses; the above indicators and the population density index have quite a high coefficient of variation.

Most EU regions are affected by an increased presence of ageing population, due to a significant and continuous increase in life expectancy (European Commission, 2016). Rural,

relatively remote and sparsely populated areas often show a high ageing index; in these areas, the low proportion of working age population is partly linked to lack of employment and education opportunities, and this pushes the younger generations to leave in search for better job or education opportunities. As concerns the age distribution in the study area, all indicators present a low variation. On average, the incidence of the population under the age of 6 is only 5.6%, while the ageing ratio is about 10%. The dependency ratio is quite high (from an average ratio of 1/3 to a maximum of one elder person out of every two individuals aged 14–64). In the studied settlements, the presence of foreign population is not significant and is set at about 9 foreigners per 1000 nationals, although their distribution presents some variability.

Tab 1. Descriptive statistics of current indicators of socio-economic drivers (year 2011).

Drivers	Code	Indicator	Mean	Min	Max	Median	Std dev	Coeff. of var.
Population & Education	P1	Population density	70.02	18.24	275.18	61.88	52.80	0.75
	P2	% of urban area/municipality area	2.55	0.45	10.60	1.83	2.34	0.92
	P3	% of population living in scattered settlements	36.35	0.55	75.96	40.71	21.51	0.59
	P4	% of population aged less than 6 years	5.63	4.20	7.02	5.57	0.64	0.11
	P5	% of population aged more than 75 years	10.42	7.02	14.76	10.05	2.09	0.20
	P6	Elderly dependency ratio	33.57	23.14	47.16	32.85	6.52	0.19
	P7	% of foreign residents	9.10	1.54	19.92	8.72	4.53	0.50
	P8	Average household size	2.58	2.23	2.82	2.62	0.17	0.06
	P9	% of adults with diploma or university degree / % with middle school	97.47	51.23	161.08	94.19	30.15	0.31
Housing and settlements	A1	% of private houses	78.48	64.08	87.88	78.37	5.99	0.08
	A2	Residential potential in urban areas (% of not occupied houses/total houses)	32.31	11.31	83.02	29.60	14.88	0.46
	A3	Residential potential in scattered settlements (% of not occupied houses)	29.40	12.73	74.42	26.15	14.37	0.49
	A4	Average age of recent houses	23.49	17.57	28.36	23.12	3.08	0.13
	A5	(%) of buildings in poor condition	3.04	0.00	12.71	2.44	2.64	0.87
	A6	Building expansion index (% of recently built houses)	6.55	0.37	34.17	5.65	5.86	0.89
Labour market and structure of productive system	L1	% of youth 15–29 years neither employed nor in education or training	34.24	25.98	44.10	34.56	4.63	0.14
	L2	Female unemployment rate	25.24	12.43	36.67	24.19	6.59	0.26
	L3	Youth unemployment rate	52.12	26.57	76.17	54.27	11.97	0.23
	L4	Labour turnover index	243.18	151.15	447.85	227.16	62.47	0.26
	L5	% of employment in the agricultural sector	22.11	6.31	49.48	19.22	10.08	0.46
	L6	% of employment in the manufacturing sector	27.14	13.16	44.30	25.96	7.59	0.28
	L7	% of employment in the tertiary sector (excluding the trade sector)	36.40	23.31	53.87	35.27	8.26	0.23
	L8	% of employment in the trade sector	14.35	6.37	21.30	14.46	3.03	0.21
	L9	% of employment in low skilled labour	19.92	13.53	45.33	18.62	6.02	0.30
Mobility	M1	Mobility for study or work (%)	23.21	11.65	34.66	23.64	5.96	0.26
	M2	Mobility with private cars (%)	49.17	31.74	67.94	48.91	8.09	0.16
	M3	Long distance mobility (%)	4.31	1.90	11.28	3.56	2.23	0.52
Vulnerability	V1	Social and material vulnerability index	100.82	98.36	104.22	100.85	1.14	0.01
	V2	Position in the national ranking for vulnerability index	1890.14	280.00	4350	1611.75	939.09	0.50

The potential for residential housing is similar in main centres and scattered settlements: in both cases, one-third of dwellings are not occupied. In addition, the highest value of both indicators (83% in main centres and 74% in scattered settlements) and the high variation coefficient indicate that the situation is very diverse within the study area. Real estate indicators show that only 7% of houses have been built over the last decade, but the proportion of poorly maintained houses is only 3%. Even in these cases, the difference between the maximum and minimum levels and the variation coefficient indicate that there is a high dispersion in the distribution of indicators in the study area. Finally, the incidence of newly built houses (7%) and the proportion of private property (78%) have a fairly homogeneous distribution in the data set.

The situation of the local labour market is quite difficult, especially for the young generations. The percentage of young people in a non-active state (the ratio between the population aged between 15 and 29 years who do not study and do not work, on the total population aged between 15 and 29 years) measures the difficulties of younger generations to enter the labour market: more than one-third of young people cannot find a job after completing their studies. Their difficulties on the local labour market are confirmed by the low labour turnover: employed people aged 45 and over, in fact, are more than twice as those aged 15–29 years. Furthermore, the youth unemployment rate (the ratio between the population aged 15 to 24 years looking for employment on the total population of the same age) exceeds 50%. This indicator measures the excess of labour supply with reference to the age group considered over the labour demand expressed by the local economic system. Finally, female unemployment rates are not far from those of the young population.

The employment rate per sector of economic activity shows a ranking that sees the tertiary sector in top position (36%), followed by the manufacturing sector (27%), the primary sector (22%) and the trade sector (14%). The municipalities of the area show greater employment rate variability in the primary sector rather than in other sectors. The incidence of people employed in unskilled jobs on total employment is on average 20%; however, in some cases this value can even reach 45%.

Mobility is a relevant topic in mountain and inner areas. In the study area, on average, 23% of the population aged 15–64 commute daily for work or study purposes. About half of them use private transportation for their daily mobility and it takes more than 60 minutes for 4% of them to reach their destination.

The social and material vulnerability index is an indicator built by ISTAT that indicates a potential vulnerability risk (http://ottomilacensus.istat.it/). This index is the mean of the standardised values of the following indicators: 1) percentage of the population aged 6 and over with no education qualifications; 2) percentage of households with potential economic distress; 3) percentage of households with potential welfare problems composed only of seniors; 4) index of housing in severe crowding conditions; 5) percentage of households with 6 and more members; 6) incidence of single-parent families; 7) percentage of people aged 15–29 years in non-active and non-students status. Due to the construction method of the indicator, its values are within the range 70–130 and the higher the index value, the higher the level of vulnerability. The value index for Italy is equal to 100. The average value for the towns in the study area is around 100, with a very low coefficient of variation. The ranking value of the vulnerability index refers to the position occupied by municipalities in the national ranking, sorted in descending order with respect to the value of the town vulnerability index. The position in the national index ranking is useful to compare the various municipalities. A low value indicates a severe social and material vulnerability. In this regard, being the Italian municipalities 8.092 in total, the average risk index value of 1890 in the study area indicates a high potential for vulnerability.

The above vulnerability is in line with the transformations that occurred in other territorial drivers. As previously indicated, low and decreasing youth and female employment rates show the weakness of the local labour market and this discourages young people and women from entering the labour market, thus reducing the number of people seeking employment. The weakness of the local labour market is sustained by other phenomena, such as the growth

in the value of active people turnover index (percentage ratio between the population potentially leaving the labour market and the population potentially entering it) and the weight of the low-skilled manpower. Finally, the productive structure in Mt. Matese area seems to emulate the typical evolutionary dynamics of post-industrial economy, i.e. a decreasing weight of agricultural and industrial sectors and a growing weight of the tertiary sectors (Forleo et al., 2007). The decline in the weight of the agricultural sector occurred mainly in the 1990s (the period in which the weight of all other sectors showed slight increases), while the decline in the industry's role and the increase in the tertiary sector were observed mainly in the first decade of 2000 (while the role of the primary sector remained stable).

4.2 Characteristics and dynamics of agriculture and tourism

The purpose of this paragraph is to describe the characteristics and dynamics of primary and tourism sectors that play an important role in the productive system of the study area (Tab. 2).

In 2010, 6,047 farms in Mt. Matese area covered 60,147 ha of the total surface and accounted for 37,284 ha of the agricultural area used. The average business size is 9.95 ha. The percentage of farm land dedicated to agricultural uses (about 62%) also gives an idea of the huge weight of forest surfaces and natural and semi-natural areas. In the study area there is a strong presence of farms with arable crops (72% of the total) and farms with livestock (44%).The percentage of farms with tree crops ranges from a minimum of 12% to a maximum of 64%, highlighting the variability in the land use for tree crops, which reaches a high incidence only in some areas of Mt. Matese. The livestock density index, measured in adult livestock unit per hectare of fodder area, is on average 0.58 units (maximum value 1.33), and highlights the extensive utilisation of surfaces for livestock in the area.

Between 1990 and 2010 the percentage of farms with permanent crops slightly increased, while the incidence of holdings with arable crops and livestock decreased. However, this trend is not uniformly spread in the area, as the high value of the variation coefficient indicates. Despite the number of holdings has decreased, the animal husbandry index has increased, but this phenomenon affected only a few municipalities in the area.

Tab 2. Descriptive statistics of agricultural and tourism indicators (year 2011).

Drivers	Code	Indicator	Mean	Min	Max	Median	Std dev	Coeff. of var.
Farm's characteristics and production	AG1	% farms < 2 ha/total farms	47.26	12.58	78.73	52.77	20.58	0.44
	AG2	Grazing livestock density index (no.of cattle, sheep and goats, and equidae converted in Livestock Units/hectare of fodder area)	0.58	0.10	1.33	0.57	0.28	0.48
	AG3	% of part time farms/Total farms	53.11	14.00	83.61	55.17	18.17	0.34
	AG4	% of farms with arable crops/Total farms	0.72	0.30	0.97	0.71	0.15	0.22
	AG5	% of farms with permanent crops/Total farms	0.12	0.00	0.64	0.04	0.14	1.20
	AG6	%. of livestock farms/Total farms	0.44	0.14	0.80	0.42	0.18	0.40
Tourism offer	T1	No. of beds in tourism facilities/kmq	1.64	0.00	20.38	0.77	3.49	2.12
	T2	% of beds in agritourism	19.53	0.00	100.00	3.53	29.61	1.52

The above characteristics of agriculture in the study area closely link with farm and rural tourism development. In 2012, tourist accommodation in the area amounted to 218 beds, with a prevalence of housing in non-hotel facilities (198 beds, including farmhouses and B&Bs), compared to hotel facilities (20 beds). In particular, farmhouses amounted to 99 beds (45% of total beds). However, data referring to the entire area conceals that the high concentration of tourist offerings is limited to only three municipalities in Mt. Matese area, which are destinations for winter tourism. In the studied decade, the number of complementary accommodation increased, while the number of hotels remained almost unchanged. The tourist offer was 2,442 beds in total: 1,051 in hotels and the rest in complementary facilities, such as farmhouses

which offered 370 beds. In the last decade the number of beds has almost doubled: this dynamics is mainly due to an increase in beds in complementary facilities rather than an increase in the accommodation capacity of hotels. Farmhouses registered an increase of 227 beds.

Overall, the average tourist accommodation in the area is quite modest (11 beds), with a higher value for hotels (53 beds) and a lower offer in complementary facilities (7 beds) and farmhouses (4 beds). In the last year, almost all Mt. Matese settlements registered the presence of accommodation facilities (86%), while in 2002 more than half of the settlements (54%) did not host tourist facilities. Although tourist accommodation facilities in the area are not many, the above-described situation shows positive dynamics in the tourist sector – whereas trends in all other drivers show a decline and the local context is overall very weak – and this indicates a tourist potential that could be further developed if combined with the richness of the natural and cultural heritage of the area.

With reference to farmhouse accommodation, its potential is strongly linked to the characteristics and size of farms in the area that create opportunities or obstacles to the development of multifunctional farms and the diversification of farm income. In this regard, it must be said that the size of farms is not high in the area: on average, in the municipalities of the area, 47% of farms have less than 2 hectares of land. Secondly, a decrease has been observed in the number of farms in the last two decades. The total area and the cultivated area also decreased by 28%, and the average surface area of farms decreased by 20%.

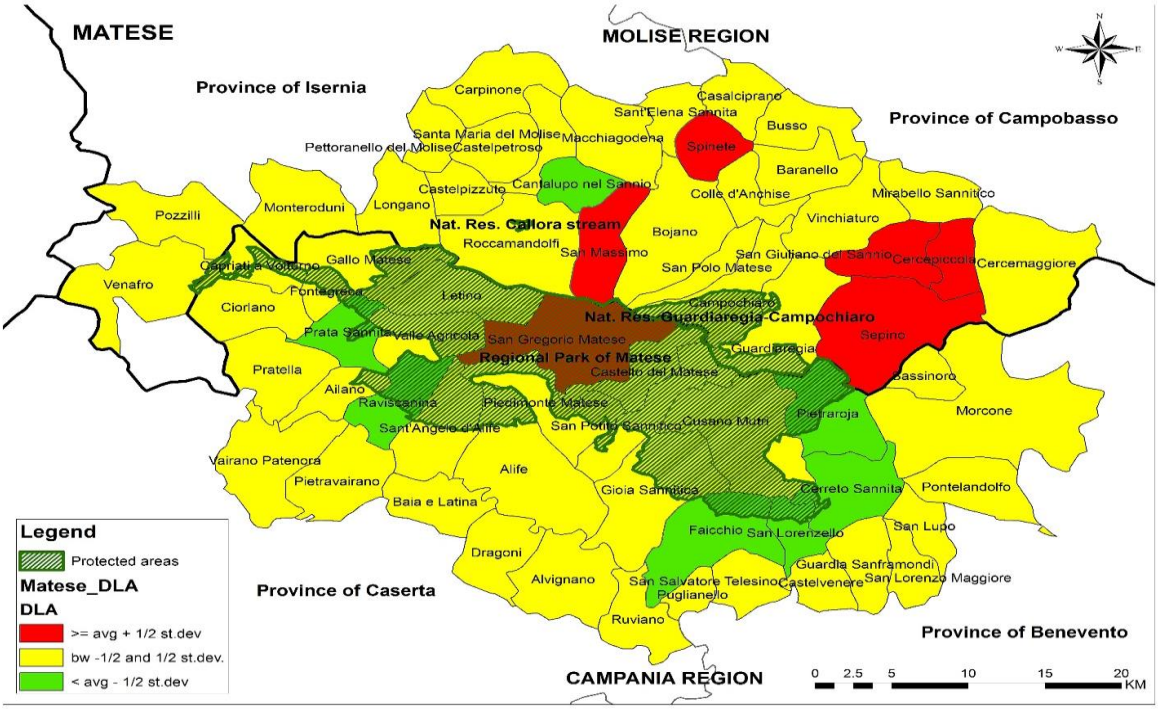

Fig 3. Cartographic representation of the DLA index.

The red coloured municipalities present a higher dynamic of small-scale farms, green coloured municipalities have a higher dynamic of all farms; yellow coloured municipalities present a lower dynamic of small-scale farms compared with the dynamic of all farms.

With regard to the number of farms, the dynamics of small-scale farms (below 2 hectares of surface area) were compared to the dynamics observed in the total number of farms. The ratio between the two indices measures the relative dynamic of small-scale agricultural farms to all farms (called DLA index). If greater than one, the DLA index highlights that the dynamics of small holdings (in particular, their mortality, when the two indicators are negative) is greater than the dynamics of total holdings. Figure 3 shows the DLA index in the municipalities of Mt. Matese area. The figure shows that the mortality of small holdings is generally lower than that of total farms, but in the Molise area it is relatively higher than in the Campanian area of Mt. Matese.

It would be interesting to conduct a further in-depth analysis to verify the hypothesis that the presence of the Regional Park in the Campanian area of Mt. Matese attenuated the decline of small-scale farms. A verification of this hypothesis and its implications in terms of farm and rural tourism development would also be interesting in the light of the recent proposal to merge the two slopes of Mt. Matese into a single National Park. Finally, even if the correlation coefficient between status and dynamics indicators does not have a high value (-0.55), it however indicates the existence of a negative correlation between the incidence of small farms and their dynamics in the timeframe considered: the greater the incidence of small farms and fragmentation phenomena, the smaller the dynamics (showing a decline) of small farms compared to the total of farms.

4.3 Correlations among the drivers of territorial change

The above socio-demographic, economic, agricultural and tourism situation of Mt. Matese area shows interesting correlations between both current status indicators and dynamic indicators (labelled with DIN_ followed by the name of the current status indicator). Due to the size and complexity of correlations, the matrix is not included in this study (data is available on request). Many correlation coefficients have a statistical significance greater than 0.05.

With regard to status indicators, the main connections are described below.

The population density indicator has many significant connections. It is positively related to both the size of urban areas and the average size of households. A high population density is also related to a high percentage of adults with a high level of education and to the index of mobility by private car. In addition, density is correlated with a high employment rate in both the tertiary and trade sectors. On the other hand, the higher the population density, the lower the incidence of owned houses, the housing potentiality in scattered settlements, study or work mobility, ageing index and dependency ratio.

The incidence of the population under the age of 6 is negatively correlated with both the ageing index and the percentage of private housing. The negative correlation with the incidence of private houses can be probably due to the existence of budget constraints on young families in supporting the cost of buying a house. The positive correlation of the percentage of children with female unemployment rate just strengthens this interpretation.

Considering the weight of the adult population, the ageing index and the dependency ratio seem to be somehow correlated. They are negatively correlated with the average size of the family, with female and juvenile unemployment rates, and mobility with private cars. In addition, the incidence of the elderly is related to a higher employment rate in the agricultural sector and the incidence of livestock holdings. Other positive correlations are the percentage of private accommodation and poorly maintained houses.

The percentage of foreign population in the study area has several negative correlations. It is higher in the presence of a lower youth unemployment rate and unskilled jobs, and in contexts with a low risk of social and material vulnerability. The presence of migrants has positive correlations with the proportion of educated adults and occupation in the trade sector, which are usually high in urban areas. The ratio of adults with a diploma or university degree is positively associated to the employment rate in the tertiary and trade sectors, the incidence of part-time farms and private mobility indices; on the other hand, the presence of foreigners is negatively associated to the employment rate in the agricultural sector.

The incidence of private housing has many significant correlations. It is positively correlated with the housing potential of both urban areas and scattered settlements. It is also associated to the weight of arable crops and livestock holdings. On the other hand, a negative correlation exists with the incidence of educated people, with female and juvenile unemployment rates, and with employment in the tertiary sector. An increased housing potential in urban areas is associated with a low level of occupation in the service sector and with tourist accommodation facilities. A higher urban expansion index is negatively correlated with social and material vulnerability indices.

As concerns the labour market, female and juvenile unemployment rates are positively correlated with each other and with the employment turnover index. Both unemployment rates are associated with long-distance mobility, and this can be determined by the search for job opportunities outside the town of residence. Lastly, it seems very interesting that unemployment, labour turnover and employment rates in agriculture are positively correlated with the impact of the surface area destined to protected areas and with vulnerability indices. High employment turnover is positively related to both the incidence of unskilled occupations and the percentage of small-scale farms; however, it is negatively correlated with the employment rate in the manufacturing sector.

Several correlations involve indicators related to the agricultural and socio-economic context: a higher employment rate in the agricultural sector is correlated with a higher percentage of unskilled jobs and a higher social and material vulnerability index. Employment rates in agriculture are negatively correlated with employment rates in other productive sectors such as manufacturing, tertiary and trade sectors. A higher percentage of small-scale farms are positively associated to the incidence of forms of part-time farming and the weight of permanent crops, while it is negatively linked to the incidence of livestock holdings and of farms with arable crops.

A correlation analysis has also been applied to dynamic indicators. In this case, there are less statistically significant linkages, as shown in Table 3.

Tab 3. Framework of the correlations among dynamic drivers and related indicators (minimum significance level at $p < 0.01$).

Drivers	**Population & Education**	**Housing and settlements**	Labour market and structure of production system	**Mobility**	**Farm's characteristics and production**
Population & Education	DIN_P1, DIN_P5 (-) DIN_P5, DIN_P6 (+) DIN_P5, DIN_P7 (-)	DIN_P1, DIN_A2 (-) DIN_P2, DIN_A6 (+) DIN_P8, DIN_A1 (+)	DIN_P1, DIN_L1 (+) DIN_P2, DIN_L2 (+) DIN_P5, DIN_L4 (-) DIN_P6, DIN_L4 (-)		
Housing and settlements			DIN_A6, DIN_L2 (+)		
Labour market and structure of productive system			DIN_L3, DIN_L4 (+) DIN_L6, DIN_L7 (-) DIN_L6, DIN_L8 (-) DIN_L6, DIN_L9 (-)	DIN_L2, DIN_M1 (-)	
Farm's characteristics and production					DIN_AG5, DIN_AG6 (-)

As expected, demographic and education-related indicators show statistically significant correlations with other dynamic phenomena, in particular with housing and settlement dynamics indicators, and labour market and production system dynamics. In other words, greater dynamics of demographic drivers are positively linked with the dynamics of urban and socio-economic development indicators.

In summary, the correlation matrix analysis highlights the complexity of existing relationships between indicators belonging to the same driver and indicators belonging to different drivers. In addition, the links between current indicators and dynamic indicators reveal the existence of an intertemporal dimension of the investigated phenomena, whose present characteristics are rooted in the past (Forleo et al., 2007) and which, in some cases, show a further deterioration of local conditions, while in other cases reveal a stationary situation in development conditions (critical) in the study area.

4.4 Land transformation phenomena in Mt. Matese area

The purpose of this section is to highlight the land transformation processes that have occurred in the study area in order to finally relate driver dynamics and land changes.

The analysis of land changes is based on the European framework and the application of Corine Land Cover up to a second level of detail (Table 4).

Tab 4. Categories of land transformation processes.

ID	Indicator	Process Name	Corine 1990	Corine 2010	% of surface	Description of the process
1	**UC**	Urban Persistence	1	1	0.85	Permanence of artificial areas
2	**AC**	Agricultural Persistence	2.1 2.2 2.3 2.4	2.1 2.2 2.3 2.4	35.90	Permanence of agricultural areas
3	**NC**	Natural Persistence	3 – 5	3 – 5	58.10	Permanence and/or conversion between natural areas
4	**URB**	Urbanisation	2.1 – 2.4 3 – 5	1	0.55	Land loss for setting up of artificial areas
5	**DUR**	Deurbanisation	1	2.1 – 2.4 3 – 5	0.12	Increase of land by artificial areas
6	**INT**	Intensification	2.1, 2.3	2.2	2.35	Conversion from herbaceous crops to tree crops
			2.4	2.1 – 2.3		Conversion from crops mixed with natural areas (heterogeneous) to herbaceous and tree crops
7	**EXT**	Extensification	2.2	2.1, 2.3	0.87	Conversion from tree crops to herbaceous crops
			2.1 – 2.3	2.4		Conversion from herbaceous and tree crops to crops mixed with natural spaces (heterogeneous)
8	**DET**	Deterioration	3 – 5	2.1 – 2.4	0.73	Conversion from mainly natural to mainly agricultural areas
9	**NAT**	Naturalisation	2.1 – 2.4	3 – 5	0.53	Conversion from mainly agricultural to mainly natural areas

On about ⅔ of the study area, land cover (Figure 4) is characterised by the presence of forests and semi-natural areas, mainly beech-trees forests and pastures at altitudes exceeding 800–900 meters above sea level, oaks and mixed forests at lower altitudes. The main basins of the area are the Matese lake, of limestone origin, located about 1000 meters above sea level, and Gallo and Letino artificial lakes, located in the Lete Valley. In the remaining ⅓ of the area, land cover is dominated by the presence of surfaces destined to agriculture, characterised by a mosaic of crops, grassland, and heterogeneous agricultural areas interspersed with natural spaces. On the Campanian slope of Mt. Matese there is a prevalence of arable land, meadows, heterogeneous agricultural areas and permanent crops.

Based on the current level and land cover changes, nine categories of transformation processes have been identified, as shown in Table 4. Over the last two decades, land cover changes accounted for about 6% of the territory in the study area (corresponding to 6,430 ha), while agricultural persistence phenomena and natural persistence phenomena accounted for 36% and 58%, respectively. The high percentage of natural persistence phenomena is easy to understand if we consider that 31% of Mt. Matese area falls within the definition of protected area.

Other land cover changes are attributable to transformation processes –intensification rather than extensification processes– in the use of agricultural land. The transformation of areas destined to forests and semi-natural areas into agricultural areas (degradation) occurred in a few cities of Molise (Sepino and Roccamandolfi) and Campania (Alife, Cerreto S. and San Potito S.). These conversion processes prevailed over the natural processes caused by the abandonment of cultivated lands (Figure 5). Urban phenomena are somewhat modest and have affected few municipalities in the Molise region.

Overall, the environmental degradation processes of the area have been slightly more prevalent than the re-qualification processes. However, deterioration phenomena occurred mainly outside the protected areas represented by parks and natural reserves.

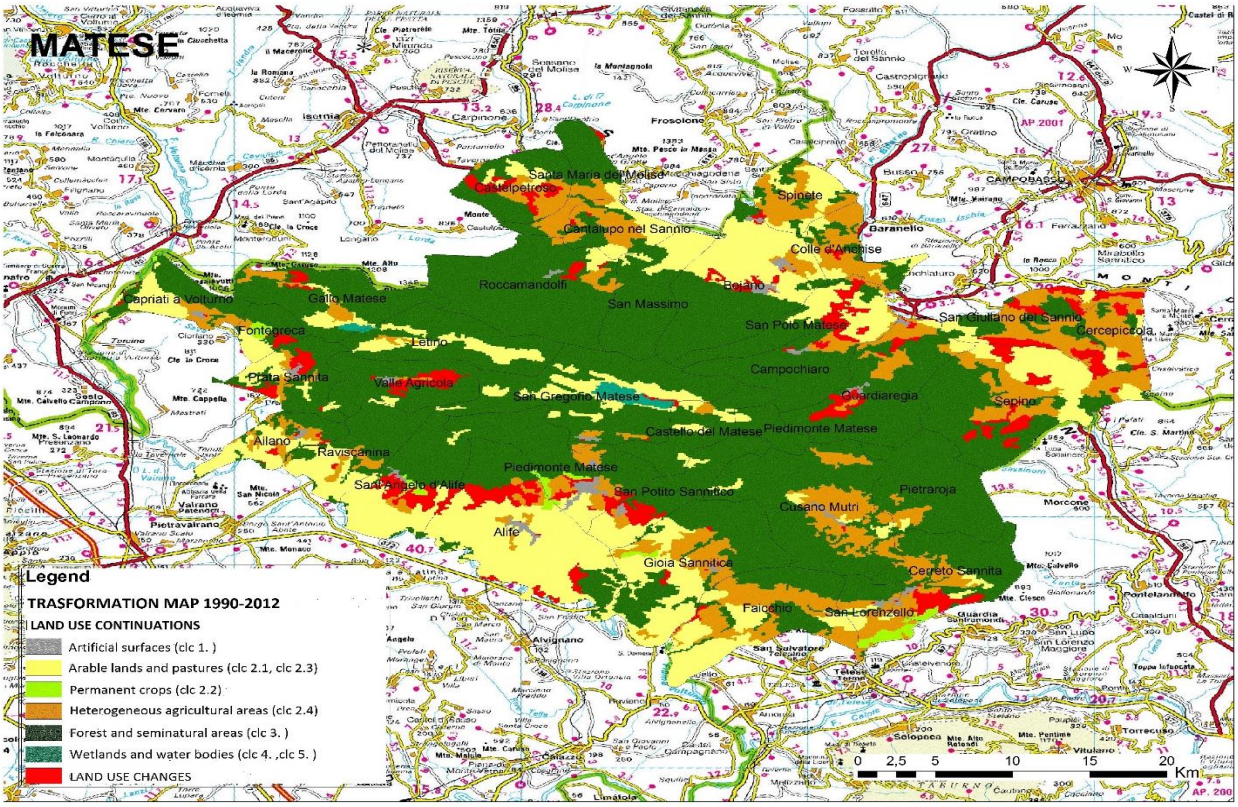

Fig 4. Land cover changes in the Matese area from 1990 to 2010.

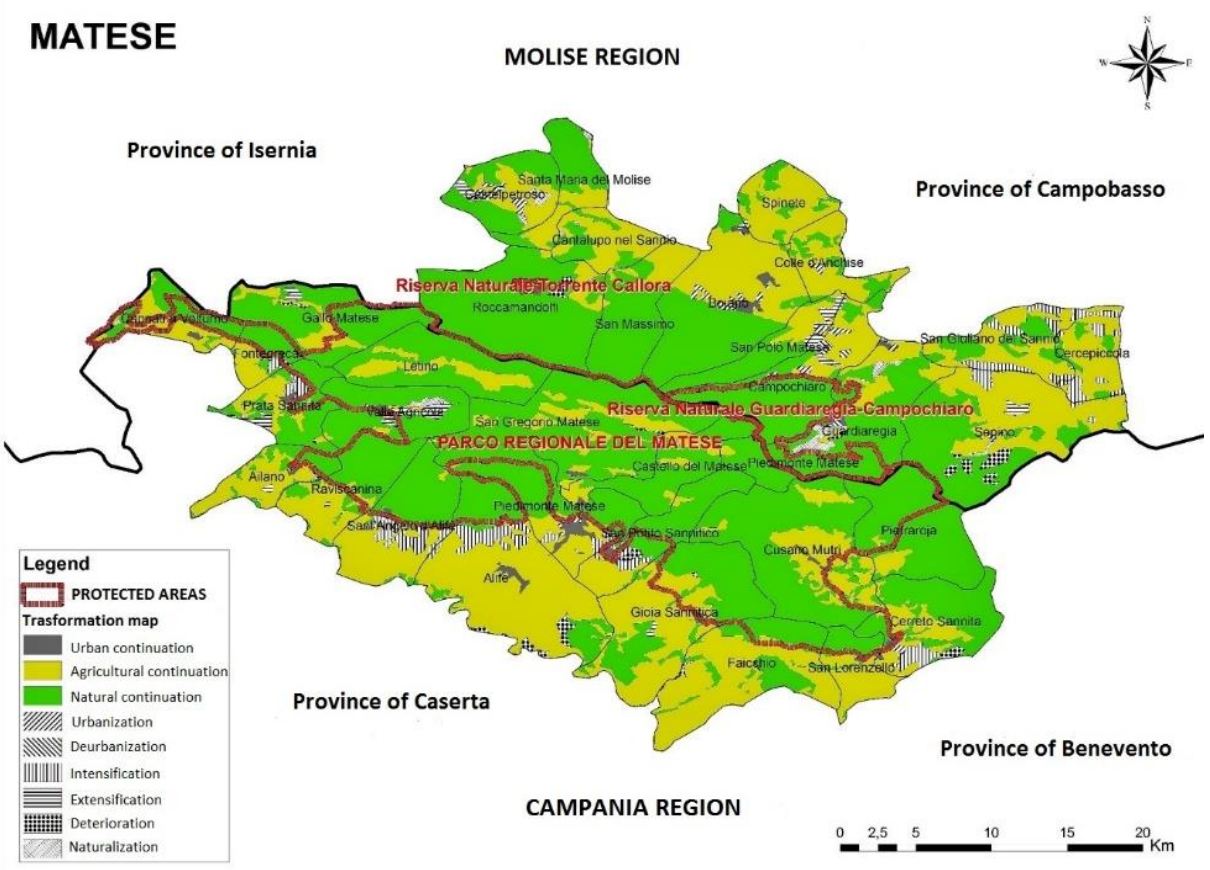

Fig 5. Map of transformation processes in the Matese area from 1990 to 2010.

4.5 Socio-economic drivers and land cover transformation

The status and dynamics of socio-economic drivers could have caused land cover transformations in the study area.

To this end, a CCA analysis was applied to highlight the relationship between demographic, socio-economic and agricultural drivers and land cover transformations observed in Mt. Matese area during the period 1990–2010. In the analysis, 34 elements (cities), 28 pressure factors (driver) and 9 processes were considered (Table 5).

Tab 5. Concise framework of relations among territorial transformation processes, drivers, and the most affected municipalities inside the Matese area.

Main axes	Transformation processes	Drivers	Towns
1	INT, DET, AC	DIN_P2, DIN_P3, DIN_A4, DIN_L1, DIN_L2, DIN_L4, DIN_L8 DIN_AG2, DIN_AG4 DIN_M2	Alife, Bojano, Cercepiccola, Cerreto Sannita, Colle d'Anchise, Faicchio, Gallo Matese, San Gregorio Matese, San Massimo, Santa Maria del Molise, Roccamandolfi
	NAT, EXT, DUR, NC	DIN_P1, DIN_P4, DIN_P5, DIN_P6 DIN_AG3 DIN_M3 DIN_T1	Ailano, Capriati a Volturno, Castello del Matese, Castelpetroso, Cusano Mutri, Pietraroja, Prata Sannita, San Giuliano del Sannio, San Polo Matese, San Potito Sannitico
2 – 3	URB	DIN_A1, DIN_A2, DIN_A3 DIN_L3 DIN_M1 DIN_AG5	Campochiaro, Castello del Matese, Letino

INT= Intensification; DET=Deterioration; AC= Agricultural Persistence; NAT= Naturalisation; EXT= Extensification; DUR= Deurbanisation; NC= Natural Persistence; URB= Urbanisation;
DIN= drivers refers to the name of variables reported in Tables 1–2. DIN_ is followed by the name of the indicators reported in Tables 1–2. The red coloured municipalities are located in Molise region, the black coloured municipalities are located in Campania region.

All elements, pressure factors and transformation processes were reduced to a set of 8 axes – or major components – with a decreasing percentage of variance explained by each axis. The cumulative variance of the first three components explains about ¾ of the overall observed variability. Figures 6 and 7 show the values of the first and second axes, and of the first and third axes, which respectively summarise 65% and 60% of the total variance.

The first axis (Table 5), which explains half of the total variability, shows two opposed groups of territorial transformation processes: a) processes consuming natural resources, such as intensive agricultural practices (INT) and, to a lesser extent, transformation from natural to agricultural surfaces (deterioration, DET) or the permanence of agricultural areas (AC); b) processes that preserve natural resources, such as extensive agricultural land use (EXT), natural transformation of agricultural areas (NAT) and urban areas (DUR), or persistence of natural areas (NC). The main pressure drivers are related to the growth of farms with permanent crops (DIN_AG5) – originated by the transformation from arable crops – and the dynamics of livestock holdings (DIN_AG2). Other pressure drivers have been the urban expansion (DIN_P2) and the percentage increase in newly built housing (DIN_A4) mainly occupied by families with minors (DIN_P4). The increase in the agricultural employment rate (DIN_L4) is associated with an increase in youth and female unemployment rates (DIN_L1, DIN_L2) and low skilled workforce (DIN_L8): these links are due to the fact that in these municipalities agricultural activities represent the main source of employment, versus the unemployment of the most vulnerable segments of the active population. Finally, the loss of natural land is linked to the relative growth of private mobility (DIN_M2) and may be due to the construction of new roads to facilitate connections between the municipalities of this area and major urban centres outside the study area.

The second group of processes has characterised Mt. Matese areas in the Campania region more than those in the Molise region (as evidenced by the list of municipalities reported in Table 5). These areas have undergone a more intense ageing process (DIN_P4), but also a faster population growth (or lower depopulation, DIN_P1) due to the rise of foreign residents

(DIN_P5). The dynamics of the higher education rate (DIN_P6) and the increase in tourism facilities (DIN_T1) are interesting phenomena to be explored to assess whether new employment opportunities might have been encouraged by the tourist attraction of Mt. Matese Regional Park. Finally, in some municipalities, the number of farms with arable crops (DIN_AG3) and the long-distance mobility road infrastructure (DIN_M3) have grown.

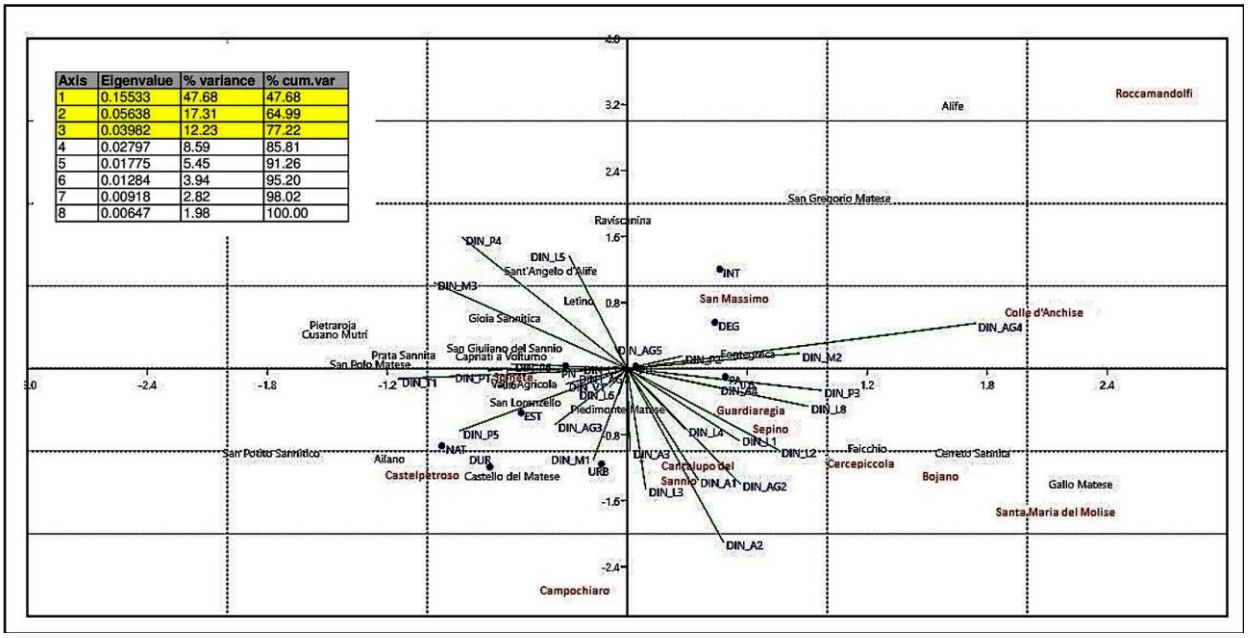

Fig 6. Relations among municipalities (in italics), drivers (in uppercase) and land change processes (with a bullet point) over CCA 1 and CCA 2.

The red coloured municipalities are located in Molise region, the black coloured municipalities are located in Campania region.
The table inserted in the figure reports the results of the CCA. It shows the percentage of the variance explained by each axis and highlights the cumulative variance of the first three axis.

If we consider the second and third axes (Figure 7), we see that there is an urbanisation phenomenon (URB), although it is rather limited in the study area (in fact, the urban persistence phenomenon, PU, is not significantly associated with any variable) and affects a limited number of municipalities. These municipalities are interested both by the presence of second houses (DIN_A1), and by phenomena of abandonment and obsolescence of dwellings (DIN_A2, DIN_A3). In these municipalities, a high employment turnover index (DIN_L3) is observed, due to the migration of young people, along with commuting for study reasons or work-related phenomena (DIN_M1).

Finally, a summary of the main results emerging from the analysis shows two main elements: land cover changes have affected only a small part of the study area; major land cover changes were due to conversions between agricultural land uses.

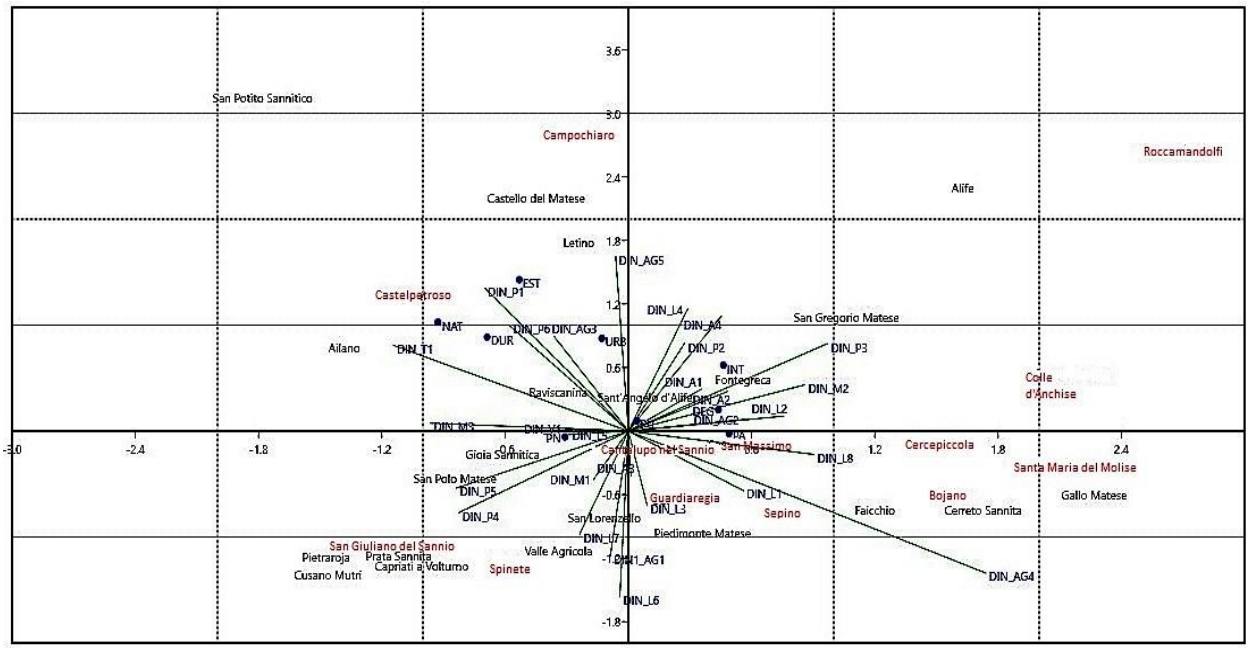

Fig 7. Relations among municipalities (in italics), drivers (in uppercase) and land change processes (with a bullet point) over CCA 1 and CCA 3.

The red coloured municipalities are located in Molise region, the black coloured municipalities are located in Campania region.

5. Discussions and conclusions

In Italy, the evolution of rural areas was not homogeneous. Transformations were substantially different from place to place and led to a variety of situations, some of which were situations of real development and progress, whereas others just produced disadvantage and marginalisation. This paper analysed a rural inner area in central Italy, Mt. Matese, with the aim of showing how the characteristics and dynamics of some socio-economic drivers led to land cover changes. The results of the study can help us understand how this specific area developed and can help us make assumptions about its future trends.

The characteristics and dynamics observed in the study area are in line with what was described in a recent European Regional Report (European Commission, 2016). The report illustrates the disparities existing in Italy, where northern areas enjoy a better situation than southern ones, and places the Country in an extremely critical position for some socio-demographic and economic phenomena, such as ageing, depopulation, unemployment especially youth unemployment, and scarce opportunities offered by the labour market. These phenomena are reported as being more frequent in rural and inland areas of the country; therefore, the results of our study on Mt. Matese area are in line with the trend observed at national level.

Land cover changes affected only a small part of Mt. Matese area. The major changes were due to the conversion between agricultural uses (from extensive to intensive use), while urban development phenomena were limited to specific localities outside protected areas. In addition to the intensification of agricultural practices, another driver of increased land consumption has been the expansion of the secondary road network to meet the commuting needs of local people who have to reach main urban centres outside Mt. Matese area.

The low pace of land use changes observed so far in the study area and its low population density could favour the preservation of its natural heritage. As pointed out in the literature, human settlements can damage the ecological network, which, on the contrary, is well preserved in the presence of land cover persistence and low population density (Brunori et al., 2016).

The study area was affected by a declining process linked primarily to depopulation phenomena, caused by demographic decline and ageing. Urban settlements have a very small

size, and the incidence of scattered settlements is high. Furthermore, the proportion of unoccupied dwellings is high and the rate of new buildings is low. In this regard, possible future developments of the study area should consider the net land issue (Zoppi and Lai, 2015). In 2011, the European Commission (EC) proposed the objective of no net land take by 2050 and urged to include it in the objectives of the European Structural Funds for the 2014–2020 programming period (EC Communication to the European Parliament COM (2011) 571 of 20 September 2011). In relation to this objective, and considering the high potential of unoccupied dwellings in Mt. Matese area, possible demographic developments could be supported by residential opportunities in the area and comply with the no land take objective.

However, the case study considers that neither the difficult demographic situation nor the remoteness of the area constitute by themselves the main determinants of land cover changes and poor local development. Moreover, the demographic situation is the cause, but also the effect of other determinants. Socio-economic determinants are important drivers of land cover changes and local development.

In the study area, although the land has not undergone significant changes, development is conditioned by a labour market with limited employment and income opportunities for the local population, especially young people and women, lack of qualified job opportunities, and an increase in unemployment. The slow changes in land use are counter-balanced by relatively rapid dynamics of socio-economic drivers. These dynamics must be carefully considered for a two-fold reason: first, their effects on land cover and on the local environment may become manifest in the long term and be characterised by uncertainty, as to their time of occurrence, their trend and intensity; secondly, the socio-economic decline of the area could reach a critical threshold beyond which no future development could be achieved.

In the study area, agriculture suffers from a situation of marginalisation. The agricultural production system is extremely fragmented. Over the last twenty years, a significant decline has occurred in the number of farms and in cultivated areas. These phenomena are in line with the trend observed at national level in recent ISTAT Agricultural Censuses (Spinelli and Fanfani, 2012). Marginal conditions are particularly critical in mountain areas, where farm holdings still retain many of the features associated with traditional and backward farming: small business size, low technological level, and senescence of agricultural entrepreneurs (Salvioni et al., 2013). On the other hand, in traditional contexts, farms and livestock holdings may adopt circular approaches that, while respecting the environment (Palmieri et al., 2017a, 2017b), could enhance local food traditions and quality and guarantee economic returns. Moreover, the Molise area could respond to the growing demand for return to rural life as a reaction to globalisation processes (van der Ploeg et al., 2008).

Unlike the agricultural sector, tourism in Mt. Matese area has shown signs of dynamism: businesses and therefore tourist offerings have increased. Tourism activities can provide a solution to the development problems of mountain areas. In particular, farm tourism activities, in which tourism has a complementary role and integrates farming activities, allow a diversification of income sources and constitute an alternative source of employment. Farm and rural tourism activities can produce positive effects on the environment; they could help protect the landscape and maintain biodiversity, as well as valorise local food and quality productions (Giaccio and Mastronardi 2011; Mastronardi et al., 2015). The different types of rural tourism are key factors for local development, especially in areas with a rich environmental and cultural heritage, increasingly appreciated by tourists. The various forms of tourist settlements in rural areas (farmhouses, rural tourisms, scattered hotels) can also help recover abandoned rural buildings (De Montis et al., 2015) without requiring additional land use for the construction of new ones. In this way, these forms of tourist accommodation minimize the impact on land consumption and changes in the landscape (Cano et al. 2013, Cascone and Porto, 2008). In the study area, especially in view of the possible creation of a National Park, sustainable forms of tourism can support local development, increase environmental awareness, preserve and enhance natural resources, and minimize the land take.

Sustainability must therefore be the key priority, and past land conservation and management policies must be revised accordingly, so that what has remained unchanged over time could be

preserved, and a responsible use of local resources could be promoted. Goals, resources and activities of rural areas must be included in measures and actions for planning a sustainable rural development.

In Italy, past rural development policies had a strong sectoral connotation. The suggested approach now seems to be integrated and multi-sectoral; it considers the local system as a whole and has a bottom-up perspective. In this respect, the EU rural development policy for 2014–2020, in line with the objectives of Europe 2020 and the Common Agricultural Policy, has defined a long-term strategy based on three objectives: enhancing the competitiveness of agriculture; preserving the sustainable management of natural resources and climate action; promoting a balanced development of rural areas.

In implementing this strategy, the European Structural Funds (2014–2020) consider the specificity of mountain areas, but the Rural Development Plan (RDP) of the Molise Region does not include specific measures for the development of mountain areas in the region. However, since Mt. Matese is a pilot project under the National Strategy for Inner Areas (UVAL, 2014), it will receive strategic and financial support from the central state administration. In other words, thanks to its recognition as an inner area, Mt. Matese will receive interventions and resources for its sustainable development. The pilot project for Mt. Matese development shall revive a socio-economic system that in some parts no longer exists, and in other parts is weak. However, the study area shows all the necessary conditions to safeguard changes in land use, revitalise the weak demographic framework and support a sustainable local development based on a variety of small-scale businesses. Tourism is an important lever to attract visitors driven by an interest in the natural and cultural heritage; small crafts and traditional farming are part of this vision, as they preserve local resources and quality productions.

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