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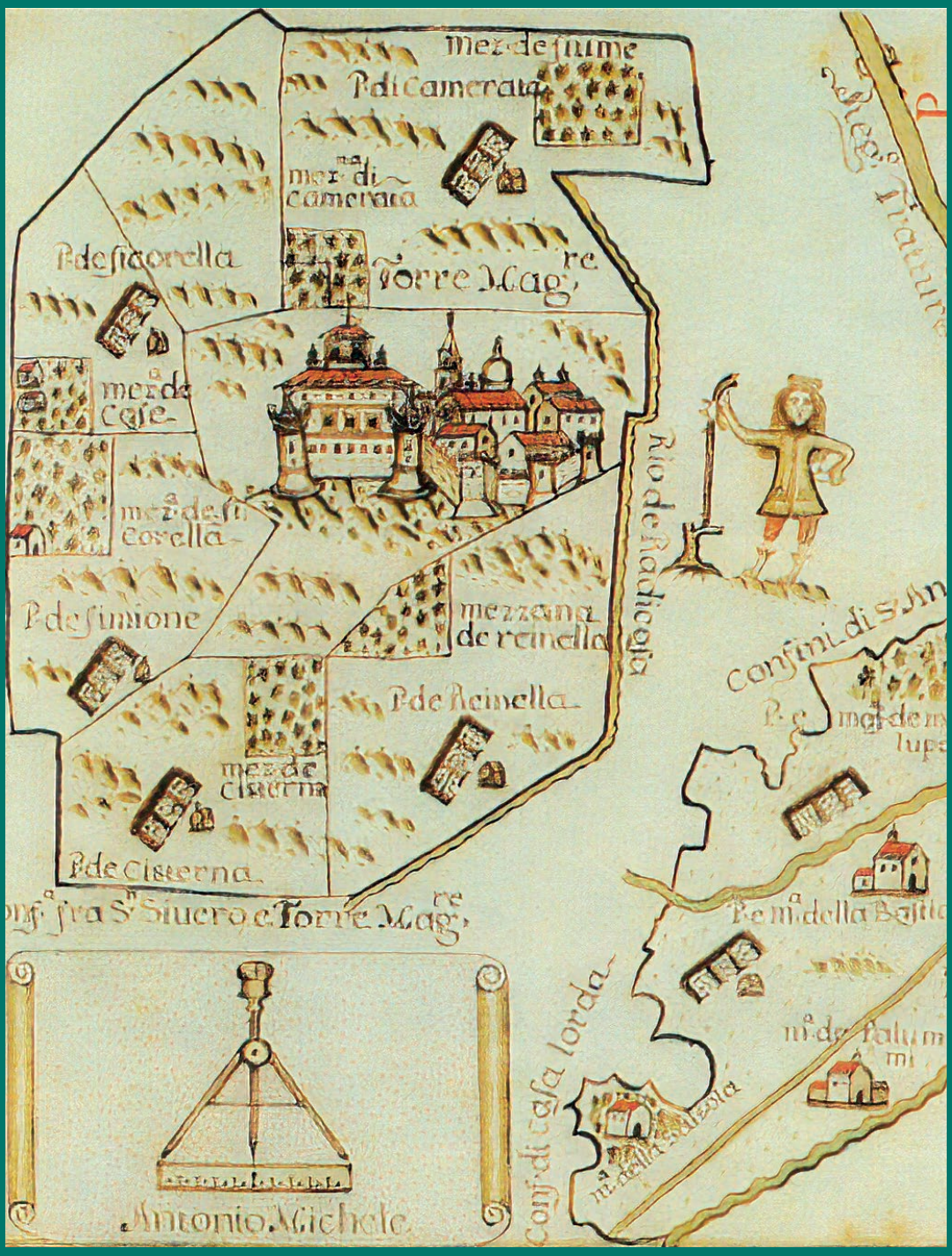

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ORCID:
PC: 0009-0003-7013-7192

A zoning of the Metropolitan City of Naples and analysis of land values

Paolo Cupo[1,*], Erasmo Dell'Isola[2]

[1] *Department of Agricultural Sciences, University of Naples Federico II, Italy*
[2] *Agronomist*
E-mail: paocupo@unina.it, dellisola.erasmo@gmail.com
*Corresponding author

Abstract. This paper presents the results of a zoning study involving the metropolitan city of Naples, for the purpose of identifying the areas within which to perform a comparable search by applying the synthetic-comparative market value procedure of appraisal. Moreover, an analysis was carried out of the values of agricultural land reported by two official sources, i.e. average land values (VFM) and average agricultural values (VAM), and by an unofficial source, i.e. the values of the Observatory of Agricultural Values (VAO). The results show that for some area/crop quality combinations, the values recorded can provide a significant indication of the agricultural value to be estimated. Vice versa, for estimating the agricultural value of land cultivated with the most profitable crops, the official values showed to be unreliable, meaning that the appraisal requires an accurate field survey. As for the differences between the different homogeneous areas, VAO prove to be more reliable, while VAM are the least significant values.

Keywords: zoning, comparable, agricultural value, market value.
JEL codes: C18, Q15, R32.

1. INTRODUCTION

The appraisal judgment is based on the comparative method for which the value is assigned to the assets to be evaluated by comparing them with similar assets of known price. To this end, there are various 'technical' methodologies applied in the estimation procedures which translate the appraised value into monetary terms. The choice of the most appropriate procedure to apply in each case strictly depends on the availability of elementary data. In particular, the synthetic-comparative procedure consists in the evaluation of an agricultural land (subject) by comparing it with similar properties (comparables) for intrinsic conditions, i.e., specific to the subject, and extrinsic, i.e. not inherent to it but influencing the values of all lands located in the same area. This approach is based on Jevons' law of indifference (1871), according to which if the comparison between identical assets is made in

the same market and at the same time, they must have the same value. For these similar assets, it is necessary to ascertain the market prices resulting from the appreciation assigned to the similar features of the subject by economic operators during the exchange. The comparison is made between 'similar' rather than 'identical' properties, in consideration of the probable uniqueness of agricultural land characteristics based on which, for at least one common attribute (technical parameter), the properties differ from each other. In this regard, the spatial context in which the subject is inserted cannot allow differences in the extrinsic characteristics influencing either the subject or comparables. Practically speaking, there are two crucial variables that enable the value of the subject to be estimated on the basis of the prices of the comparables; these are space and time. With regard to the spatial variable, "*the comparative principle would be correctly applicable only on condition that the sample of observed assets for comparison is made up of observations that have the characteristic of being homogeneous from a spatial point of view. This is in the belief, verifiable in real situations, that a different space generates an equally different appreciation by economic operators*" (Grillenzoni and Grittani, 1994, pp. 40-41). Despite its relevance, "*for the purpose of identifying the space within which to conduct the investigations ... it is not possible to provide precise indications .... That of spatial homogeneity is one of the appraisal problems that remains unsolved: the space can be defined thanks to the experience and sensitivity of the appraiser*" (Grillenzoni and Grittani, 1994, p. 41). On this same point, Medici stresses that "*the prices collected should refer to a fairly uniform area so as to make comparison easier and less arbitrary; in any case, the size of the market is a matter of such uncertainty that it cannot be usefully discussed: it generally covers the appraiser's normal field of activity*" (Medici, 1955, pp. 120-121). On the other hand, the character of 'immobility' of an agricultural land gives the space absolute importance, to the point that location is often considered the most important determinant of the market value in the real estate sector (Hoesli and Morri, 2010), such that two lands with the same intrinsic features may be valued differently. The localization zones, in fact, may differ according to the different land productivity and/or the different intensity of the demand for land, also due to operator expectations concerning land use changes.

The area within which to search for comparables represents, therefore, one of the operative choices that are not easy to resolve. From this point of view, especially in complex and far from homogeneous territorial contexts such as the Metropolitan City of Naples, there is an unavoidable trade-off between the number and quality of the available observations for a reliable appraisal judgment. In fact, while the goal of assigning the maximum possible credibility to an appraisal value is guaranteed, among other things, by the reliability of the elementary data[1], the restriction of the geographical perimeter inevitably implies the reduction, even to zero, of the comparables, in consideration of the well-known low activity of the agricultural land market.

Therefore, if, on one hand, the importance of the spatial variable is emphasised, on the other hand, in literature this problem constitutes one of the aspects of the appraisal procedures that are substantially unresolved, leaving the choice to the assessor's skill and experience, with few exceptions, such as the municipal borders (Romano, 2007) or "*each province within the same agrarian region*" (Gallerani, 2011, p. 31). And this applies to other 'market-oriented' procedures, such as the market comparison approach (MCA) which, based on professional experience, seeks to overcome empirical appreciation by adjusting the average price of comparables, in order to "*take into account the residual dissimilarity of the property to be estimated with the comparable properties*" (Simonotti, 2006, p. 178). Residual dissimilarity, however, can only concern subject features that are different from the parameter considered in the comparison, leaving it to the sensitivity of the appraiser to choose the space within which to search for comparables.

In short, while, on the one hand, Italian literature underlines the importance of the spatial variable, on the other hand it provides general suggestions about where to find the comparables. These suggestions basically fall within two categories: a) by using existing zonings as the agrarian regions or the municipal boundaries; b) by leaving the choice to appraiser. This could be the reason why, to our knowledge, there is no research on the zoning of metropolitan areas – including that of Naples – aimed at the first purpose of this study. Given their heterogeneity, in fact, for the purposes of appraisal the zoning of such areas would be necessary. In international literature some examples of zoning can be found, but they focus on very extensive territories such as the State of Maranhao in Brazil for the determination and forecast of agricultural land prices (Reyton et al. 2014). On the other hand, the literature is rich in research demonstrating the significant influence of territorial and urbanization features on agricultural land prices and the crucial importance of location also in terms of distance from the city (Borchers et al., 2014; Buurman, 2001; Cavailhès and Wavresky, 2003; Delbecq et al., 2014; De

[1] The elementary data include the market prices of lands similar to the subject, since it involves factual data that can be used "*without resulting from the application of calculation procedures*" (Di Cocco, 1960, p. 17).

Noni et al., 2019; Guiling et al., 2009; Kuethe et al., 2011; Sklenicka et al., 2013; Vyn & Shang, 2021).

Therefore, one of the objectives of this study is to adapt the spatial variable for appraising the market value of agricultural land to a highly heterogeneous context such as the Metropolitan City of Naples. It follows that the first research question is: where to look for comparables in the Neapolitan metropolitan area?

Secondly, the research also aims to analyse the currently available values of agricultural lands recorded at municipal and zonal level by secondary sources – one unofficial, which provides minimum and maximum values for the same crop quality, and two officials, as will be more fully illustrated in the following pages[2]. Some of these values are frequently (and sometimes uncritically) adopted in a professional context to accompany the appraisal of the market value of agricultural land, although they are not calculated to this end[3], independently of the territorial context and/or crop quality. While there are studies that analyse various aspects of the land market by using some of these values (Casini et al. 2015; Di Fazio, 1990), to our knowledge there are no comparative analyses of these three values that refer precisely to crop quality within homogeneous zones in a specific metropolitan area. For this reason, it may be useful to study closely the characteristics of these values by comparing them within the different territorial and cultivation contexts of the Neapolitan metropolitan area. The aim of this second research, therefore, is to attempt to answer the following questions: *a*) What characteristics do the agricultural values of the three sources have with reference to the identified zones and crop qualities?; *b*) For which zone/crop quality combinations are the agricultural values of the three sources most convergent? *c*) Which source is most reliable in supporting the market value appraisal of agricultural lands? *d*) Is the importance of field expertise, and hence the necessity of gathering data from primary sources on the availability of which the choice of appraisal procedure depends, the same or not in the correspondence between the different agricultural values of land?

This study, therefore, which focuses on the sales comparison approach, aims to give insights about two operative choices of rural appraisal: 1) *where* to search for truly market comparable or sales data, which must be near enough in spatial (as well as in temporal) terms to reflect the same market conditions of the subject, and 2) *which* useful information can be drawn from the secondary sources in providing data for defining the mercantile framework of the agricultural lands to be appraised.

To answer the four research questions the study is organised as follows. The second section describes the fundamental aspects of the Neapolitan Metropolitan City territory. The third section illustrates the zoning and the relative applied methodology, and the fourth section details the data, the methodological approach and the results of the land values analysis. Section 5 shows the main remarks and discussions, and Section 6 draws the conclusions.

2. THE STUDY AREA

The territory of the Metropolitan City of Naples comprises the entire province of the regional capital, including 92 municipalities. This area, despite being of limited extension (1,171.16 km^2, corresponding to 9% of the territorial surface of the Campania region), presents striking characteristics of internal differentiation, so much so that it is defined among the Italian metropolitan areas as "*one of the most complex, dense and problematic*" (DARA, 2017, p. 12). These differences are the result of the joint action between the natural system, with the specific characteristics it assumes in the individual areas, and the anthropic adaptation of the soil for housing and for industrial, artisanal, tertiary, tourism, and infrastructural uses.

The process of urbanization, which at the time of the unification of Italy was centralized in the city of Naples, has over the decades gradually taken on a more widespread aspect, with the consequent fragmentation and pulverization of landed property, giving rise to 'interstitial' agricultural forms with an incoherent succession of houses and small plots. These dynamics have thus been translated into quantitative terms: while in 1970 the percentage of land area used by agriculture (UAA) was 56.9%, forty years later, in 2010, this percentage had dropped to 19.6%, corresponding to a consumption of approximately 44,000 hectares of soil (-65.6%). It should also be emphasized that the pace of this process has taken on increasingly pressing connotations, so much so that the average annual rate of reduction of UAA has risen from 2.2% in the three decades 1970-2000 to 4.2% in the last intercensal decade 2000-2010. These dynamics resulted in the metropolitan area of Naples holding a UAA percentage of the territorial surface of around 20% compared, for example, to 46% and 41% in Bologna and Milan respectively (Branduini et

[2] A source is 'official' when it presents values prescribed by legislation, while it is 'unofficial' when the real estate values are the result of investigations carried out by public or private institutions (Tempesta, 2018).

[3] It is not uncommon that, for land allocated exclusively for agricultural purposes, 'agricultural' value and 'market' value are used interchangeably.

al., 2016), with inevitable repercussions on land values. It should be pointed out, moreover, that this impressive soil consumption is partly the consequence of an interpretation of agricultural areas as land that is perpetually waiting to be used for construction, rather than as areas suitable for agricultural use, which should be the purpose for which their status as non-development land is established in the first place. This interpretation has also been favoured by certain jurisprudential rulings[4] which have denied the causal link between agricultural green and agricultural activity (Cupo, 1992).

This process has had an even greater impact on agricultural performance, especially considering that from an agronomic point of view a large part of the territory benefits from high land fertility, due to the significant presence of organic substances and to the pedogenetic processes of volcanic soils with their rich chemical, physical and biological properties. This favourable natural condition allows the lands to achieve high levels of productivity and, consequently, high levels of income per unit of UAA. Consider, in fact, that the standard production per hectare of UAA in this territory is € 14,252.35, the highest of all the provinces in the region. In the other provinces of Campania to achieve this level it takes an average of 5.45 hectares in Avellino, 4.07 in Benevento, 3.71 in Salerno and 2.35 in Caserta (ISTAT, 2013).

At present, the total agricultural area (TAA) of the Metropolitan City of Naples is 26,091.9 ha, representing 22.1% of the total, while UAA is 23,088.8 ha, corresponding, as already mentioned, to 19.6% of the total. 37.2% of UAA is used for arable land, with a clear prevalence of vegetables, flowers and ornamental plants (45.7%); 62.8% for woody crops, mainly fruit-bearing (70.8%), especially hazelnut, peach, apricot, walnut and plum trees, followed by olive trees (12.3%), vineyards (11.4%) and citrus fruits (4.8%); 0.008% for family gardens and 0.02% for permanent meadows and pastures. The 9,973 farms represent 3.5% of the total metropolitan area and are essentially based on the workforce provided by the farmers and their family members (Unioncamere Campania, 2016). Overall, agriculture accounts for 5.1% of total employment in the area, while its contribution to total economic wealth stands at 1% (C.C.I.A.A. Napoli, 2018).

The orography of the territory, together with the progressive urbanization, has determined the appearance of a variety of agricultural landscapes, which include the terraced landscapes of the Sorrento peninsula, the anthropic ridges of the Phlegraean Fields, the orchards of the Vesuvius area which are replaced by forest crops at higher altitudes, plots cultivated intensively with horticultural crops in the open field and in protected environments in the eastern suburban fringe of Naples.

This plurality of territorial conditions demands the delimitation of relatively narrow areas within which to search for comparables, in contrast with the possibility of expanding the space – due to the presence of road infrastructures and adequate means of transport that minimise the importance of the distance between the agricultural areas (Grillenzoni and Grittani, 1994) – with localization being still a main factor in determining the prices of agricultural lands in this territory.

3. THE ZONING

3.1 The methodological approach

The land market is local and must therefore be broken down into a series of sub-markets in order to account for spatial heterogeneity, since locational factors and price levels even for the adjacent lands vary depending on their surrounding conditions and the physical conditions of the individual lands. Therefore, given that both agricultural and non-agricultural factors are influential determinants of agricultural land prices (Mela et al., 2016), the goal of zoning in applying the sales comparison procedures should be to identify areas with similar extrinsic features which, together with similar intrinsic characteristics of the land, form similar values for similar lands. In this perspective, the approach followed, taking the municipality as minimum unit, has imposed the contiguity constraint based on the most probable existence of similar territorial features between contiguous municipalities. This choice is feasible if we consider the possible spatial dependence of agricultural land prices on neighbouring prices for similar lands (De Noni et al., 2019; Feichtinger and Salhofer, 2013; Maddison, 2009; Marques and Telles, 2023; Patton and McErlean, 2003), as well as the existence of a higher number of alternative uses other than agricultural for lands in areas with a greater density of economic activity in the surrounding territory (Cavailhès and Wavresky, 2003). Theoretically, this would be possible by resorting to cluster procedures, imposing the constraint of the territorial contiguity of the component units in each cluster, but this would require the availability of a series of variables and indicators capable of measuring individual phenomena at municipal level. Instead, a different path was chosen, which indirectly uses this information, as

[4] Regard this, the ruling of the Council of State, Section IV, 11-6-1990 no. 464 establishes that "*the use of agricultural green areas does not presuppose the agricultural allocation of the area, as it may well be designated for achieving a better balance between built-up and non-built-up areas*".

it is based on six zonings of the study area which can translate into territorial terms the influences of non-agricultural factors on the market values of land, including land intended exclusively for agricultural purposes.

Therefore, in order to use the existing zonings of the study area most relevant to this purpose, a cross-set operation was necessary. In particular, a generic homogeneous area A_i of the final territorialization is the set formed by the intersection – denoted by symbol ∩) – of the six original zonings, such that it includes the municipalities c which are in zone i of the first zoning ($A_i^{Z_1}$), zone i of the second zoning ($A_i^{Z_2}$), zone i of the third zoning ($A_i^{Z_3}$), and so on. Therefore, by indicating with symbol ∧ the 'conjunction' as logical connective, formally we have:

$$A_i{:}Z_1 \cap Z_2 \cap Z_3 \cap Z_4 \cap Z_5 \cap Z_6 = \{c | c \in A_i^{Z_1} \wedge c \in A_i^{Z_2} \wedge c \in A_i^{Z_3} \wedge c \in A_i^{Z_4} \wedge c \in A_i^{Z_5} \wedge c \in A_i^{Z_6}\} \quad [1]$$

3.2 The zonings of the Metropolitan City of Naples

3.2.1 The agrarian regions

The agrarian regions represent territorial areas that derive from the subdivision into smaller districts of the altimetric areas previously delimited by ISTAT. Their territory is made up of contiguous municipalities that present similar natural conditions, in terms of geology, climate, position, relief, etc., and agrarian conditions, i.e., from the point of view of existing or potential crops. The analogy of these conditions has likely led some authors to consider them for the purposes of comparison, albeit as a general rule, in order to identify similar lands within the agrarian region (Gallerani, 2011). However, as appropriately specified by ISTAT, "*the analogy of the conditions must be understood in a broad sense, bearing in mind that the Italian municipalities (...) present, within their own constituency, a variety of positions and other characteristics*" (ISTAT, 1958, p. 10).

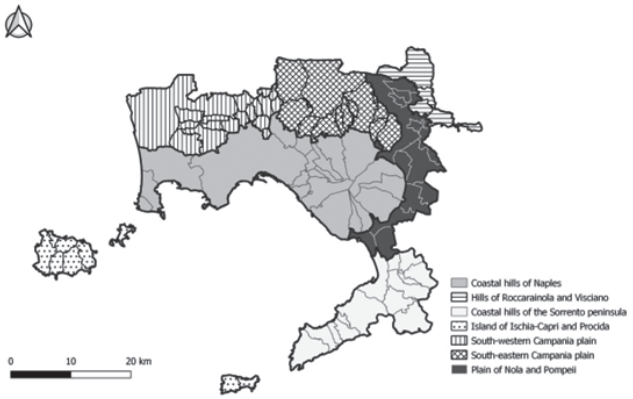


Figure 1. The agrarian regions.

The division made by ISTAT resulted in a delimitation of the national territory into 770 agrarian regions, seven of which concern the metropolitan area of Naples (Figure 1). Of these, three fall within the altimetric area of the plain (south-western Campania plain, south-eastern Campania plain, plain of Nola and Pompeii) and four in the hill area (the coastal hills of Naples, the Roccarainola and Visciano hills, the coastal hills of the Sorrento peninsula, and the islands of Ischia, Capri and Procida).

3.2.2 The homogeneous areas according to Law no. 590/1965

Law no. 590/1965, "*Provisions for the development of agricultural property*", established the granting of mortgages with a duration of 40 years to direct farmers and other manual workers of the land at an annual rate of 1%, to purchase land "*suitable for establishing farms with suitable characteristics or predisposition for building efficient family businesses, from a technical and economic point of view*" (art. 1). The loan is granted up to the full amount "*of the purchase price of the land deemed appropriate by the provincial agricultural inspectorate*" (art. 3). To this end, art. 4 specifies that a "*provincial commission periodically indicates, with reference to areas with homogeneous or similar agronomic characteristics, the average land values referring to units of surfaces and types of crop*". The principle of equity, provided for in art. 3, must be based on the above values and "*in relation to the specific structural and production elements that make up the individual land*". It is clear, therefore, that this zoning has an explicit estimative purpose, although the land market segmentation that it implies is dictated by the analogy of agronomic or similar characteristics, leaving out other aspects which, having a greater impact on market values than on 'agricultural' values, make the purchase price of the land suitable as long as it is in line with an estimated average land value based exclusively on the agricultural allocation aimed directly at establishing efficient family businesses[5].

Specifically, in the territory of the Metropolitan City of Naples, the provincial commission has identified 12 homogeneous zones, as illustrated in Figure 2.

[5] Every year the official bulletin of Regione Campania publishes the updated VFM, as requested by the management operating unit "Competitiveness and agri-food chains", to the management operating units of the General Directorate for Agricultural, Food and Forestry Policies competent for the territory.

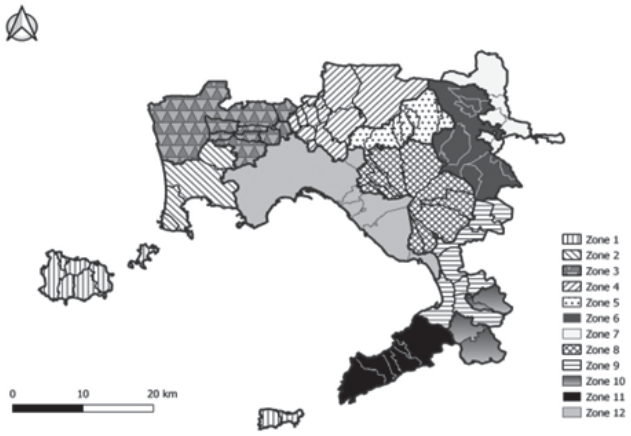


Figure 2. The homogeneous areas according to Law n. 590/1965.

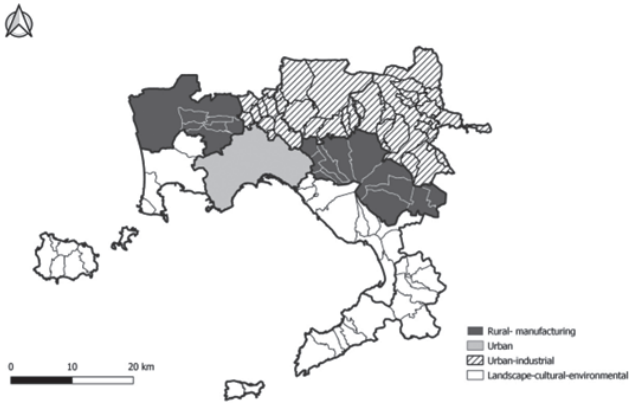


Figure 3. The territorial systems of development.

3.2.3 The territorial systems of development

The Regional Territorial Plan (RTP) is a planning tool in which the regional legislator, allowing for the needs of the individual territories, directs, coordinates and guides the planning activity of the local authorities (Michieli and Cipollotti, 2018).

Campania's RTP was approved by Regional Law no. 13/2008 for guaranteeing the uniformity of the provincial territorial planning tools, in the implementation of Regional Law no. 16/2004, entitled "*Regulations on the management of the territory*". Through the RTP, the Regional Council, following sections 2 a and c of article 13 of Regional Law no.16/2004 and "*in compliance with the general objectives of promoting sustainable development and to protect the physical integrity and cultural identity of the territory*" identifies "*the basic objectives and the main lines of organization of the regional territory, the strategies and the actions aimed at their realization*", as well as "*the guidelines and criteria for the development of provincial territorial planning tools and for institutional cooperation*" (Regione Campania 2008).

In consideration of this, RTP identified 45 Territorial Development Systems (TDS), i.e. areas considered homogeneous based on the geographical characteristics declared by the local social entities themselves and for self-organized local development strategies. These systems are classified according to territorial dominants and constitute zones with respect to which territorial planning assumes homogeneous territorial references, limiting the excessive proliferation of areas.

The TDS that apply to the territory of the Metropolitan City of Naples and, on an urban level, to the municipality of Naples, are characterized by the dominants "*rural-manufacturing*", "*urban-industrial*" and "*environmental-cultural-landscaped*" (Figure 3). The dominants are represented by the characteristics and vocations of the territories for which the identified areas are homogeneous for social and geographical characteristics and for pursuing the local development strategy. Practically speaking, this zoning is based on demographic characteristics and the existing socio-economic and geographical assets.

In consideration of the criteria used, this zoning can certainly affect the segmentation of the land market and as such contribute to the purpose of the study.

3.2.4 The rural territorial systems

Another territorialization involving the metropolitan area of Naples is made by Regione Campania which, to describe the various regional "agricultures", has identified 28 Rural Territorial Systems (RTSs), 7 of which exclusively or partially involve the study area (Figure 4).

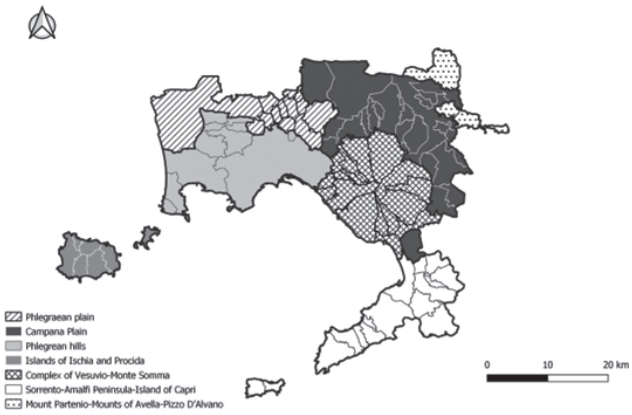


Figure 4. The rural territorial systems.

The RTSs were delimited by aggregating the municipalities considered to be reasonably homogeneous (Regione Campania, 2013), in terms of:

- physiographic and pedological characteristics conditioning the production potential;
- main agricultural and forestry uses;
- forms and structures of the agricultural landscape;
- relations with the urban and infrastructural system.

Given the characteristics based on which the territory has been divided, it is quite clear how the various spatial contexts identified in turn define the different land markets, especially taking into account the value deriving from the exclusively agricultural merit of the land. This zoning, therefore, makes a significant contribution to the goal of delimiting homogeneous territorial areas in which to look for comparables for appraising agricultural lands.

3.2.5 The zones of the Campania Rural Development Plan 2014-2020

The territorial analysis units of the Campania RDP 2014-2020 are represented by aggregates of homogeneous municipalities by altitude range, considering the relationship between the total agroforestry area and the territorial area, as well as the population density (Regione Campania 2015). In the territory of the Metropolitan City of Naples, in consideration of the high resident population density, there are three of the four identified macro areas (Figure 5). These are the "*urban and peri-urban*" macro-area, including the municipality of Naples; the "*rural area with intensive agriculture*", which aggregates the municipalities located in the plains in which the rural area exceeds 2/3 of the total, and the "*intermediate rural*" macro-area, which includes the rural hill towns with the highest population density and characterized by an intermediate development.

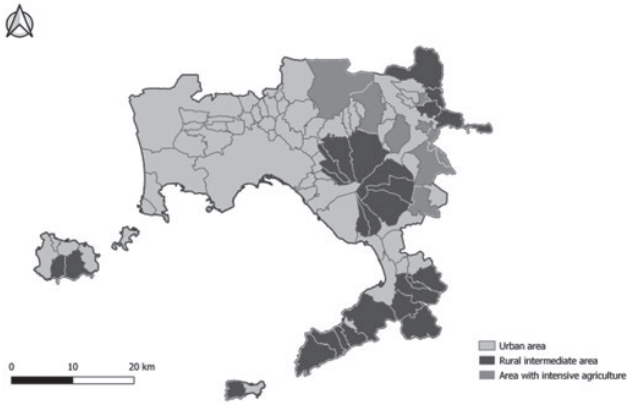


Figure 5. The zones of the Campania Rural Development Plan 2014-2020.

Although this zoning is the result of using indicators identified for rural development policy purposes, it can undoubtedly represent a basis for delimiting the various land market segments, also because of the importance given to the anthropic pressure and corresponding growing demand for land. As it has been observed, in fact, "*the market segmentation depends on the demand and not on the characteristics of the asset*" (Tempesta, 2018, p. 112), with the intrinsic and extrinsic factors characterizing the agricultural lands and affecting the demand for land, which influence to varying degrees the areas identified by the RDP.

3.2.6 The homogeneous zones according to the charter of Metropolitan City of Naples

To ensure a more balanced and functional territorial structure, the charter of the Metropolitan City of Naples may call for the establishment of homogeneous areas based on the characteristics of identity and historical value; of geomorphological, naturalistic and landscape contexts, and of functional relationships and socio-economic frameworks that justify their common membership. This contingency is included in Law no. 56/2014, in which Article 1,11c reads: "*The statute may provide for (...) the establishing of homogeneous areas and specific functions, taking into account the specific territorial features…*"

The identification of homogeneous areas was carried out in compliance with the "*Guidelines for the Identification of Homogeneous Zones*" (Città Metropolitana di Napoli, 2019) which determine the identification of territorial areas with a population of at least 400 thousand inhabitants, in order to guarantee a minimum critical mass and a delimitation based on following criteria:

- contiguity and homogeneity both internally and in relation to other homogeneous areas;
- balance about geo-morphological and landscape aspects;
- optimization to the structural and socio-economic arrangement.

The study area is therefore broken down into the following five homogeneous zones: *Naples*, *Flegreo-Giuglianese*, *Nord*, *InternoVesuvio-Nolano* and *Costa Vesuvio – Sorrentino* (Figure 6). The criteria used to identify these zones, especially as regards the geo-morphological, landscape and socio-economic aspects, contribute to the definition of as many land markets. For these reasons, this territorialization has been taken into consideration in identifying the homogeneous areas, as illustrated in the following section.

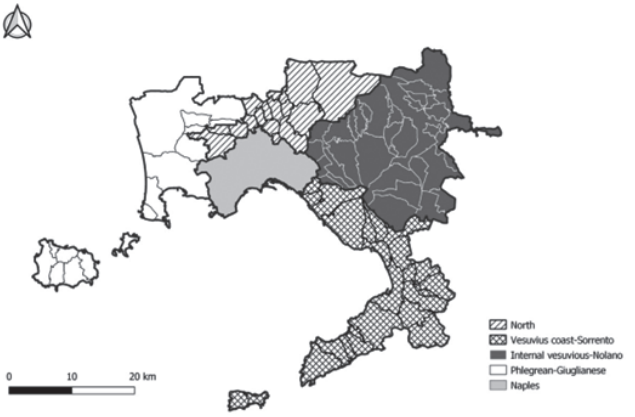


Figure 6. The homogenous zones according to the charter of Metropolitan City of Naples.

Figure 7. The identified homogeneous zones.

3.3 The identified homogeneous zones

As previously mentioned, the six zonings examined were all used for delimiting homogeneous areas in which to look for comparables, although they have not been defined for this study. Their usefulness derives from the consideration that the market values of agricultural lands are the result of the joint action of three factors represented by land productivity (and therefore profitability measured in terms of rental value[6]), demand for land and possible changing use which, depending on the areas and the related urban dynamics in place, are incorporated in the expectations of economic operators. It follows that both the territorializations that take into greater account the characteristics influencing agricultural land profitability and those defined for territorial development needs (with inevitable repercussions on the behaviour of potential buyers of land) contribute to land market segmentation.

By following the methodological approach illustrated above it was possible to identify 12 homogeneous zones, illustrated in Figure 7, while the municipalities falling within them are shown in Table 1. An examination of these reveals that, in such a heterogeneous context, the implication that the comparable lands should be found within the same agrarian region of the subject does not appear to be feasible. For instance, five homogeneous zones were identified in the agrarian region of the coastal hills of Naples, while in that of the plain of Nola, comprising fifteen municipalities, one homogeneous zone was identified (no. 12), whose territory includes only four municipalities. Given that the homogenous zones do not include all the municipalities, it follows that, if the agricultural land to be appraised falls within a territory not belonging to the areas in question, the space in which comparables may be found will necessarily be limited to the municipal area.

All zonings considered in the study show the same drawbacks as the agrarian regions, being aimed for purposes of rural development and, more generally, territorial policy, with the sole exception of the territorialization used to determine the land values following Law no. 590/65. In fact, the latter appears more in line with

Table 1. The municipalities of the identified homogenous zones.

Zone 1	Massa di Somma, Ottaviano, Pollena Trocchia, San Giuseppe Vesuviano, Sant'Anastasia, Somma Vesuviana, Terzigno
Zone 2	Cercola, San Sebastiano al Vesuvio
Zone 3	Boscotrecase, Trecase
Zone 4	Ercolano, Portici, San Giorgio a Cremano, Torre del Greco
Zone 5	Calvizzano, Marano di Napoli
Zone 6	Bacoli, Monte di Procida, Pozzuoli
Zone 7	Qualiano, Villaricca
Zone 8	Casamicciola Terme, Forio, Ischia, Lacco Ameno, Procida
Zone 9	Barano d'Ischia, Serrara Fontana
Zone 10	Casalnuovo di Napoli, Castello di Cisterna, Pomigliano d'Arco
Zone 11	Visciano, Roccarainola, Casamarciano
Zone 12	Cicciano, Cimitile, Nola, San Gennaro Vesuviano

[6] Beneficio fondiario.

the achieved zoning, consistently with the typically estimative purpose for which this zoning was established. Despite this, since all the other five zonings represent the result of territorial investigations that include aspects which, to some extent, contribute to segmenting the land market of the study area, they have proved to be useful and functional to the delimitation of the 12 identified homogeneous areas.

4. AN ANALYSIS OF LAND VALUES OF SECONDARY SOURCES

4.1 Data and methodological approach

After the zoning, the second goal was to analyse the land values determined by three secondary sources. The two official sources are the Average Land Values (VFM), as detailed above, established by law no. 590/1965, and the Average Agricultural Values (VAM) introduced by Law no. 865/1971 (so-called "House Law"), as an indemnity criterion in the event of expropriation for public utility. The unofficial source is the database of real estate prices (VAO) of the Agricultural Real Estate Market Observatory (OVA), established following the declaration of unconstitutionality of VAM as a result of Constitutional Court ruling no. 181/2011[7].

Preliminary to the analysis is the selection of the crop qualities whose relative values are determined by the three abovementioned sources within the homogeneous areas previously identified (Table 2). Since the Observatory provides minimum (VAOmin) and maximum (VAOmax) land quotations for each crop quality in all the municipalities falling within the provincial territory, to make them comparable with VFM and VAM, VAO has been averaged between the two extreme values (VAOm). Moreover, zones 1, 2 and 3, were unified for both VFM and VAM, because the territorial scope of reference included the three areas considered, unlike VAO which is recorded at municipal level. However, in the latter case, the comparative analysis was made possible by the equality of the municipal quotations reported in the Observatory database relating to the three areas.

Given the purposes of the study, the analysis was carried out by comparing the three values in terms of position (average) and variability, measured as coefficient of variation in each zone among crop qualities. The analysis of these values is also preparatory to identifying the zone/crop quality combinations characterized by most convergent values, by calculating the difference between the highest and the lowest of the three unit land values, as well as to individuating the source which, for the same crop quality, most discriminates the values between the homogeneous zones (Table 3 and Table 4)[8]. In the first case, the aim is to individuate in which zone and for which crop quality the objectivity of an appraisal does not strictly depend on the data source, given the substantial convergence of the three values. In the second case, the analysis allows the appraiser to identify the source which, by attributing greater consideration to the specific characteristics of the areas, given the greater differences between the three values, reports quotations reflecting a more accurate segmentation of the land market.

Table 2. The crop qualities in the homogenous zones.

Crop quality	Zone											
	1	2	3	4	5	6	7	8	9	10	11	12
Arable land					X	X	X	X	X	X	X	X
Irrigated arable land	X	X	X	X	X	X	X			X	X	X
Irrigated garden	X	X	X	X	X	X		X	X	X		X
Orchard	X	X	X	X	X	X	X	X	X	X	X	X
Citrus grove	X	X	X	X		X		X	X			
Vineyard	X	X	X	X	X	X	X	X	X			X
Hazelnut	X	X	X	X							X	X
Walnut orchard										X	X	X
Olive grove	X	X	X	X		X		X	X			
Chestnut	X	X	X			X					X	X
Coppice	X	X	X		X	X	X	X	X			X
High forest	X	X	X									
Meadow					X		X					
Pasture					X		X				X	

Finally, given the availability of an interval between the maximum and the minimum values of VAO, the extent of this range was examined to see whether it was constant or variable by zone and crop quality, in order to check the existence of a correlation between the importance of on-field appraisal – measured as a proxy by calculating the difference between the two extreme values recorded by the OVA – and the land value to be estimated, as represented by VAM and/or VFM.

4.2 Results

In the first stage of the analysis, the average and the coefficient of variation of the three values were cal-

[7] It should be noted that the data used here refer to 2019 for all three sources, since the most recent VAM currently available for the province of Naples refer to that year.

[8] Given that for VAO are established two values, VAOmax and VAOmin, and that VAM are average values, the differences between the three values recorded by the three sources have been measured either for VAOmax or for VAOm.

Table 3. The ranges of variation of unit values (€/mq) in the homogenous zones by crop quality (VAOm).

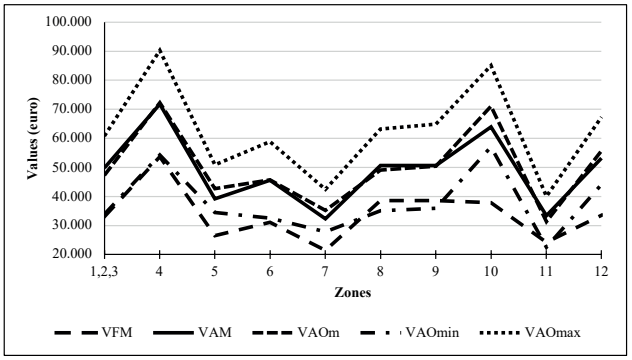
Crop quality	Zones									
	1, 2, 3	4	5	6	7	8	9	10	11	12
Arable land		**0.32**	2.36	1.23	2.36	0.77	0.77	2.81	0.86	2.66
Irrigated arable land	3.38	1.31	2.72	1.98	2.72			3.38	**0.64**	4.75
Irrigated garden	3.82	1.74	3.29	3.48		**1.49**	**1.49**	3.89		5.68
Orchard	2.39	**1.54**	2.79	2.95	2.79	2.25	2.25	3.61	1.87	2.40
Citrus grove	2.72	**2.10**		3.01		2.97	2.97			
Vineyard	1.50	1.66	0.75	1.05	0.75	1.46	1.63			0.51
Hazel grove	**1.34**	2.84							1.94	3.65
Walnut orchard								2.88	1.33	**1.23**
Olive grove	1.17	0.78		1.15		**0.09**	0.19			
Chestnut	0.52			**0.30**					0.76	0.78
Coppice	0.54		**0.22**	0.52	**0.22**	0.24	0.24			0.25
High forest	**0.60**									
Meadow			**0.76**		**0.76**					
Pasture			0.18		0.18				**0.15**	

Table 4. The ranges of variation of unit values (€/mq) in the homogenous zones by crop quality (VAOmax).

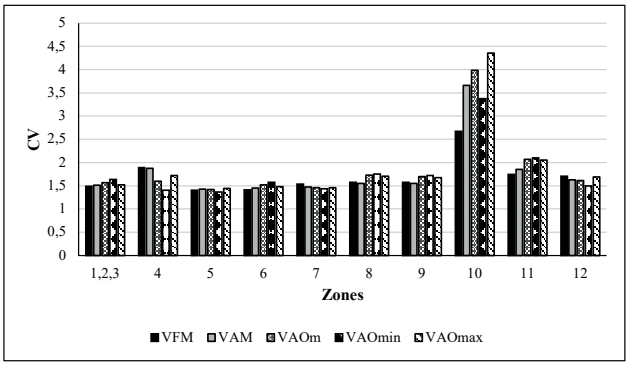
Crop quality	Zones									
	1, 2, 3	4	5	6	7	8	9	10	11	12
Arable land		1.90	3.11	2.18	3.11	1.70	1.70	3.61	1.71	3.36
Irrigated arable land	5.18	4.50	3.77	4.50	3.77			4.58	**2.80**	6.15
Irrigated garden	6.68	6.40	4.74	6.40		**4.70**	**4.70**	5.44		7.68
Orchard	4.29	3.80	4.69	4.85	4.69	3.85	3.85	5.62	3.27	4.10
Citrus grove	4.80	**4.80**		4.80		5.90	6.25			
Vineyard	2.50	2.66	1.50	2.05	1.50	2.64	2.85			**1.50**
Hazel grove	**2.54**	2.84							2.94	3.80
Walnut orchard								4.33	2.33	2.50
Olive grove	1.72	1.33		1.72		**1.20**	1.30			
Chestnut	0.82			**0.60**					1.16	1.18
Coppice	0.77		**0.63**	0.75	**0.63**	0.63	0.63			0.63
High forest	0.90									
Meadow			**1.01**		**1.01**					
Pasture			0.22		0.22				0.24	

culated. As can be seen in Graph 1, VAOm are basically aligned with VAM, while the minimum values are at the same height as VFM for some areas, lower for zones 8 and 9 and significantly higher in zone 10. Moreover, VAOmax are constantly at the highest level in all zones, reflecting, with a trend very similar to that of VAM, the variations in value among the areas differently from VAOmin. The same analysis carried out for crop quality shows several differences compared to the previous, given that VAOmax is not always the maximum value, as it is exceeded by VAM in the case of hazel groves and pastures, and that VFM has the lowest values but with four exceptions: citrus groves, hazel groves, coppices and pastures (Graph 2).

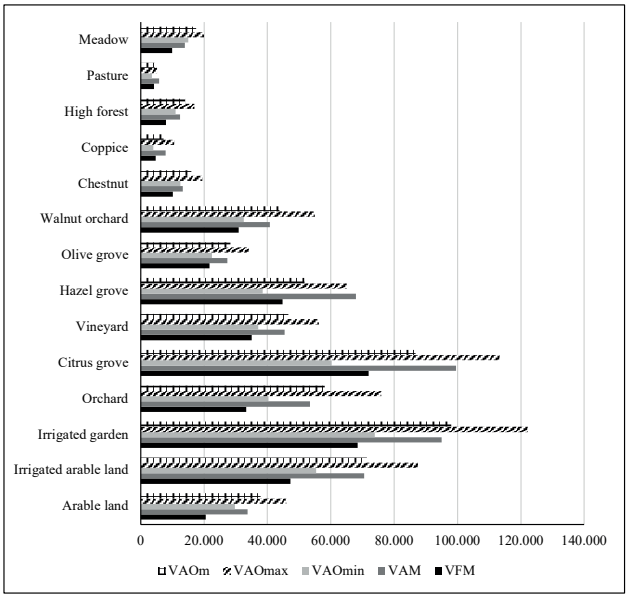
As for variability, the values of the Observatory show a relatively greater differentiation between the crop qualities, and this applies to average values as well as minimum and maximum values (Graph 3). The only relevant exception regards zones 4 and 12, where both VFM and VAM show wider differences. In both areas, however, VAOmax shows a marked variability compared to VAOm and is higher than VFM and VAM in area 12.



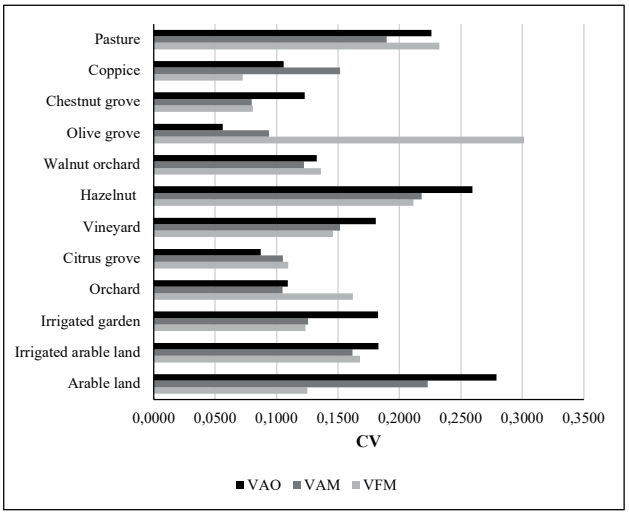
Graph 1. The land values by homogeneus zones.



Graph 3. Land values variability among crop qualities in the single zones.



Graph 2. The land values (€ ha^{-1}) by crop quality.



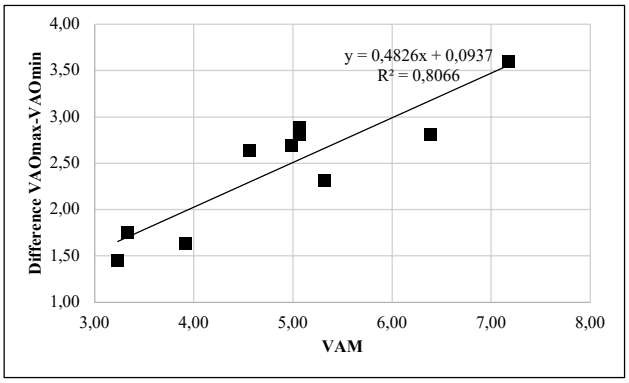
Graph 4. Variability of land values between homogeneous zones by crop quality.

Concerning the identification of combinations of area/crop quality with the highest degree of convergence and therefore a minor range of variation in unit values, Table 3 and Table 4 illustrate how this result can be seen for both VAOm and VAOmax for irrigated arable land in zone 11, irrigated vegetable garden in zones 8 and 9, citrus groves in zone 4, vineyards in zone 12, hazel groves in zone 1-2-3, olive groves in zone 8, coppices in zones 5 and 7 and, lastly, meadows.

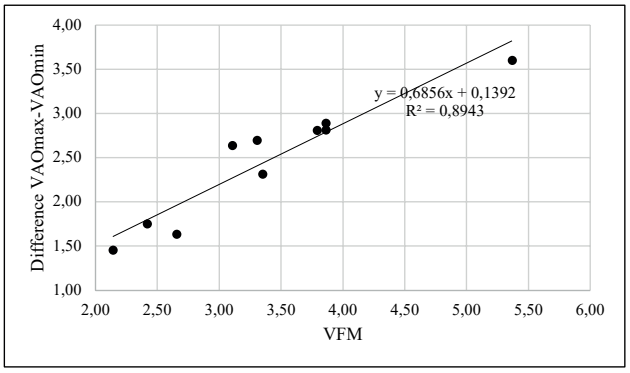
In relation to the value differences among the areas for each kind of crop, the results (Graph 4) show that 7 out of 12 crop qualities (pastures, chestnut groves, hazelnut groves, vineyards, citrus groves, irrigated gardens and arable land) presented the greatest variability among the areas, followed by VFM for 4 out of 12 crop qualities, such as olive groves, walnut groves, orchards and irrigated arable land. The last is VAM, which only in the case of coppices showed the highest differentiations. The high variability of the values recorded by the OVA is most likely due to quotations referring to more limited areas, i.e. those occupied by municipalities, compared to the areas to which VFM and VAM refer[9].

Lastly, the analysis concerning the range of variation between maximum and minimum values recorded by the Observatory and VAM / VFM, Graph 5 and Graph 6 – which refer to the 12 homogeneous are-

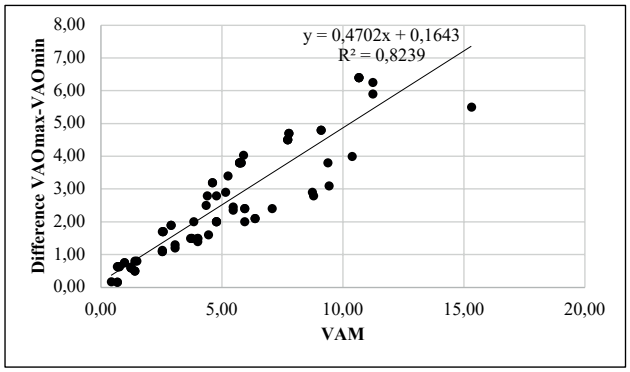
[9] During the presentation of the OVA it was specified that the decision to establish an Observatory of agricultural values arose from the need to give "substance" to the quotations to be calculated, by referring to more homogeneous territorial areas than the agrarian regions to which VAM refer, due to their alleged unconstitutionality, partly because of their abstractness compared to market values.



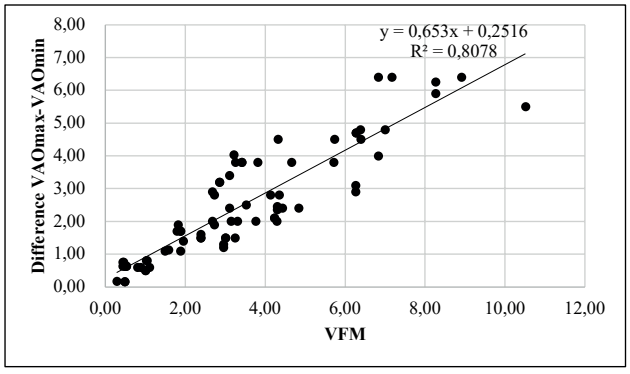
Graph 5. Range of variation of VAO and VAM in the homogeneous zones.



Graph 6. Range of variation of VAO and VFM in the homogeneous zones.



Graph 7. Range of variation of VAO and VAM for all crop qualities in the homogeneous zones.



Graph 8. Range of variation of VAO and VFM for all crop qualities in the homogeneous zones.

as – show that the difference between VAOmax and VAOmin becomes significantly greater as VAM and VFM increase, demonstrating a positive correlation. This means that as the land prices increase, the values from secondary sources become less and less significant and reliable. The same analysis was conducted for the 77 crop qualities recorded in the 12 homogeneous areas (Graph 7 and Graph 8). In this case, with a high level of significance, as the VFM and VAM increased, the interval width between VAOmax and VAOmin also increased, demonstrating here again a positive correlation between the need for expert appraisal and land value. This confirms the vital importance of drawing data from primary sources to which to assign greater weight in estimating the land and, if such data are not available, the necessity of resorting to the income capitalization approach.

5. MAIN REMARKS AND DISCUSSIONS

This paper deals with two different problems which, for those who practice appraisal professionally, may represent two important stages for qualifying a rural appraisal expertise with regard to the metropolitan area of Naples. The first consists in zoning, which can help us to resolve concrete cases of appraisal of the most probable market value of agricultural lands, and also to keep the analytical procedure as a 'last resort', for which the capitalization rate becomes an even more difficult problem to resolve, especially in periods characterized by monetary instability such as that of the present day. On an operative level, it is a question of finding an adequate compromise between widening the space in which to look for comparables (thus increasing the probability of recording enough observations to reduce the probability of using the analytical appraisal) and narrowing the area to increase the likelihood that the observations belong to the same market segment. Furthermore, apart from the number and the quality of observations, the choice of

narrowing the space produces, within the capitalization procedure, opposite effects to the former, because in this case it is necessary to use the indirect method for selecting the rate, thus creating other problems concerning the identification of investments similar to land, so much to arouse "*little hope of sufficiently approaching the rate pertaining to the specific case*" (Famularo, 1963, p. 77). This study offers important indications regarding areas with the same extrinsic characteristics, within which to look for comparables with the same intrinsic characteristics.

The second stage involves the analysis of the data from secondary sources that contribute to defining the mercantile framework for land appraisal in terms of market value. The estimation of this value by the synthetic procedure is usually based on the experience and competence of the appraiser. To ensure objectivity, the appraisal judgment should be demonstrable and verifiable by estimates of the same property performed by other experts who, being rarely consulted, ensure the objectivity of the analytical procedure on the basis of the postulate of ordinariness. Consequently, the "most probable" market value implies the highest probability of being confirmed in real terms, i.e. the value that most experts would attribute to the appraised subject (Simonotti, 2013).To this end, the choice should fall primarily on the sales comparison procedure because is the most reliable way to estimate land value, but only if appropriate data are available. In fact, unlike urban estimates, rural appraisal for estimating agricultural land must address the issue of availability and consistency of data, as there are few sources of information (CONAF, 2021). Obviously, the appropriateness of the data depends on the consulted sources, of which the primary source of information on land sales is the Real Estate Advertising Service of the Land Agency. Lacking this information, or where there is a problem regarding price veracity in supporting the estimated value, the appraiser should determine what additional data would be valuable and from what sources it can be obtained, to estimate a value as objectively as possible[10]. For this reason, this study shows some basic descriptive characteristics of "online" data which are usually inserted in the appraisals, especially VAM and, in recent years, VAO, to which VFM have been added here since on them the judgment of adequacy of the purchase price of agricultural lands was based, while retaining the need to take into account "*the specific structural and productive elements that make up the individual lands*" (Law no. 590/1965, art. 4) defined as "rustic", presumably because, of all the factors influencing the values, only those of agricultural merit were considered[11]. The last point is fundamental in discriminating between agricultural and market value of a land for agricultural use, because, independently from the data availability, it suggests the appraisal procedure to be applied. In the first case, in fact, only the discounted stream of future rental values is suitable, while in a territory such as the Neapolitan metropolitan area where changes in land use expectations are high, the market value includes a component of "hope" value – i.e. the existence of other possible, but not yet legal, uses (Drapikovkyi et al., 2020) – which is realistically and objectively appraisable only through procedures based on the market approach[12].

VAM, on the other hand, before the Unconstitutionality Judgement no. 181/2011, constituted an indemnity whose assessment had a substantially different purpose than that of VFM. Despite this judgment, VAM continue to be published exclusively for calculating additional indemnity for both landed and non-landed farmers, based on D.P.R. no. 327/01, art. 40, subparagraph 4 and art. 42 respectively, thus representing a sort of compensation for labour and business income losses, rather than compensation for the propriety damage resulting from a loss of ownership rights. From this point of view, at least in the years after 2011, VFM are theoretically more consistent with the patrimonial content that the estimated value of an agricultural land must assume, which analytically translates into an income capitalization deriving solely from land ownership.

Concerning VAO, these prices are elaborated using empirical methods by qualified professionals operating in the territory, consulting both public deeds of sale and sale offers. The quotations are obtained by verifying the consistency between the various announcements and subsequently proceeding with the ordinary reduction of the asking price during the conclusion of the agreement. The values are the ordinary minimum and maximum quotations that agricultural land located in the various local contexts can reach, while exceptions may be made for land with singular characteristics, and in this case the value may differ from those recorded. Fur-

[10] This is a problem that in the past induced Grillenzoni to promote a "bank of prices" of the real estate sales in agriculture (Grillenzoni, 1970).

[11] Unlike the other two values, the law establishing VFM is not explicit on this point.

[12] Naturally, the analytical procedure is suitable for appraising the market value in the absence of data on market prices, but not if the latter are available. The discounted stream of future rental values matches the market value if the direct method for calculating the capitalization rate is applied. Otherwise, in the analytical procedure the land-use change expectations can be included in the market value only by reducing the capitalization rate whose entity, which has so great an impact on the value, lacks objective referments. However, the problem of appraising thoroughly (and following a realistically applicable procedure) the market value of agricultural lands having a component of hope and lacking market prices for similar lands is a matter to be studied in greater depth.

thermore, in determining the values, the Observatory considers only the factors that affect agricultural profitability and none others, such as the land's suitability for future development due to its proximity to built-up areas, its position in particularly high-value landscape contexts and, lastly, whether it is calculated net of any existing rural buildings. In the light of the calculation method, the Observatory specifies that VAO "*cannot be considered a substitute for the 'appraisal', even if aimed at ascertaining pure agricultural merit, but only as an aid to it*" (Osservatorio dei Valori Agricoli, 2020).

By observing the ranking of the zones in terms of value, it is evident that, practically speaking, the three values express land prices only based on the intrinsic characteristics, and not those related to the area in which the land is situated. In fact, in the areas of greater landscape and environmental value, which are, not unexpectedly, characterized by the presence of high-value residential properties, the values of agricultural land are lower than those recorded in less valuable contexts. This finding proves that the three values are reliable in expressing the real value of lands exclusively for agricultural use, net of the value of the properties invested in them, which however, cannot be properly defined as 'market value' since, especially in the more densely populated and highly urbanized areas, the operators' expectations include appreciation that is not limited exclusively to agricultural merit and takes into account factors that influence prices without affecting the rental value. For this reason, it can be argued that the value of a land in the area/crop quality combinations for which the variability of quotations is relatively low, can be interpreted as a 'minimum' threshold of the real market value which exceeds the use value in agricultural production in most of the Neapolitan metropolitan area. This result can be useful in estimating the definitive indemnity in the case of total expropriation for public utility. In fact, while sentence no. 181/2011 of the Constitutional Court, intervening on subparagraphs 2 and 3 of art. 40 of the Consolidated Text 327/2001, declared the unconstitutionality of VAM in determining the provisional indemnity, this did not apply to subparagraph 1 of the same article. This subparagraph, in fact, regulating the formulation of the definitive indemnity, refers to the "*criterion of the agricultural value taking into account the crops actually grown on the land and the value of the buildings legitimately built, also in relation to farm operation, without evaluating any possible or actual use other than agricultural*".

The analysis of these values highlights some useful information in the context of operative rural appraisal. Firstly, VFM are ranked as the minimum values even of VAOmin except for a few zones and crop qualities. Moreover, at zonal level, VAM is substantially in the middle between VAOmax and VAOmin, while by type of production, the dynamic is less regular, showing in some cases that it exceeds VAOmax and is lower than VAOmin. By matching these findings by zone and crop quality, we see that is not possible to obtain an absolute ranking between these values. Moreover, knowledge of the combinations of area/crop quality with the greatest convergence of values is useful to the appraiser, making it possible to assign a higher degree of objectivity to the appraisal judgment since it is substantially 'independent' from the choice of the secondary sources of data, which usually support the estimate itself.

As regards the differences between homogeneous areas that should reflect in different values for lands with the same crop qualities, the OVA quotations prove to be more reliable, partly as a result of the investigation carried out at municipal level. From this point of view, VAM are confirmed as the least significant values, as they refer to agrarian regions (particularly extensive in the territory of the Metropolitan City of Naples) in which, taking into account the same land productivity, the varying intensity of the factors affecting land demand and the fluctuating competition with agriculture for land use, they reduce the possibility of profitably by inserting these values within the mercantile framework. Therefore, the analysis rebuts the validity of certain statements that consider the agrarian regions to be sufficiently homogeneous, such that the comparables must be found within them. On the other hand, as has been pointed out (Marone, 2008), the territorialization defined by agrarian regions is the result of the breaking down of the national territory into circumscriptions (ISTAT, 1958), not for estimative purposes but for sectorial statistics geared to defining economic policy lines (Povellato, 1997).

Furthermore, the difference between VAOmin and VAOmax increases as land prices rise. While, on one hand, this finding seems to confirm that the non-agricultural factors show to be more relevant in zones with higher agricultural land prices (Lehn and Bahrs, 2018; Nilsson and Johansson, 2013), on the other hand it implies, especially in these cases, that the agricultural values recorded by the three sources cannot play any other role than that of support in carrying out an accurate expert appraisal judgment. Where the purpose of the appraisal, however, is the assessment of the agricultural value of land, the results show that for some area/crop quality combinations the three values can provide a significant indication of the value to be appraised, without prejudice to the need for the estimate to be based on expert "on-field" activity, to adequately justify the value to be attributed to the land being estimated.

6. CONCLUSIONS

The purpose of this study was twofold: *a*) to identify the zoning of the metropolitan city of Naples for estimative purposes, to achieve the relative observations necessary for applying the sales comparison procedure; *b*) to analyse three locally available land values collected from three sources, two official and one unofficial, which provide useful information for those who have the task of drawing up appraisals aimed at estimating the agricultural and market values of lands. This has made it possible to provide useful answers to the questions of those who practice the appraisal professionally, concerning: *a*) the market segmentation in terms of extrinsic characteristics in such a highly heterogeneous territory as the metropolitan city of Naples; *b*) the comparative analysis of three values recorded from secondary sources, producing useful indications concerning the 'independence' of the objective appraisal from the choice of source; *c*) the identification of the secondary data that are most reliable in estimating the value of agricultural land; *d*) the growing importance of on-field appraisal in the case of higher land values.

We are convinced that the approach could be usefully applied in other territories where zoning is necessary to solve problems relating to the spatial variable in identifying the comparables, as long as relevant zonings are available. This does not, of course, solve the problem of delimitation based on the municipal boundaries of the homogeneous zones, which does not take into account that in some cases, even within the same municipality, there might be areas characterized by different land values for the same crop quality.

The follow-up of this study might focus on two research lines. The first regards a potential zoning based on VAO, given that these values are recorded at municipality level. The second concerns the conducting of the analysis of the three values in each municipality that is not part of the homogenous zones. This makes it possible to calculate the difference, if market prices are available, between the latter and the agricultural value of lands classified from an urban-planning point of view as 'non-development', which can be useful in solving many actual cases of appraisal.

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ORCID:
LR: 0000-0002-3386-2390
LP: 0000-0002-8264-1674
AT: 0009-0001-6065-6330
AB: 0000-0002-7049-4144

The Italian National Strategy for Sustainable Development and the Covid-19 impact: a regional analysis

Lucia Rocchi[1,*], Luisa Paolotti[1], Arianna Tiralti[1], Paolo Stranieri[2], Antonio Boggia[1]

[1] *Department of Agricultural, Food and Environmental Sciences, University of Perugia, Italy*
[2] *ARPA Umbria – Agenzia Regionale per la Protezione Ambientale, Italy*
E-mail: lucia.rocchi@unipg.it, luisa.paolotti@unipg.it, arianna.tiralti@unipg.it, p.stranieri@arpa.umbria.it, antonio.boggia@unipg.it
*Corresponding author

Abstract. The Italian National Strategy for Sustainable Development plays an important role in the national implementation of the 17 Goals for sustainable development set globally through the 2030 Agenda of the United Nations. The achievement of such goals in Italy is linked to the strategic choices and objectives established at the national level. The purpose of this work is to monitor the performance of the 20 Italian regions in 4 of the 5 areas of the Agenda (People, Planet, Prosperity, Peace) over a period of time ranging from the implementation of the National Strategy to the post-pandemic. To do this, a set of representative indicators was created and a geographical sustainability assessment tool (SSAM) was used, which operates through a multicriteria analysis model perfectly integrated into a GIS environment. The results showed a strong regional variability and a radicalized North-South gap. Moreover, the monitoring between the different years (2017-2019-2021) showed the initially positive impact of the strategy, mainly due to the Planet dimension, but also the negative one that COVID-19 caused to all the regions, with different intensity depending on the dimensions considered.

Keywords: Agenda 2030, Sustainable development, Spatial MCDA, 5Ps.
JEL code: Q01.

1. INTRODUCTION

The Italian National Sustainable Development Strategy (NSDS) is the strategic reference framework for sectorial and territorial policies in Italy, having the aim of planning a vision for the future and development focused on sustainability, as a shared and essential value to face the global challenges of the country (Ministry of Ecological Transition, 2020). The National Strategy was approved by the Interministerial Committee for Economic Plan-

ning of the Italian Government, on December 22, 2017, and subsequently updated in 2022. It represents the first step to implement the principles and objectives of the 2030 Agenda for Sustainable Development at the Italian national level.

The 2030 Agenda is an action plan designed for the prosperity of people and the planet, established in 2015 by the United Nations. The Agenda promotes global peace and the eradication of poverty in all its forms and dimensions, representing the current world's greatest challenge for achieving true sustainable development (United Nations, 2015). The NSDS adopts the four guiding principles of Agenda 2030: integration, universality, transformation, and inclusion.

The process of defining the NSDS started at the beginning of 2016, with the elaboration of the "Positioning of Italy concerning the 2030 Agenda", a first attempt to verify the distance of the country from the targets set by the Agenda. In fact, the Agenda is based on 17 Sustainable Development Goals (SDGs), organized into 169 targets, identifying global sustainable development priorities through the three pillars: economic, environmental, and social (Stevens et al., 2016). On this basis, the main strengths and weaknesses of Italy have been recognized, to identify the opportunities and challenges to which the NSDS should respond.

The Italian Strategy is structured in five areas, corresponding to the so-called "5Ps" of sustainable development proposed by the 2030 Agenda: Peace, People, Planet, Prosperity, and Partnership. Each P represents a specific mission to achieve, grouping several goals and tasks along the strategy. Peace promotes peaceful but also just and inclusive societies, free of fear and violence, based on the belief that there is no sustainable development without peace and no peace without sustainable development. Behind ending poverty and hunger in all their forms and dimension, people aim to ensure that all human beings can fulfil their potential in dignity and equality. Planet focuses on the protection of the earth from degradation, through sustainable consumption and production, sustainably managing its natural resources, and taking urgent actions on climate change, in order to support the needs of the present and future generations. The mission of Prosperity is the achievement of a satisfying and prosperous life for all human beings, not only considering economic progress but also social and technological ones. The partnership has an even broader scope because it aims to mobilize the necessary means for the implementation of the 2030 agenda through a renewed Global Partnership for Sustainable Development. In particular, it focuses on enhanced global solidarity with the participation of all countries, all stakeholders, and all people.

Each area contains some "Strategic Choices", declined in "Strategic Objectives" specific to Italy, related to the SDGs and to the targets of the 2030 Agenda (Fig. 1). A sixth area is dedicated to the "vectors for sustainability", to be considered as essential elements for the achievement of the national strategic objectives.

The strategic choices identify the priorities to which Italy is called to respond. They reflect the transversal nature of the 2030 Agenda, integrating the three dimensions of sustainability (Ministry of Environment and Land and Sea Protection, 2018). The objectives have a highly integrated nature, as the result of a process of synthesis and abstraction of the most important issues that emerged from the consultation process, dealing with multiple dimensions and areas of priority action. This framework represents a synthetic approach for expressing the complexity of the 2030 Agenda (Italian Strategy for Sustainable Development, 2017).

As for the 2030 Agenda, the measurement of the progress towards the achievement of the Strategic Objectives is a crucial point in the NSDS. Observation, measurement, and assessment of the strategy are essential for the successful fulfilment of the NSDS objectives. A consistent assessment allows governments to make

Figure 1. From Agenda 2030 to the National Strategy for Sustainable Development (NSDS).

evidence-based decisions, to incentive or correct specific issues, allowing citizens, at the same time, to monitor the government's activities. Monitoring progress towards SDGs is an important task that must be rigorously undertaken to evaluate the outcomes of the actions already implemented and to address the unfulfilled goals for the next decade (Carrillo, 2022).

Until now most of the effort to assess progress towards the 2030 Agenda is nation-based, because of the good quality and quantity of data at this scale and because it is possible to refer directly to the targets and goals of the Agenda. However, recently more attention has been paid to the attainment of SDGs at the local level. Sustainable development is considered achievable if it originates on the local level, following a bottom-up approach from local to supranational (Ravetz, 2000). Therefore, systems at a local level must be investigated in order to have effective and realistic evaluations of specific territorial contexts and to determine sound planning actions (Boggia et al., 2018).

However, still, few works evaluating the sustainable development of Italian Regions or municipalities concerning Agenda 2030 or NSDS are present. The importance of the diffusion of sustainable development at the local level was recognised by Farnia et al. (2019), who addressed the issue of measuring the Agenda 2030 goals at the urban level in Italy. In particular, they built a composite index for the analysis of 98 Italian municipalities, using 53 indicators representing the three dimensions of sustainability. In terms of methodology, the Spectral Value Decomposition (Farnia, 2019) was applied, clustering both indicators within each Goal and the Goals themselves for obtaining a Sustainability Index. The results showed geographical and demographic heterogeneity within the country, underlining how complex phenomena are due to the multidimensional aspects of Agenda 2030. Also D'Adamo et al. (2022) compared the sustainability of 103 Italian cities through the evaluation of 45 SDGs indicators, ranking cities based on their performance, by means of a Multicriteria Decision Analysis, in particular the Analytic Hierarchy Process (AHP) (Saaty, 2008). Results showed strong disparities across Italy with three northern cities at the top of the ranking and many southern cities at the bottom. Mascarenhas et al. (2010) emphasized how it is widely recognized that action towards sustainable development is most effective at the local scale, but that there are common resources for which efficient management occurs at a supra-municipal scale, i.e. at the regional level. Indeed, they argued that the regional scale is a good level of governance for planning, coordination, and evaluation of action towards sustainable development. Finally, Alaimo and Maggino (2019) evaluated the sustainability of the Italian regions, using the Adjusted Mazziotta–Pareto Index (Mazziotta and Pareto, 2016) for creating a composite index for each goal considered.

As we saw, sustainability assessment can be developed using many different approaches, depending on the objectives, the scale, and the scope. The complexity of sustainability assessment requires structured, transparent, and reliable tools, and Multi Criteria Decision Analysis (MCDA) can play an important role (Cinelli et al., 2014), managing information from different indicators comprehensively within an integrated assessment approach. MCDA assumes a central role in the multidimensional evaluation process. It is used to solve complex problems by assessing all the variables, both individually and collectively, and assigning specific importance to each one (Cortina and Boggia, 2014). Thus, MCDA has been widely used to evaluate sustainability (Liu, 2007; Shmelev and Labajos- Rodrigues, 2009) and has been indicated as the appropriate tool for its assessment (Bond et al., 2012; Munda, 2005).

The approach proposed in this paper is based on Spatial Multicriteria Analysis, which demonstrated its adaptability in performing Sustainable Development Assessment (Boggia et al., 2018; Chen et al., 2010; D'Adamo et al., 2022; Massei et al., 2014; Paolotti et al., 2019; Papadopoulou-Vrynioti et al., 2013; Rahman et al., 2012;). Dealing with spatial decision problems means combining and transforming geographical data (input) into a resultant decision (output), interfacing a Geographical Information System (GIS) with MultiCriteria Decision Analysis (MCDA) methods (Massei et al., 2014). This kind of approach allows for a perfect integration between the geographical component and the multicriteria analysis, exploiting the benefits of both elements.

In particular, the Spatial Sustainability Assessment Model (SSAM) was applied. SSAM is a powerful tool for performing sustainability analysis of different territorial areas at different scales, using a multiple criteria approach, and obtaining a sustainability index starting from environmental, social, and economic indicators.

Therefore, the aim of this work was to propose an evaluation framework for assessing the progress of the Italian regions in terms of SDGs, within the strategic borders provided by the Italian National Sustainable Development Strategy. The Italian regions were evaluated by means of the SSAM procedure, in relation to a set of indicators associated with SDGs and complying with the strategic objectives of the national strategy, for assessing the relative level of sustainable development reached by each region. It is a more local approach in comparison to other studies involving Italy (Ricciolini et

al., 2022; Rocchi et al., 2022) as it considers the regional scale, allowing for a juxtaposition across the different Italian regions, whit reference to the EU NUTS 2 classification. Moreover, the analysis includes a period that allows for a baseline (2017, the year of ratification of the NSDS), a first step of progress (2019), and some COVID-19 short-term effects on sustainable development (2021).

2. MATERIALS AND METHODS

2.1 Framework construction

2.1.1. Indicators selection

For evaluating the performance of Italian Regions on their path to sustainable development, in the framework of the national strategy, we defined a set of indicators that were methodologically in line with the goals of the strategy itself and derived from the 2030 Agenda. The indicators have been selected to cover four of the 5Ps of the Agenda, which are: People, Planet, Prosperity, Peace, and Partnership. The excluded P was Partnership since it is not covered enough at the regional level. It is more focused on a national rather than regional or local scale. Moreover, Partnership is mostly a condition for a better and faster achievement of sustainable development, mainly focused on the cooperation between Countries, to overcome disparities.

The selection of indicators is a crucial step in the study as they are a key tool for monitoring and evaluating different sectors and levels of governance. In particular, the indicators of the SDGs can be seen as a potential beacon to guide humanity on the right course towards sustainability (Lyytimäki et al., 2020). The framework proposed in this paper does not aim to define a specific method of choosing indicators, but rather to indicate a possible path for supporting the evaluation processes of regions' performance in achieving Sustainable Development Goals with the help of a geospatial tool. In addition, the construction of such a framework is subject to the availability of data for monitoring the 2030 Agenda, which is still not always adequate for the assessment of regional units, although it is rich in European countries if compared to other geographic contexts.

The selection of indicators that best fit the object of the research, which was, in this case, to evaluate the level of Sustainable Development of Italian regions regarding the NSDS, starting from the set of indicators dedicated to the SDGs made available by ISTAT (Italian National Institute of Statistics). ISTAT, like the other national statistical institutes, is called by the United Nations Statistical Commission to play an active national coordination role in the production of indicators for measuring sustainable development and monitoring its objectives. Periodically, therefore, the Institute updates and extends the breakdowns of the statistical measures useful for monitoring the sustainable development objectives of the 2030 Agenda[1].

Starting from this database, which contains all the statistical measures useful for monitoring the SDGs of the 2030 Agenda, an accurate selection was made to find the indicators that best represented the strategic choices and objectives of the NSDS. To correlate the objectives of the Strategy with the proposed indicators, an analysis with experts was conducted which allowed the creation of the final framework of indicators. The selected criteria that have been taken into account in this process are:

- representativeness of the topic;
- regional data availability;
- availability of data for the years under analysis and the possibility of updating data over the years;
- avoid the presence of redundant or overlapping indicators.

Considering the NSDS approval date (December 22, 2017) and in the light of the pandemic event, for proper monitoring of sustainability performance over time, 3 analyses were carried out with reference to 3 different years: 2017 (the year of publication of the Strategy), 2019 (two years post-release and pre-pandemic), 2021 (three years post-release and post-pandemic). In case of missing data for the reference years, those closest available were used. Punctual lack of data (i.e.: a singular missing data for a singular region) was rare: also in these cases, the first available data was traced back.

At the end of the choosing process, the total number of selected indicators, which is 47, was divided into the 4 pillars of People, Planet, Prosperity, and Peace according to the choices and objectives of each pillar. People includes 14 indicators; Planet 8, Prosperity 15, and Peace 10. Overall, the selected criteria belong to 14 of the 17 SDGs on the Agenda. Goals 6 (Clean water and sanitation), 14 (Life below water), and 17 (Partnerships for the goals) remain outside since they are not represented by any indicator.

Tables 1, 2, 3, and 4 in Appendix A show the list of all the indicators divided by P. For each indicator, the following information is highlighted: the pertinent SDG (column 1), the reference code of the indicator (column 2), the connections with the NSDS strategic choice and the National strategic objective (columns 3-4), whether they are gains (to be maximized) or costs (to be mini-

[1] https://www.istat.it/it/benessere-e-sostenibilità/obiettivi-di-sviluppo-sostenibile/gli-indicatori-istat (last update: 12 October 2022).

mized), the source of the data, and the relative unit of measurement.

2.1.2 Weighting phase and aggregation

In multicriteria analysis, two key phases are the definition of the weights for the criteria used and the aggregation of the weighted criteria, after their normalization. The weighting step can be carried out in two different ways: involving the experts or decision makers, who base the weighting definitions on their own experiences, knowledge, and perception of the issue; or using an objective weighting process, which is carried out independently from the subjective preferences, applying, for instance, statistical approaches (Zardari et al., 2015). This second option allows to objectify the assessment model and can be successfully applied in complex scenarios, in which the subjective weighting approach may lead to unsatisfactory results because the decision-maker(s) and/or experts are unable or unwilling to provide cohesive and exact numerical judgments for all the criteria (Boroushaki, 2017; Rocchi et al., 2022). Due to the high number of expertise areas covered by the NSDS, it seems proper to adopt an objective approach. In particular, in this work the mean weight (MW) method (Deng et al., 2000; Diakoulaki et al., 1995) has been applied. In the MW the weights were derived objectively using the following equation:

$$w_j = {}^1/(n_c{}^*n) \quad [1]$$

Where n_c is the number of pillars and n is the number of indicators within the pillar. This method assumes that indicator pillars are of equal importance. The national strategy does not discriminate between priorities to be achieved, therefore it is not correct to apply different weights among the different strategic choices identified in it. Different weights can be proposed if individual regional priorities, which may differ from each other, are evaluated; however, this aspect is not part of this analysis. As reported by Miola and Schiltz (2019), the use of unequal weights could lead to overestimating some dimensions that are growing faster, giving them greater weight, or conversely to underestimating those in which one is further behind.

The normalization and the aggregation of the criteria within each P and then into a final global score was made using the Spatial Sustainability Assessment Model (SSAM). SSAM is a powerful tool for performing sustainability analysis of different territorial areas at different scales, using a multiple criteria approach, and obtaining a sustainability index starting from environmental, social, and economic indicators. This tool went through two updates, one in 2014 and another in 2021 (Boggia et al., 2018; Rocchi et al., 2022), changing also its name. The first update in 2014 was from UmbriaSUIT to GeoUmbriaSUIT, which allowed for complete integration of the multicriteria analysis with the geographical dimension since the use of GIS was introduced and the MCDA and GIS shared the same database and interface (Boggia et al., 2018). Moreover, the algorithm implemented within the procedure changed from weighting summation to TOPSIS (Hwang and Yoon in 1981). The last release in 2021 mainly included updates regarding the user experience (i.e. the input of the data or the customization of the analysis) and the typology of vector file supported.

The multicriteria algorithm used in SSAM is the TOPSIS (Technique for Order Preference by Similarity to Ideal Design) which generally defines a ranking based on the distance from the worst alternative and the proximity with the best one, represented by the lowest and highest value of each indicator, respectively, or vice versa, depending on whether it is an indicator to be maximized or minimized. The goodness of this type of approach in assessing the sustainability of countries or regions has already been demonstrated by several other authors (Bilbao-Terol et al., 2014; Boggia et al., 2018; Paolotti et al., 2016; Rocchi et al., 2022). In this study to have a more reliable comparison between the three years, we used the same worst and best points, considering the worst and best performance for each indicator over the entire period under consideration. In this way, the score achieved by a particular region is sensitive to the improvement or worsening of the remaining ones, considering the entire time horizon, i.e., we have a relative assessment. Then, the indicators representing each of the three dimensions can be treated individually, resulting in three distinct indices, for each geographic unit analyzed, i.e., environmental index, economic index, and social index. Optionally, one can also weigh the values of the three previous indices resulting in a global aggregate sustainability index (Boggia et al. 2018). The Global index is built using the weighted sum of the dimensions, therefore is useful for having a synthetic picture of the sustainability level.

After the aggregation process, the results are presented for reading and interpretation, either in the form of letters and numbers or in graphic format (maps, cartograms, and graphs). This graphical output in the form of maps illustrates the results of the multicriteria analysis for each feature that makes up the studied region, through a choropleth map, where the different colours represent the level of sustainability (Boggia et al., 2018;

Rocchi et al., 2022). Of course, because of the full integration between the MCDA and GIS, numerical outputs can be rearranged and elaborated directly into QGIS, giving more personalized results.

A major advantage over the previous version is the possibility of having more flexibility about the number of dimensions that can be included. With GeoUMBRIASUIT it was only possible to insert the three pillars of sustainability (environmental, social, and economic), which are usually the ones most applied. With SSAM, on the other hand, dimensions can be removed, substituted, or added, as is the case of this work, which includes four of the 5Ps into which the 2030 Agenda is organized (Rocchi et al., 2022).

3. RESULTS AND DISCUSSION

3.1 The Global Index

Figure 2 reports the Global Index, which gives us a picture of the global situation for each year, without any details about the performances for the singular P. From the geographic distribution of the index, it is possible to have a first, quick, and easy understanding of the general level of Sustainable Development (SD) of the Italian Regions, as well of their state of progress towards the Strategy priorities fulfilment. The alternatives are grouped in a 5-classes scale, from very low to very high values of the index: the darker the colour the higher the sustainable development level. The definition of the class range was established by using the maximum and minimum values of the entire three-year period as extremes and then applying a QGIS function (equal intervals algorithm). In general, from the maps, it is possible to note a better situation in terms of SD of the North and of the Centre in comparison to the South, for all the periods examined. The passage from 2017 to 2019 highlighted a general enhancement of the sustainability performances of all the Italian regions. In 2019 none of them was in low or very low classes, and at the same time, the number of regions in the very high-class tripled, moving from 2 to 6. On the other hand, the comparison between 2019 and 2021 identified a general worsening of the SD level. Most of the regions (11 out of 21) were ranked within the Medium class, while all of them in 2019 were at least in the High class. None of the regions could be classified as Very high, denoting a worsening not only in comparison to 2019 but even to 2017, when some regions were in class Very high and the group of class High was larger. Moreover, in 2021 three regions fell into the Very low class, and for two of them, it was for the first time (Campania and Sicily).

The highlighted tendency is even clearer if we consider the aggregated data for the geographical repartitions of north, central, and south Italy (Figure 3). In 2017 and 2019 there were no differences between north and central Italy, and the south reduced its distance in terms of global sustainability between the two years. Then, the 2021 performances denoted a worsening in the three areas, which was greater for the central and south Italy.

Although the Global index is useful for a quick understanding of the general sustainability performances of the considered areas, it is not enough for deep analysis. Therefore, it was necessary to analyse the results

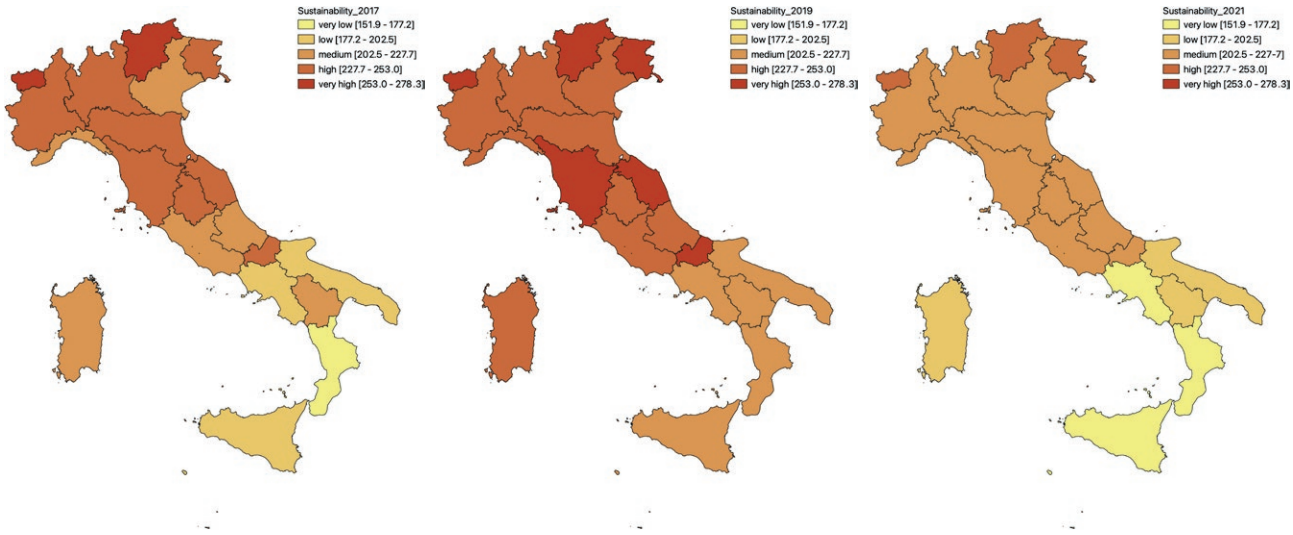

Figure 2. Global index – regions distribution.

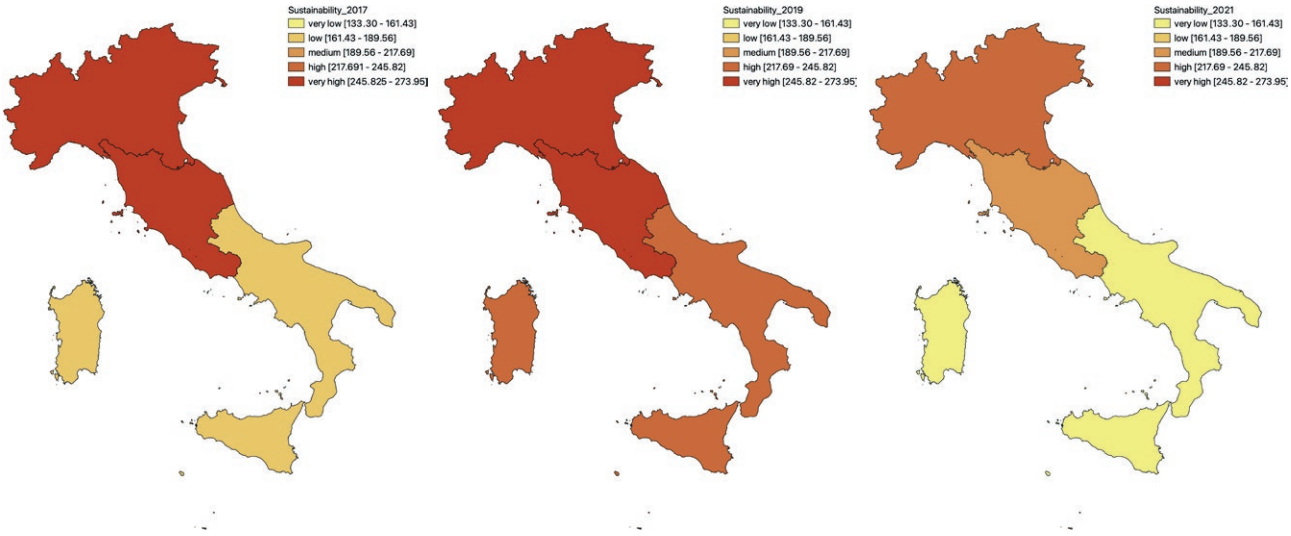

Figure 3. Global index- geographical repartitions distribution.

of the 4 Ps, which contribute to the composition of the overall index.

3.2 The Ps Indices

The Global Index is built on four indices, one for P (Peace, People, Planet, Prosperity): each of these dimensions contributes differently in the composition of the overall index. Figure 4 reports for each Ps Index the range of the values and the median, represented by the dot, for the Italian regions. Starting from the left there are the four Ps indices, and for each index there are the three years, one next to the other. The first index on the left (Peace) showed a general decrease between 2017 and 2019, while in 2021 there was a reduction of the range between the top and bottom because of an improvement of the lowest values and also a deterioration of the best ones. This trend was due to the complex combination of the Peace indicators which do not have too many affinities both in the trend over the years and in the geographical distribution. To explain the decrease in the general performance between 2017 and 2019, we can state that the improvements noted for some indicators (e.g., 'Irregularly employed', 'Perception of safety walking alone in the dark') were too slight and not enough to compensate for the indicators with negative variation, especially for the indicators that showed the greatest decline for almost all the regions ('Percentage of permits issued for political asylum and humanitarian reasons' and 'Crowding of prisons'). In 2021 some indicators had a shortened range of values that may be due to the simultaneous worsening of performance for regions that were previously better (e.g., 'Percentage of permits issued for political asylum and humanitarian reasons'), the improvement of those that were previously worse (e.g., 'Women and political representation at the local level'; 'Number of victims of intentional homicide', 'Perception of safety walking alone in the dark', 'Crowding of prisons') or both (e.g., 'Ratio between the employment rates (25-49 years) of women with children and women without children'). This resulted in an unchanged median value. Over the period analysed, a continuous trend could be observed for two indicators in different directions: 'Percentage of permits issued for political asylum and humanitarian reasons' decreasing and 'Perception of safety walking alone in the dark' growing.

The People index pointed out an improvement between 2017 and 2019, more significant for the values in the first and second quantiles. However, in 2021 the general performance dropped severely: the highest value of the index in 2021 was under the median value of both 2017 and 2019. Looking at the data, the causes of this drop could be multiple. Poverty data ('Risk of poverty or social exclusion') showed a marked worsening, along with a severe falloff of GDP pro capita growth ('Annual growth rate of real GDP per inhabitant'), which involved all the regions although with different strengths. Furthermore, some criteria linked to the quality of life showed a great worsening ('Excess weight among children aged 3 to 17 years'; 'Smoking (Standardized Rates)').

The trend of Planet over the three years is the most peculiar among the four indices. Like People, we observe an improvement of performance in 2019 and a subse-

quent decline in 2021. The jump between 2017 and 2019, however, was more pronounced than in People while the subsequent decline brought the performances back to a level comparable to 2017, although with a slight improvement in the edge values. Moreover, in 2019 there was a great reduction in the range of values, proving a general enhancement of the environmental performance in all the regions since even the worst had results comparable to the ones shown by the top group in 2017. This result could be probably due mainly to three indicators: 'Forest fire impact', 'Illegal building', and 'Emissions of PM10'. The three indicators had a constant positive trend from 2017 and 2019 (except the South of Italy for 'Emissions of PM10') while from 2019 to 2021 the two indicators related to forest fires and to PM10 had a great decline, for almost all the regions. In addition, the 'Percentage of people living in homes with structural problems or humidity problems' had a sensible decline between 2019 and 2021. In relation to the 'Forest fire impact' indicator, we also investigated the historical data series starting from 2005, and the results showed that in the years 2017 and 2021 there were two outlier years for the whole country, being also the Italian average data higher than in the rest of the historical series. It is also to note that, for the dimension Planet, three other indicators remained essentially constant from 2017 to 2021 ('Protected areas', 'Incidence of urban green areas on the urbanized surface of cities', 'Fragmentation index of the natural and agricultural territory'); therefore, the results within the dimension were very influenced by the variations in the other indicators, already mentioned.

Prosperity's trend was close to that presented by Peace, although in the opposite direction between 2017 and 2019, and with overall smaller changes. In particular, it showed a small improvement between the first two years, mainly in the top values area, and then in 2021 there was an improvement of the lowest values with a contemporary deterioration of the best ones. Moreover, Prosperity showed a very low value of the median in all three years. For a better comprehension of the results, we considered the economic, social, and technological sub-dimensions. For the economic dimension, the most interesting criterion was 'Gross disposable income per capita', which showed an increment in 2019 and then a decrease in 2021; these changes were different between regions with the highest and lowest absolute incomes. Between 2017 and 2019, the income increased less in percentage terms in regions with the highest absolute values than in those with the lowest ones. At the same time, in 2021 the decline in the richest regions was more pronounced, returning to 2017 levels, while in the lowest-income regions the reduction was more limited.

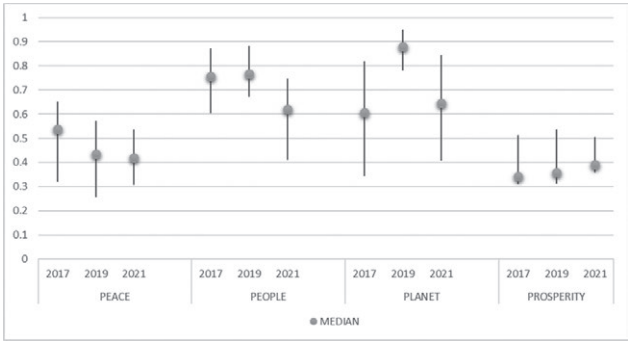

Figure 4. Range values and median of the Ps Indices.

On the Social side, the indicators did not change significantly, except for the ones linked to waste management ('Transfer of urban waste to landfills'; 'Separate collection of urban waste') where there was an improvement in 2017, with some differences among the regions, and then a worsening, generalized only for the separate collection of the urban waste. In the technologies sub-dimension the values of the criterion 'Firms with innovative product and/or process activities (per 100 firms)' highlighted a huge reduction in 2021, which was almost present in almost all the regions. In particular, the reduction hit deeply the regions with a previous high level of innovation.

In conclusion, the trend of the Global index seemed to be influenced first by the performance of the Planet dimension but also of People for 2019 while in 2021 all the indices contributed to the drops of the performance, with particular regard for People. In general, we found a very low interaction between the four P over the three years. Only positive weak correlations were found: the strongest, although weak, was between Peace and Planet dimensions.

3.2.1 The geographical repartitions of Ps Indices

To deepen the analysis, we considered the evolution of the 4 Ps indices in the different regions, grouped into the three geographical repartitions. Figures 5 to 7 show the evolution across the three years of the 4 Ps indices, stacked one on top of the other, one for each geographical repartition of north, central, and south Italy. In northern Italy (Figure 5) the general trend, first positive or stable (from 2017 to 2019) and then negative (2021) is clearly visible and this could be probably due mostly to the trend of the dimension Planet, which is positive from 2017 to 2019 and negative from 2019 to 2021, maintaining in any case a higher level in 2021 than in 2017. As mentioned in the previous paragraph, this trend within Planet could be due

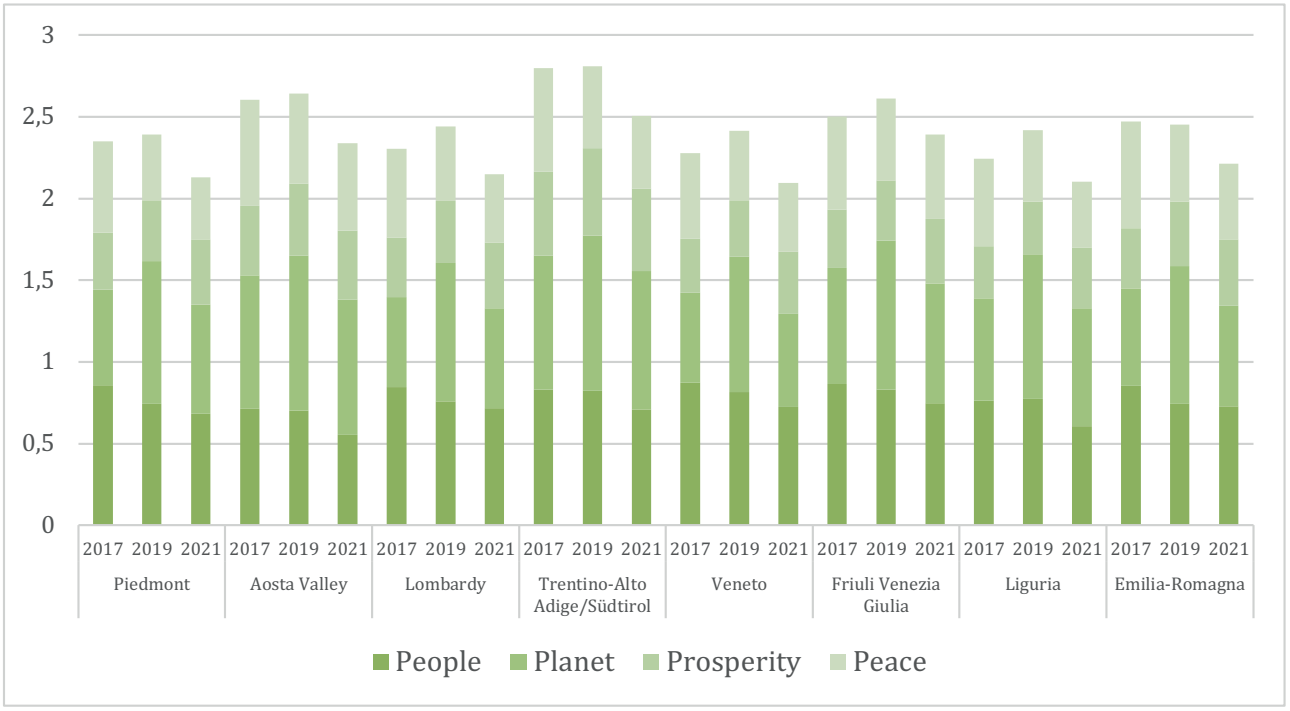

Figure 5. Bar of sustainability – Northern Italy (2017-2019-2021).

to some of the indicators that before had an improvement ('Forest fire impact', 'Illegal building' and 'Emissions of PM10'), while some of them had a sensible drop in 2021 (in the north 'Emissions of PM10' and 'Percentage of people living in homes with structural problems or humidity problems'). The PM10 emissions were generally higher in the northern area (except for Liguria and Trentino), due to the presence of many industrial sites and the geographical conformation of the territory. On the contrary, the data related to illegal building were always best for the north and worst for the south of Italy.

At the same time, Peace and People followed a different direction for almost all the regions, showing a continuous decline over the years to which only two regions narrowly escape: Liguria (with a slight increase in People between 2017 and 2019) and Friuli Venezia Giulia (with a slight increase in Peace between 2019 and 2021). For the Peace dimension, the two criteria 'Percentage of permits issued for political asylum and humanitarian reasons' and 'Crowding of prisons' were the main cause of the worsening in 2019, while in 2021 there was a general deterioration of the 'Ratio between the employment rates (25-49 years) of women with children and women without children' which was balanced by the improvement of other indicators including the relevant one of 'Crowding of prisons'. The northern regions maintained over the years the best performances in terms of 'Irregularly employed' and 'Duration of civil proceedings'. The worsening for the People dimension was mainly linked to two criteria, 'Overburden of the cost of housing' and 'Annual growth rate of real GDP per inhabitant'; between 2019 and 2021 also 'Risk of poverty or social exclusion' worsened. Moreover, although the criteria for the quality of life were generally good in northern Italy, this geographical area resulted to be the tail light for the 'Persons aged 14 and over with risk behaviour for alcohol'. Although it is not possible to declare a causality linked to the pandemic event, it is possible to say that between 2019 and 2021 some indicators linked to equality or social vulnerability worsened.

The Prosperity dimension was the most stable, although with a positive trend, with the exception of Trentino Alto Adige and Friuli Venezia Giulia, whose index decreased from 2019 to 2021. Generally speaking, all northern regions performed well considering most of the criteria, however for 'Public institutions that adopt forms of social and/or environmental reporting' and 'Electricity from renewable sources' the behaviour was very variable and the area included both the best and the worst regions at the same time.

Considering all the 4 Ps, none of the regions came back to the sustainability level shown in 2017. Moreover, Emilia Romagna is the only region that showed a negative global trend also in 2019, although the difference

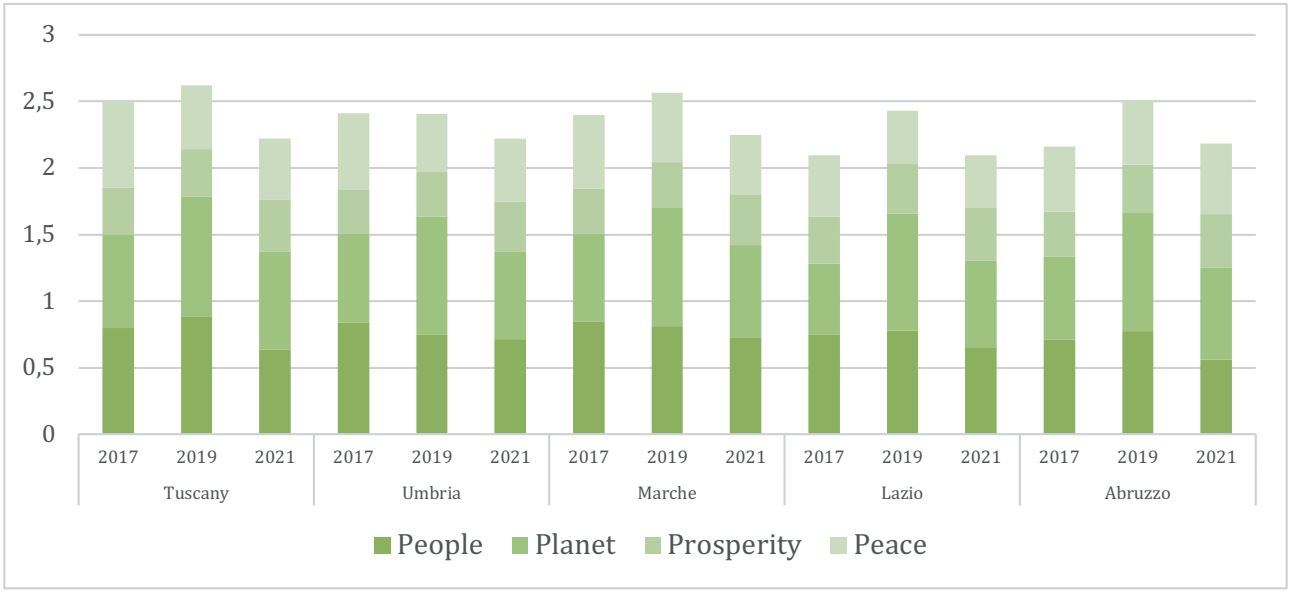

Figure 6. Bars of sustainability – Central Italy (2017-2019-2021).

with 2017 was slight. This result was due to the lowering of both People and Peace; Planet increased in 2019 for this region, however, it could not compensate the decrease of the other two dimensions. The two highly ranked regions (Valle d'Aosta and Trentino Alto Adige) did not improve significantly between 2017 and 2019, although, as for the other regions, the good performance of Planet.

In the central Italy (Figure 6) all the regions, except for Umbria, which was rather stable, presented a positive global trend from 2017 to 2019, due to the high increase in the Planet dimension, especially for 'Forest fire impact' and in particular for Lazio region. Peace and People almost presented a negative trend (with the exception of Tuscany and Lazio for People), while Prosperity remained stable, although with a positive trend. Also for this geographical division, the decrease recorded in 2019 in Peace was due to the worsening of the indicators 'Percentage of permits issued for political asylum and humanitarian reasons' and 'Crowding of prisons', such as for the Northern area.

In 2021 a worsening affected all the regions, which reached a total value lower than in the first year considered, with the sole exception of Lazio, which returned to the 2017 level. All the dimensions decreased in 2021 with the exception of Prosperity, which presented stable or higher values in comparison to both 2017 and 2019. For Prosperity, the better position was mainly linked to three criteria: 'Families with a fixed and/or mobile broadband connection', 'Firms with innovative product and/or process activities (per 100 firms)', and 'Energy intensity'. However, the classification reached for Prosperity in 2021 by the Central regions corresponded to a Low or very Low Class: only Lazio ranked as the medium. Although this classification is in line with the previous two for the area, it is to note a worsening of the Tuscany results.

The trend among the southern regions (Figure 7) is similar to the ones already seen, although the enhancement of the performance between 2017 and 2019 was stronger than in the other geographical areas. Looking at the singular dimensions, the biggest contribution to this raise was due to the great increase of Planet (for the indicators already mentioned above, in particular for the south 'Forest fire impact'), and to a moderate one of People. In particular, in the People dimension, three criteria improved between the two years ('Unemployment rate', 'Young people who do not work and do not study (NEET 15-24 years)', 'Annual growth rate of real GDP per inhabitant'). To note in such a dimension, the bad performance in two lifestyle criteria, 'Excess weight among children aged 3 to 17 years' and 'Healthy life expectancy at birth', which were always among the worst in comparison to the other geographic areas and also worsening in the considering period. Again, Peace and Prosperity were more stable, although some regions acted differently. For instance, if we consider Peace, Calabria was more stable between 2017 and 2019 and made progress between 2019 and 2021 (due to the improvement of 'Women and political representation at the local level' and 'Number of victims of intentional homicide'), although remained in the

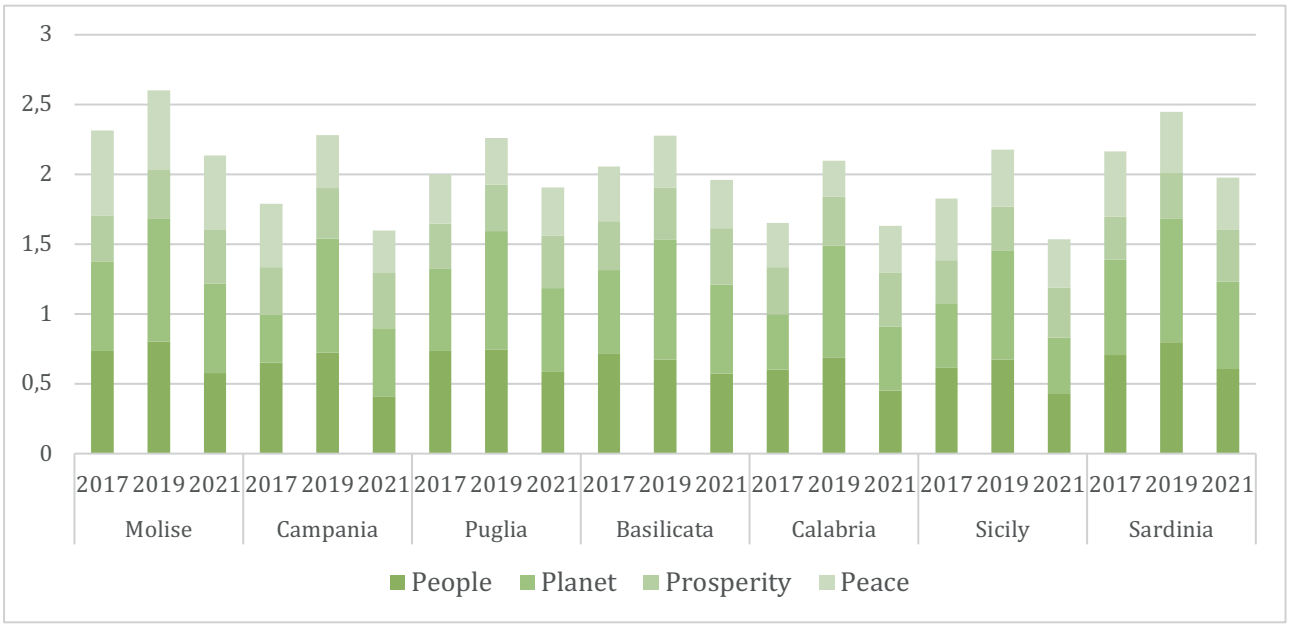

Figure 7. Bars of sustainability – Southern Italy (2017-2019-2021).

worst group, while Campania region constantly obtained worse performances (mainly caused by the worsening of 'Anti-violence centers and shelters rate per 100,000 women > 14 years old' and 'Percentage of permits issued for political asylum and humanitarian reasons') changing from Medium in 2017 to Very Low in 2021. In general, the southern regions maintained over the years the worst performances in terms of 'Irregularly employed' and 'Duration of civil proceedings'. In 2021 Abruzzo and Molise stand out compared to the other southern regions because of their good performances regarding several indicators: 'Anti-violence centers and shelters rate per 100,000 women > 14 years old', 'Percentage of permits issued for political asylum and humanitarian reasons', 'Ratio between the employment rates (25-49 years) of women with children and women without children', 'Number of victims of intentional homicide', 'Percentage of inmates awaiting first judgment out of the total inmates'.

This, along with the very bad results in Planet, caused a drop from the Medium class in 2019 to the Very Low class in 2021 in the Global index seen before. In comparison to the other areas, in the Southern the drop between 2019 and 2021 was greater in the People performance. The increase in the unemployment rate and the decrease in the GDP were the indicators that mostly affected these outcomes.

In general, looking at the results above discussed, it is possible to note a general common trend of the Planet dimension, which increased from 2017 to 2019 and then decreased in 2021, for all the Italian Regions. The Prosperity dimension was the most stable for the three years and all the geographical repartitions. The People and Peace dimensions did not have a global common trend, but followed different directions, depending on the single Regions. Moreover, although some general trends for homogenous geographical areas are present, there is great variability even within them. In order to make the comprehension of the results clear the maps of all the indices for all the years are provided as Appendix B.

Given the historical gap between the North and the South of Italy in terms of social and economic development, it is reasonable to expect the highlighted discrepancies when studying the sustainability performances between the different Italian territories. The origins of the regional gap between Northern and Southern Italy is one of the oldest and most controversial issues in Italian economics and politics (Daniele and Malanima, 2011; Felice, 2013; Russo 1991; Zamagni 1987). As explained in Federico G. et al. (2019), the existence of a North-South disparity and its evolution are inferred not only from the abundant anecdotal evidence on the backwardness of the South but also from the main economic data (e.g., GPD, real wages).

Although there are still few works that evaluated the sustainable development of Italian Regions in relation to Agenda 2030 or NSDS, the gap between the North and the South of the country was already made explicit (e.g.,

Alaimo and Maggino, 2019; D'Adamo et al., 2021; Ionescu et al. 2021; Pulselli et al., 2019). Alaimo and Maggino (2019) evaluated the sustainability of the Italian regions, focusing only on the first three Sustainable Development Goals. They selected 19 basic indicators, divided among the goals considered, in time series from 2009 to 2017. The selection of the indicators was influenced by the need to have data available at the regional disaggregation level. With their work, they wanted to emphasize not only how a gap actually exist between the North and the South of the country, but also how the synthesis tends often to be representative of situations profoundly different from each other, as a result of different values in the basic indicators, or similar situations between them (Alaimo and Maggino, 2019). Because of the different time frame and database used is not possible to make a comparison between their and our outcomes. However, the scenario described by their work is in line with the baseline scenario (2017) used in the present study. Our results are substantially aligned whit the findings of other existing work which show the differences between the various Italian regions. Looking at the 2021 assessment, in agreement with the observations of Ionescu et al. (2021), Abruzzo outperforms other Southern regions, while Lazio is the least performing among Central regions. The first position in the global sustainability ranking of Trentino Alto Adige confirms the results of D'Adamo et al. (2021) as well.

4. CONCLUSIONS

This paper was a first attempt to evaluate the early stages of the Italian Sustainable Development Strategy application, approved in 2017. In order to do so, it was decided to develop an evaluation framework using the 5 Ps (Partnership, Peace, People, Planet, Prosperity) into which the national strategy is divided, based on the 2030 agenda. Because of the absence of data, one of them, Partnership, was excluded. The resulting integrated system of indicators has been built by choosing the regional level, to have a medium-scale analysis; four indices, one for each P, plus a Global one were computed. Three reference years were chosen: 2017, which being the year of approval itself can be considered as a benchmark; 2019 to assess the initial momentum; 2021 representing the short-term effects of the pandemic event COVID-19.

The analysis carried out with SSAM, an integrated multicriteria analysis tool in a geographic environment, showed how the implementation of the strategy generated positive effects on the level of sustainable development of the Italian regions. However, these effects were not uniform and mainly concerned environmental aspects (Planet Dimension) followed by human well-being (People Dimension). The positive trend noted in 2019 was interrupted and even reversed in 2021, materializing the short-term effects of the pandemic from COVID-19, which strongly affected all the areas and all the dimensions, pushing back the sustainable development level of the Italian regions. As expected, the Sustainability level of the Northern regions was higher than that of the Southern ones, although the differences were not always pronounced. Considering the three years, the distance between the North and South changed significantly, and overall, COVID-19 seemed to have affected most the level of sustainable development in the south. In policy perspective, limiting the analysis and monitoring of the strategy to the national level is a very weak approach, because of the high level of internal socio-economic and territorial diversity of Italy. The differences in regional performances should be considered at the national level to better address the funding distribution among the regions in specific areas, for instance the ones connected to healthcare for improving the quality in the South. At the same time, Regional Decision Makers, on the ground of their relative results can learn how to better prioritize their sustainable strategy, to be tailored to the territorial needs. Political context matters and hence, in-depth engagement with the history of the territory is necessary to understand how to address targets. For example, our work has shown that the historical gap present between the North and the South is still present and is reinforced even in the post-pandemic when looking at income-related indicators, for example. The absence of a general direction for the areas People and Peace requires regional-specific actions, focusing specifically on the local weak points. Optimally, evaluative and technical support and policy initiatives should act jointly to set local targets that ensure both consistency with the national plan and the correct impetus in local reality.

Given the wide scope of the National Strategy, this assessment does not aim to be exhaustive, but it is intended to be an initial analytical tool for public decision-makers, especially to understand in which areas there have been the biggest setbacks due to the pandemic, or in which areas there has been a greater effect of the pandemic, or conversely a better ability to counter negative trends. The main strength of the proposed framework is the easy readability of the results, thanks to the GIS support, which can be very helpful for monitoring the effect of a crucial strategy for Italy. The short available reference period does not allow to gather a clear direction. Further monitoring should be run, at least

once every two years, in order to trace trends and, at the same time, to have the opportunity to speed them up or to slow them done for continuous policy action.

Despite the theoretical soundness of the work, there are some limitations mainly related to the availability and the possibility to update the data used to construct the indicators. Indeed, the coverage of data availability is uneven among the four P's used as assessment dimensions. In particular, Planet appears to be the dimension in which timely updating is most difficult. The absence of updated data makes the role of the always-updated criteria more crucial to the assessments; moreover, the absence of a suitable update resulted in the exclusion of some criteria that would have been useful instead in assessing Planet. Moreover, due also to the limitation in data availability, some goals had to be excluded, more precisely: Goals 6 (Clean water and sanitation), 14 (Life below water), and 17 (Partnerships for the goals). The exclusion in particular of the first one maybe gives a not complete picture of the differences between regions, considering the structural infrastructure problems present in Southern Italy. Finally, in order to have a more solid evaluation it should be useful to include at least ideal points quantitatively and grounded on policy indications. However, given the absence of clear quantitative targets for all the criteria, and in the presence of indications without a specific direction (e.g., decrease, increase, etc.), it was decided to base the analysis on the distribution of available data. Further development of the research can cover both the possibility to have a more complete set of indicators thanks to a better data quality, but also to include specific targets for each criterion, to have an absolute valuation of the achievement level instead of a relative one.

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APPENDIX A

Table 1. People indicators.

Goal	Indicator Code	NSSD Strategic Choice	National Strategic Objective	Selected indicator	Gain / Cost	Source	UM
1	PE_ POVERTY	Fight poverty and social exclusion by eliminating territorial gaps	Reduce the intensity of poverty	Risk of poverty or social exclusion	C	Istat	%
1	PE_WATER	Fight poverty and social exclusion by eliminating territorial gaps	Fight food and material deprivation	Families complaining of irregularities in the water supply	C	Istat	%
1	PE_HOUSE	Fight poverty and social exclusion by eliminating territorial gaps	Reduce housing deprivation	Overburden of the cost of housing	C	Istat	%
1	PE_LANDSL	Promote health and well-being	Reduce population exposure to anthropogenic and environmental risk	Population exposed to risk of landslides	C	Ispra	%
2	PE_OBESITY	Promote health and well-being	Promote healthy lifestyles and strengthen prevention healthcare systems	Excess weight among children aged 3 to 17 years	C	Istat	%
3	PE_LIFE	Promote health and well-being	Promote healthy lifestyles and strengthen prevention healthcare systems	Healthy life expectancy at birth	G	Istat	Average number of years
3	PE_SMOKE	Promote health and well-being	Promote healthy lifestyles and strengthen prevention healthcare systems	Smoking (Standardized Rates)	C	Istat	Standardized rates per 100 people
3	PE_BEDS	Promote health and well-being	Guarantee access to effective healthcare services and reduce territorial gaps	Beds in ordinary hospitalization in public and private healthcare institutions	G	Istat	every 10,000 inhabitants
3	PE_ALCOL	Ensuring the conditions for the development of human potential	Combat deviance through prevention and social integration of vulnerable individuals	Persons aged 14 and over with risk behavior for alcohol (Alcohol standardized rates)	C	Istat	Standardized rates per 100 people
4	PE_ABAND	Ensuring the conditions for the development of human potential	Reduce the school drop-out rate and enhance the education system	Early exit from the education and training system	C	Istat	%
4	PE_DEGREE	Ensuring the conditions for the development of human potential	Reduce unemployment for the weakest segments of the population	Graduates and other tertiary qualifications (ages 30-34)	G	Istat	%
8	PE_UNEMPL	Ensuring the conditions for the development of human potential	Reduce unemployment for the weakest segments of the population	Unemployment rate	C	Istat	%
8	PE_NEET	Ensuring the conditions for the development of human potential	Reduce unemployment for the weakest segments of the population	Young people who do not work and do not study (NEET 15-24 years)	C	Istat	%
8	PE_GDP	Ensuring the conditions for the development of human potential	Ensure the effectiveness of social protection and security system	Annual growth rate of real GDP per inhabitant	G	Istat	%

Table 2. Planet Indicators.

Goal	Indicator Code	NSSD Strategic Choice	National Strategic Objective	Selected indicator	Gain / Cost	Source	UM
10	PL_ PROBLEM	Create resilient communities and territories, protect landscapes and cultural heritage	Guarantee high environmental performances of buildings, infrastructures and open spaces	Percentage of people living in homes with structural problems or humidity problems	C	Istat	%
11	PL_ ILLEGAL	Create resilient communities and territories, protect landscapes and cultural heritage	Prevent anthropogenic and environmental risk and strengthen urban and territorial resilience	Illegal building	C	Center for economic and social market research for construction and the territory (Cresme)	For 100 licensed constructions
11	PL_PM10	Ensure the sustainable management of natural resources	Minimize emissions and reduce air pollutants concentration	Exceeding the daily limit value set for PM10 in provincial capitals/ metropolitan cities	C	Istat	No. of days
11	PL_ GREEN	Create resilient communities and territories, protect landscapes and cultural heritage	Boost urban regeneration, ensure sustainable urban accessibility and mobility	Incidence of urban green areas on the urbanized surface of cities	G	Istat	m^2 per 100 m^2 of urbanized area
13	PL_FIRE	Create resilient communities and territories, protect landscapes and cultural heritage	Prevent anthropogenic and environmental risk and strengthen urban and territorial resilience	Forest fire impact	C	Istat	For 1,000 km^2
15	PL_ PROTECT	Halt the loss of biodiversity	Increase terrestrial and maritime protected areas and ensure their effective management	Protected areas	G	Istat	%
15	PL_ WPROOF	Ensure the sustainable management of natural resources	Ensure sustainable forest management and combat forest abandonment and degradation	Soil waterproofing by artificial cover	C	Ispra	%
15	PL_ FRAGM	Create resilient communities and territories, protect landscapes and cultural heritage	Ensure ecosystems restoration and defragmentation, strengthen ecological urban/rural connections	Fragmentation index of the natural and agricultural territory	C	Ispra	%

Table 3. Prosperity Indicators

Goal	Indicator Code	NSSD Strategic Choice	National Strategic Objective	Selected indicator	Gain / Cost	Source	UM
1	PR_ TRANSP	Decarbonize the economy	Increase sustainable mobility of people and goods	Families declaring difficulties in connecting with public transport in the area where they live	C	Istat	%
1	PR_BAND	Fund and promote sustainable research and innovation	Implement the digital agenda and improve the spread of smart networks	Families with a fixed and/ or mobile broadband connection	G	Istat	%
1	PR_ LANDF	Ensure sustainable production and consumption patterns	Dematerialize the economy, improving the efficient use of resources and the circular economy	Transfer of urban waste to landfills	C	Ispra	%
2	PR_ ORGANIC	Ensure sustainable production and consumption patterns	Boost sustainable farming and forestry throughout the production and supply chain	Share of utilized agricultural area (UAA) covered by organic crops	G	Ministry of Agricultural, Food and Forestry Policies	%
4	PR_ EDUCAT	Ensure full employment and high quality training	Ensure accessible, high quality and permanent training	Participation in continuing education	G	Istat	%
7	PR_ RENEW	Decarbonize the economy	Increase energy efficiency and renewable energy production, avoiding or reducing impacts on natural and cultural heritage and the landscape	Electricity from renewable sources	G	GSE SpA – Energy Services Manager	%
7	PR_ ENERINT	Decarbonize the economy	Increase energy efficiency and renewable energy production, avoiding or reducing impacts on natural and cultural heritage and the landscape	Energy intensity	C	Enea	Tons of oil equivalent (TOE) per million euro
9	PR_ RESEARC	Fund and promote sustainable research and innovation	Increase the investments in research and development	Research intensity	G	Istat	%
9	PR_ INNOV	Fund and promote sustainable research and innovation	Innovate processes and products and promote technological transfer	Firms with innovative product and/or process activities (per 100 firms)	G	Istat	%
10	PR_ INCOME	Ensure full employment and high-quality training	Increase sustainable and high-quality employment	Gross disposable income per capita	G	Istat	Euros (current prices)
12	PR_ RECYCL	Ensure sustainable production and consumption patterns	Dematerialize the economy, improving the efficient use of resources and circular economy	Separate collection of urban waste	G	Ispra	%
12	PR_EMAS	Ensure sustainable production and consumption patterns	Promote social and environmental responsibility in companies and institutions	Number of EMAS registered organizations/ companies	G	Ispra, Istat	Every 1,000 active enterprises
12	PR_ REPORT	Ensure sustainable production and consumption patterns	Promote social and environmental responsibility in companies and institutions	Public institutions that adopt forms of social and/or environmental reporting	G	Istat	%
12	PR_ TWASTE	Ensure sustainable production and consumption patterns	Promote the demand and increase the supply of sustainable tourism	Impact of tourism on waste	C	Ispra	kg per inhabitant equivalent
12	PR_ TOURIN	Ensure sustainable production and consumption patterns	Promote the demand and increase the supply of sustainable tourism	Tourism intensity index	G	Istat	Per 1,000 inhabitants

Table 4. Peace Indicators.

Goal	Indicator Code	SnSvS Strategic Choice	National Strategic Objective	Selected indicator	Gain / Cost	Source	UM
5	PA_ANTIV	Promote a non-violent and inclusive society	Prevent violence against women and children and provide adequate assistance to victims	Anti-violence centers and shelters rate per 100,000 women > 14 years old	G	Istat	Per 100,000 women
5	PA_EMPLW	End discrimination in all its forms	Guarantee gender equality	Ratio between the employment rates (25-49 years) of women with children and women without children	G	Istat	%
5	PA_REPRESW	End discrimination in all its forms	Guarantee gender equality	Women and political representation at the local level	G	Individual regional councils	%
8	PA_IRREMPL	End discrimination in all its forms	End all forms of labour exploitation and ensure workers' rights	Irregularly employed	C	Istat	%
10	PA_PERMIT	Promote a non-violent and inclusive society	Guarantee migrants' and asylum seekers' reception and the full integration of ethnic and religious minorities	Percentage of permits issued for political asylum and humanitarian reasons	G	Istat	%
16	PA_HOMICID	Ensure legality and justice	Reinforce the fight against crime	Number of victims of intentional homicide	C	Ministry of the Interior	Per 100,000 inhabitants
16	PA_SAFETY	Ensure legality and justice	Reinforce the fight against crime	Perception of safety walking alone in the dark	G	Istat	%
16	PA_JUDGE	Ensure legality and justice	Ensure just and efficient judiciary system	Percentage of inmates awaiting first judgment out of the total inmates	C	Ministry of Justice – Department of prison administration	%
16	PA_PRISONS	Ensure legality and justice	Ensure just and efficient judiciary system	Crowding of prisons	C	Istat	%
16	PA_CIVPRO	Ensure legality and justice	Ensure just and efficient judiciary system	Duration of civil proceedings	C	Ministry of Justice	No. of days

APPENDIX B

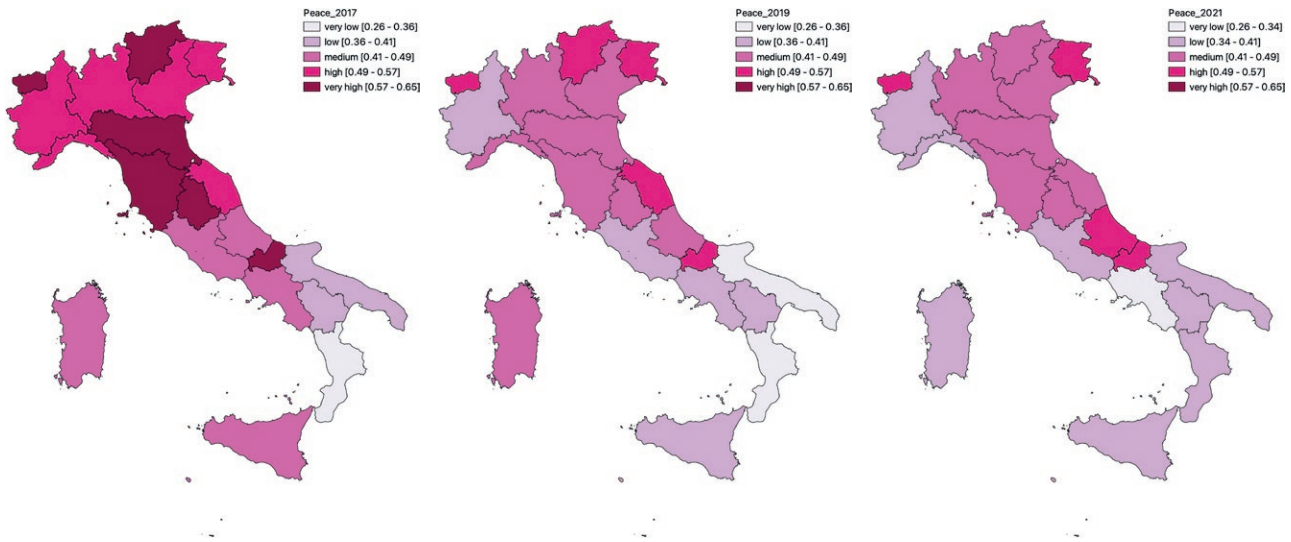

Figure 8. Regional distribution of the Peace index (years: 2017, 2019, 2021).

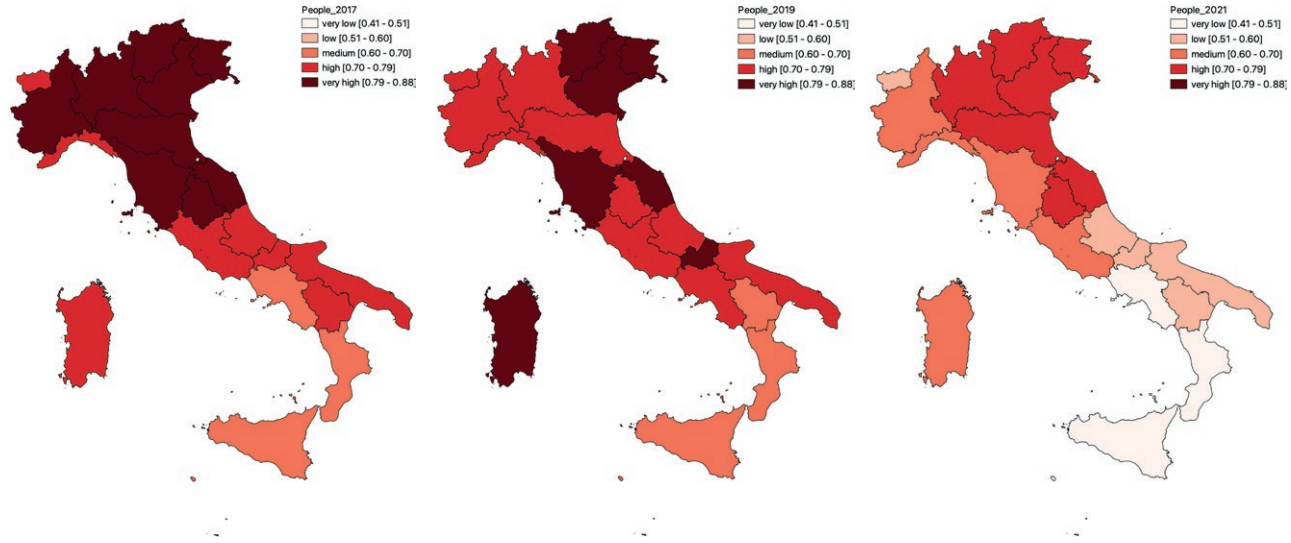

Figure 9. Regional distribution of the People index (years: 2017, 2019, 2021).

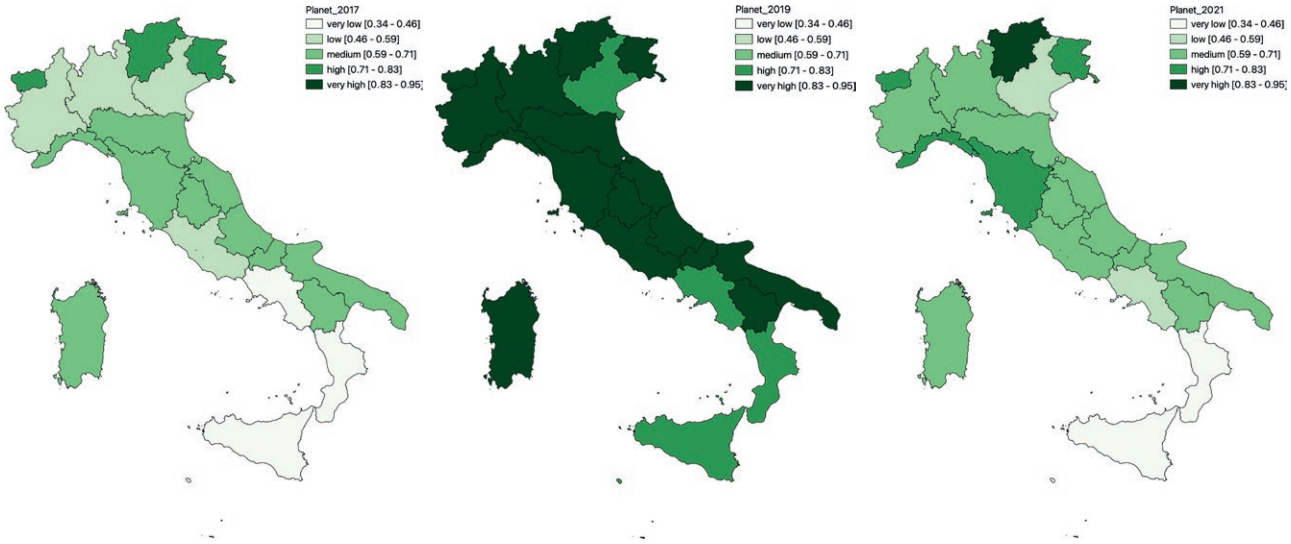

Figure 10. Regional distribution of the Planet index (years: 2017, 2019, 2021).

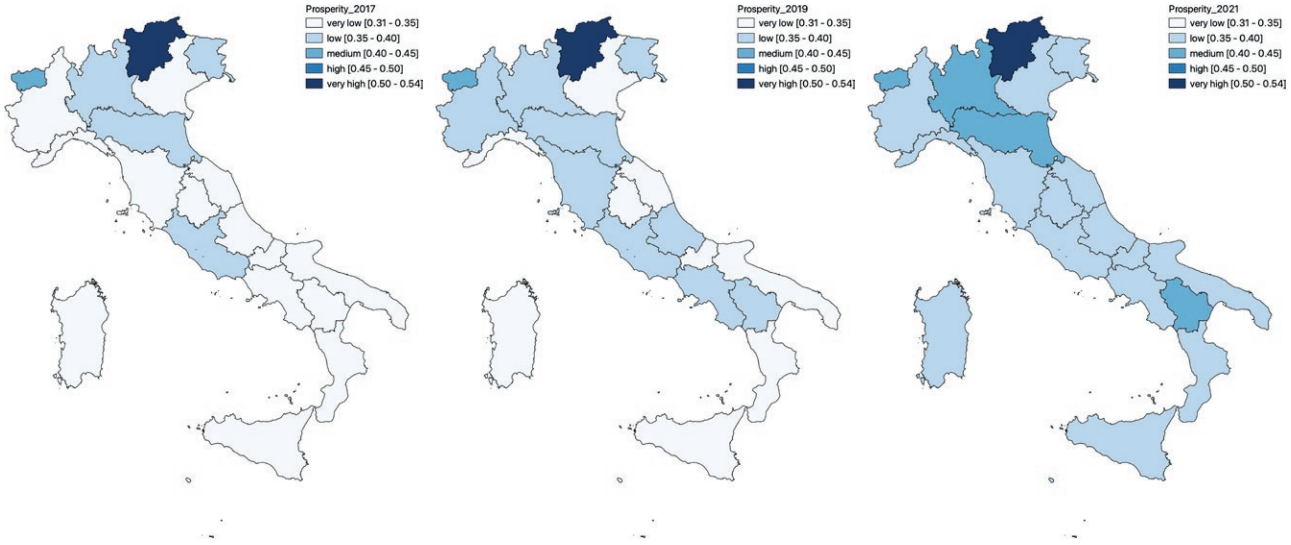

Figure 11. Regional distribution of the Prosperity index (years: 2017, 2019, 2021).

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ORCID:
MdA: 0000-0002-6719-9056
GC: 0000-0002-4627-300X
GB: 0000-0001-5748-8746

Appraising forced sale value by the method of short table market comparison approach

Maurizio d'Amato[1,*], Giuseppe Cucuzza[2], Giampiero Bambagioni[3]

[1] *Department of Civil, Environmental, Land, Construction and Chemistry (DICATECh), Polytechnic University of Bari, Italy*
[2] *Department of Agriculture, Food and Environment (Di3A), University of Catania, Italy*
[3] *Faculty of Architecture, Sapienza University of Rome, Italy*
E-mail: maurizio.damato@poliba.it, giuseppe.cucuzza@unict.it, giampiero.bambagioni@uniroma1.it
*Corresponding author

Abstract. For International Valuation Standards (IVS) the estimate of the "forced sale" value implies a value judgment with reference to a degeneration of the market value basis, since "a forced sale" is a description of the situation in which the exchange takes place, not a distinct basis of value (IVS 2022, Par. 170.1).The paper illustrates a model that can be used to measure the difference between market value and forced sale value, as an aid to real estate valuations related to real estate executions. The proposed method is aimed at determining the difference between the estimated values and the final sales values obtained through the executive process, on the basis of the Short Table Market Comparison Approach (MCA). This method contributes more appropriately to the estimate of the value obtainable from the outcome of the enforcement process than arbitrary reductions in the market value. An application on a small sample of residential properties undergoing enforcement procedure highlights the possibility of using the Short Table MCA even with a limited number of comparables.

Keywords: market approach, short table market comparison approach, forced sale value, intrinsic value, auctions.
JEL codes: D84, K25, K49, R31.

1. INTRODUCTION

Valuation of forced value using short table market comparison approach (MCA) is a valuation procedure to extract the estimation function from a sample of limited number of comparables. In judicial procedures, as a result of the forced sale process, it is frequent not to obtain the market value from the sale of properties. The definition of market value[1] proposed by the Regulation (EU)

[1] Market Value means « *for the purposes of immovable property, the estimated amount for which the property should exchange on the date of valuation between a willing buyer and a willing seller in an "arm's-length transaction after a proper marketing wherein the parties had each acted knowledgeably,*

No 575/2013 implies the existence of specific conditions including the possibility of an "adequate commercial promotion", as well as the existence of the assumption that both parties act "with knowledge of the facts, with prudence and without being subject to constraints".

Anyway, the short temporal horizon in which the forced sale of the property should take place may be in contrast with a sustainable value in the long term (Bambagioni, 2021). In December 2015 Bank of Italy updated Circular n. 272/2008[2] on non-performing financial assets based on the exposure subject to concessions (forbearance), as defined by the Implementing Technical Standards (ITS), which distinguish them in: (*i*) exposures subject to impaired concessions, which correspond to the "non-performing exposures with forbearance measures"; (*ii*) other exposures subject to concessions, corresponding to the "Forborne Performing Exposures". The proposed model tries to determine a price additive function for the property to be valued. Previous applications of this model (d'Amato, 2015a; d'Amato, 2015b) have been applied to the value of the property after an urban transformation. Estimation function allowed the determination of a location variable in the specific market segment and the quantification of other *inaestimabilis* variables determining a unique marginal price for all the variables considered. In this paper we propose the application of the short tab market comparison approach to estimation of forced value. For its determination "the valuer will have to take into account a limitation to current or expected marketability; in this case, the value is connected to specific assumptions that the valuer must indicate in the Valuation Report" (Tecnoborsa, 2018). Forced sale value (sometimes also defined as "judicial value") is a "degeneration" of the well-known and fundamental basis of market value since "A "forced sale" is a description of the situation under which the exchange takes place, not a distinct basis of value" (IVS 2022, Par. 170.1). Furthermore, the forced sale value must be distinguished from the liquidation value, although the proposed model can be applied in both cases. The forced sale value shows a certain decrease in time on market representing a fundamental characteristic of this degeneration of market value. This is in contrast with the pure definition of market value which states that is based on "an adequate commercial promotion" (Article 4 para 1 point 76 EU Regulation 575/2013 and Italian Property Valuation Standard 2018, Chapter 3 par. 2.2). Time on Market in forced value are necessarily short because it is a sum "obtainable from the sale of the property in the event that, for whatever reason, the seller is forced to sell the property" (Bambagioni and Simonotti, 2018, Chapter 3 Para. 2.13). In the liquidation value, although there is a necessary sale, it cannot be excluded that "The individual assets can be sold with a regular sale, that follows a marketing activity" (Tecnoborsa, 2018). In fact, IVS 2022 identify the liquidation value as "the amount that would be realized when an asset or group of assets is sold in a fractional manner". It must "take into account the costs of selling the assets and those of the divestment activity. Liquidation value can be determined on the basis of two different value assumptions: (*a*) an ordered transaction with typical marketing period; (*b*) a forced transaction with a reduced time period usable for marketing" (IVSC 2022, IVS 104, Basis of Value, section 80). Numerous papers have highlighted the dimension of the discount – intended as a reduction of market value – as an incentive for a quick sale (Forgey et al., 1994; Hardin and Wolverton, 1996; Shilling et al., 1990). Determination of the forced value was a subject of several contributions. Knight et al. (1994) have highlighted how the decrease in price tends to increase the number of potential participants and to decrease the amount of the offer. An application of multiple regression analysis was proposed to study Australian case based on the basis of a massive amount of data. In this case the dependent variable was the price at the end of liquidation procedure and the independent variables were: size of the property, age of the building, number of services, location, maintenance, construction characteristics, date of sale and type of market (Lusht, 1996). In Australian case, normally the price is higher than the other property markets. The reason proposed by Lusht (1996) was the dimension of the market which at the time of the article represented almost half of the entire real estate sector. Further studies used large quantities of properties considering as independent variables characteristics like age, construction typology, size quality of finishes, location type of market and the rate of interest of the loan at the time of valuation (Dotzour, 1998). Mayer (2003), Marcus (2001) and Quan (2002) confirmed the conclusions of previous studies showing the differences between the competitive market and auction market. Allen and Swisher (2000) analysing a sample of properties sold at auction in Fort Lauderdale found an inverse relationship between the price and the time on market. Campbell et al. (2011) carry out a study on a very large sample of 1.8 million properties sold at auction in Massachusetts in the last 20 years, finding that the average discount is 28% com-

prudently and without being under compulsion» ((Regulation (EU) No 575/2013 of 26 June 2013, on prudential requirements for credit institutions and investment firms […], art. 4 (Definitions), paragraph 1, point 76)).

[2] Banca d'Italia – Eurosistema, Vigilanza bancaria e finanziaria – Matrice dei Conti, Circolare n. 272 del 30 luglio 2008 – 10th update (document available in the website https://www.bancaditalia.it)

pared to the market value of the same properties in the corresponding market segment. The work highlights also the dynamic nature of the location variable and the role of maintenance. Both conclusions will inspire the short table model. The relationship between sales mechanism on local customs and laws and has been explored by Pennington-Cross (2006). The role of Banks Institution have been highlighted by a subsequent study (Donner, 2017). Susilawati and Lin (2006) conducted an interesting study on the auction markets, discovering meaningful differences compared to other markets. In Australia and Ireland the auction led to an increase in the initially estimated value whilst in the opposite happens in Taiwan and Singapore. A negative influence on the price of subsequent auctions was highlighted together with the influence of the nature of the special properties (Ong, 2006). Hungria-Gunnelin (2013) considered the role of the number of bidders and their influence on auction sales. The increase in bidders positively influences price discovery. Wong et al. (2015) showed that typical auction variables such as proximity to the center or the number of online visitors or even unsuccessful auction attempts are positively correlated with the sale price and relative probability of sale. The role of physical conditions in price discovery was also highlighted by Clauretie and Daneschvary (2009); they found this attribute very important together with time of sale to determine discount on properties sold at auction. The importance of physical characteristics have been emphasized as determinant of value in several contributions (Carroll et al., 1997; Forgey et al., 1994; Hardin and Wolverton, 1996; Shilling et al., 1990). Further studies focused on the nature of the asset (Donner et al., 2016; Donner, 2017). An interesting conceptual review was carried out (Renigied-Bilozor et al., 2018), while more recently the use of multiple regression models was proposed for the Italian reality (Amoruso et al., 2020; d'Amato and Kauko, 2009; d'Amato and Siniak, 2009; Di Liddo et al., 2022). The contribution is organized as follows: (*i*) description of some general aspects relating to the appraisal in real estate auctions; (*ii*) formal presentation of the model, based on additive form of the price function normally considered in the application of Market Comparison Approach (*iii*) an application of the model to a concrete case study; (*iv*) final remarks and future directions of research.

2. REGULATORY REFERENCES AND APPRAISAL OF ASSETS SUBJECT TO REAL ESTATE EXECUTIONS IN ITALY

In the Italian legal framework of real estate executions, aimed at auctioning the property covered by the mortgage loan guarantee, the appraiser acts as an "appraisal consultant" and auxiliary to the judge delegated to the executive procedure. Appraiser cooperates with the judge together with the other figures appointed as auxiliaries like judicial custodians, bankruptcy trustees, judicial administrators, sales delegates and finally the creditor and the debtor as well as potential buyers. The role of appraiser is strategic along the procedural process, both in terms of reducing information asymmetries and uncertainties, which could be feared in the context of real estate executions. A further effect may be also reducing time on market, reducing procedural cost and efficient allocation of the properties (Borella et al., 2019; 2020). The reform introduced in 2015[3] aimed at reducing both the procedural process and the cost associated with its performance, which can be achieved through the formulation of an appropriate valuation based on accurate and transparent methodologies in compliance with International Valuation Standards. The reduction of time on market of property subject to execution is explicitly required in the "Guidelines on Best Practice in the Sector of Real Estate Executions" issued by Superior Council of the Judiciary (Consiglio Superiore della Magistratura) in 2017 and updated in 2019, hereinafter "CSM Consiglio Superiore della Magistratura Guidelines". Forced execution for real estate expropriation *"must, in fact, take place according to criteria of efficiency, effectiveness and speed in order to liquidate the assets of the debtor's assets, achieving the maximum proceeds – to be allocated to creditors and, in a residual way, to the executed debtor – in the shortest possible time"* (Consiglio Superiore della Magistratura, 2017). Appropriate valuation contributes to the pursuit of the objectives underlying the real estate execution procedure as it also allows potential buyers to adequately make known the technical, economic and legal characteristics of the property in auction. Conversely, scarce information, generic and partially documented or approximate property valuation may prevent buyers from the participation to auction process with the consequent increase in time and costs which is considered desirable to contain. The opinion of value provided in the context of real estate executions must therefore necessarily meet the requirements of correctness and reliability, which are decisive for offering those elements necessary for the economic and social benefits to be pursued, which appear consistent not only with Italian legislation but also International Standards. It is possible to report, among the others:

[3]Law 6 August 2015, n. 132, Conversion into law, with amendments, of the decree-law 27 June 2015, n. 83, containing urgent measures in bankruptcy, civil and civil procedural matters and the organization and functioning of the judicial administration

(*i*) International Valuation Standards (IVS, 2022); (*ii*) Guidance to banks on non-performing loans adopted by the European Central Bank (ECB, March 2017)[4]; (*iii*) Italian Property Valuation Standard[5] (Chapter 15 – Valuation of Properties as Collateral for Non-Performing Loans, NPL); (*iv*) Guidelines for the Evaluation of Properties as Collateral for Bad Loans promoted by the Italian Banking Association (ABI, 2018)[6] together with the National Councils of Technical Professions, as well as Consiglio Superiore della Magistratura Guidelines, previously quoted. An efficient and transparent valuation report also allows an useful estimate of value available not only for the efficiency of trial activity, but in broader sense to make more transparent real estate markets (Burti, 2020). A robust appraisal that allows to identify a reasonable value achievable in the auction, may limits the time of real estate execution reducing associate costs like the advertising communication. It also activates a virtuous stimulating a greater presence of different operators in the auctions, contain the risks of exposure to a prolonged debt position, diminish the uncertainties resulting from deleterious mechanism of adverse selection from part of possible speculators (Mottadelli and Ponti, 2016). Identifying an appropriate appraisal value of the asset subject to real estate expropriation is therefore very important for the procedural process. Anyway, it is a matter of fact that the selling of the asset does not occur in a free negotiation, but in the context of a procedural path in which the selling party may not be consenting. For this reason hidden defects cannot be completely excluded.

Although it is understandable that selling at a higher price means a higher revenue for the creditor, in this kind of valuation report a cautious and prudential determination of value lower than market value is plausible and shared. Italian legislation provide specific recommendation on this, the new legislation promulgated in 2015 reports and interesting part at the art.568 of Italian Code of Civil Procedure which states *"For the purpose of expropriation, the value of the property is determined by the judge having regard to the market value on the basis of the elements provided by the parties and by the expert appointed pursuant to article 569, first paragraph. In determining the market value, the expert calculates the area of the property, specifying the commercial area, the value per square meter and the total value, analytically indicating the adjustments and the correction of the estimate, including the reduction of the market value practiced for the absence of the guarantee for defects of the property sold, and specifying these adjustments separately for the urban planning regularization charged, the state of use and maintenance, the state of possession, the constraints and legal charges that cannot be eliminated in the course of expropriation procedure, as well as for any outstanding condominium expenses"*. In this legal framework, the appraisal value should provide a forecast of a possible reduction in the market value of the asset as if it were not burdened by an enforceable procedure. The reduction must be adequately justified and documented, rather than being determined in an approximate and arbitrary way on the basis of generic and superficial information, normally justified by expertise. This is an important task due to growing attention that courts pay to identify experts to be appointed as consultants, normally with specific qualifications recognized by third party certification bodies, but also in compliance with best practice used for the valuation of assets subject to real estate foreclosures. In this regards, the Italian Property Valuation Standard (Chapter 15, ed. 2018) takes into account the complexity of the conditions that characterize expropriation, the determination of value, the use of market value as a basis of value with assumptions and/or special assumptions to provide clear explanation of difference with the market value. These assumptions or special assumptions make possible to clarify the state of the asset in the hypothetical exchange, or in the circumstances in which it is assumed that can be exchanged (Tecnoborsa, 2018). National standards for real estate valuation also highlighted that *"the valuer can carry out a weighting/correlation among the properties subject to foreclosures procedures with other comparable properties subject to a foreclosure in the same area, and with other comparable properties subject to contracts in free markets, taking into account consideration of data and information inferable from market analysis"*. In the Guidelines published by Associazione Bancaria Italiana (2022) according to what is indicated in the European Valuation Standards (TEGOVA, 2020) referring to market value assumption it is also mentioned as "*that value of the immovable property to guarantee a bad credit estimated by the expert because of the limiting condition deriving from the execution or extrajudicial procedure, initiated for the recovery of the credit. In this case, the value is connected to specific assumptions that the expert must indicate in the valuation report*" (Associazione Bancaria Italiana, 2022). It is worth to notice how the Guidelines specifies that both the market value with assumption and the forced sale value do not constitute a basis of val-

[4] See ECB website: https://www.bankingsupervision.europa.eu/ecb/pub/pdf/guidance_on_npl.en.pdf

[5] *Ibidem*

[6] See ABI website: Linee Guida per la valutazione degli immobili a garanzia dei crediti inesigibili (2018) available at: https://www.abi.it/Pagine/Mercati/Crediti/Valutazioni-immobiliari/Linee-guida-valutazioni-immobiliari_crediti-inesigibili.aspx .

ue (Associazione Bancaria Italiana, 2022). In the property valuation process for enforcement procedures, being able to provide appraisal modelling which can be used objectively and effectively in line with the reliability and demonstrable requirements that are the basis for the preparation of an appropriate valuation, can be advantageous. In fact, an appropriate valuation model reduce the risk of a subjective and random value estimate providing economic and social implication derived from an increase in the effectiveness and efficiency of enforcement procedures.

3. ESTIMATE OF THE FORCED SALE VALUE WITH THE SHORT TABLE MARKET COMPARISON APPROACH (STMCA)

In this paragraph the foundation of the model proposed will be exposed together with the model of Market Comparison Approach Short Tab (stMCA). This particular kind of the model aim to determine an additive price function to analyse the specific market segment. Considering Vs as the estimated value and Vv as the value at which the asset is actually sold under the conditions of forced sale, the goal is to methodologically define the following difference reported in Equation 1:

$$\Delta = V_s - V_v \quad [1]$$

The difference between the indicated values is recurrently different from zero and in most cases it is positive because the value at which the asset is sold (Vv) is normally lower than the estimated one (Vs). The relationship indicated, in terms of the estimation function, can be modelled considering SUI, the main surface measured in square meters with a continuous cardinal scale, SUB, the balcony surface measured in square meters with a continuous cardinal scale, MAN, the maintenance status measured with ordinal variable to which to associate a distance function, Tcoll, as time on market measured with discrete cardinal variable as the number of months necessary to sell the property and On indicating tax to be paid for the sale, ordinal variable to which to associate a distance function. The whole is modelled as a difference of additive functions coherently with the methodological structure of the traditional MCA normally dubbed 1.0:

$$V_s - V_v = \overline{p}_{SUI}(SUI_S - SUI_V) + \overline{p}_{SUB}(SUB_S - SUB_V) + \overline{p}_{MAN}(MAN_S - MAN_V) + \overline{p}_{TColl}(Tcoll\_S - Tcoll_V) + \overline{p}_{FISC}(On_S - On_V) \quad [2]$$

where:

p_{SUI}, is the average price of the SUI feature, main surface;

p_{SUB}, is the average price of the SUB feature, balcony surface;

p_{MAN}, is the average price attributable to the characteristic representative of the maintenance status of the property;

p_{TColl}, is the average price of the characteristic that represents the time of placement (sale) of the asset on the market;

p_{FISC} is the average price of the feature that represents the main expenses related to the forced sale process.

In this case, since we are dealing with average prices, we are in the absence of localization variables; the difference in value would be explained not by the product between the average prices and the corresponding surface variables, but rather by the product between the status variables, which may present an actual variation over time, such as: maintenance status of the property, time of placement on the market and conditions of sale. While, in fact, during the execution of the executive procedure, in terms of surface or floor level there will be no change in the intensity of the characteristic, this will not happen for the other variables considered. A property subject to enforcement procedure may suffer, for example, a worsening of its maintenance conditions, with a difference in the variable in the asset that can also assume significant amounts between the estimated value (Vs) and the corresponding value at the time of sale (Vv) Similar considerations can also be developed for the variable relating to the timing of placement of the property involved in the executive procedure (TColl). The lengthening of the execution times with the final translation of the ownership of the asset, in fact, has an inversely proportional effect on the placement value of the asset in question (Vv). Finally, also the variable On, which represents the synthesis of all those main expenses related to the forced sale process are negatively affected by the changed conditions capable of affecting the value of the asset during the execution of the enforcement procedure. The relationship indicated can also be reformulated in terms of marginal prices:

$$V_s - V_v = (LOC_S - LOC_V) + p'_{SUI}(SUI_S - SUI_V) + p'_{SUB}(SUB_S - SUB_V) + p'_{MAN}(MAN_S - MAN_V) + p'_{TColl}(Tcoll\_S - Tcoll_V) + p'_{FISC}(On_S - On_V) \quad [3]$$

In member-to-member subtraction, the asset is compared with itself under different conditions of sale and time. It is therefore plausible that the localization variable is expressed in a differential measure between two

different "states of the world", which concern the context of the asset being valued. The reader will have grasped that the version of the MCA is founded on additive modelling of simple and logical application, a premise for every methodological application and foundation of the MCA (Isakson, 2002). It follows that, simplifying, the difference between the two values (Vs and Vv) can be explained as follows:

$$\Delta = (LOC_S - LOC_V) + p'_{MAN}(MAN_S - MAN_V) + p'_{TColl}(Tcoll\_S - Tcoll_V) + + p'_{FISC}(On_S - On_V) \quad [4]$$

Therefore, it follows that:

$$V_v = V_s + (LOC_S - LOC_V) + p'_{MAN}(MAN_S - MAN_V) - p'_{TColl}(Tcoll\_S - Tcoll_V) + p'_{FISC}(On_S - On_V) \quad [5]$$

This formulation leads to some operational implications, since, starting from the estimated value through the application of the MCA, it is possible to determine the forced sale value through the marginal prices of the relevant characteristics. However, the purpose of the short table MCA is not to determine the forced sale value, but the estimation function that defines it, in the presence of a relatively small number of comparables. The goal is therefore to have a model similar to a regression model, which can be determined with a very limited number of comparables. In fact, in the presence of a significant number of comparables, falling within the specific market segment, it is possible to apply other more effective market oriented methodologies, such as multiple regression analysis. However, in the short-table MCA the purpose is not the subtraction member by member of the values with which the relevant characteristics are manifested in the asset to be estimated and in the comparables, but the determination of an additive function that allows the formulation of value judgments of the asset, under certain "external" circumstances. In the context of executive procedures, the conditions that may promote the variation of these circumstances may be particularly evident. It therefore appears useful to proceed with the determination of a function that incorporates the natural variability associated with placement times, typical of executive procedures, together with the other determining variables previously mentioned and which can play a not negligible role in the variation between Vs and Vv. The goal, therefore, can be represented by the definition of a linear, additive function such as the following:

$$V_s = V_v \pm \delta LOC - p'_{MAN}MAN_V - p'_{TColl}Tcoll_V - p'_{FISC}On_V \quad [6]$$

or:

$$V_s - V_v = \pm \delta LOC - p'_{MAN}MAN_V - p'_{TColl}Tcoll_V - p'_{FISC}On_V \quad [7]$$

The term δLOC indicates the difference in the localization variable between the two states of the world at the time of evaluation and at the time of sale (Campbell et al., 2011). The weight of the variables that can be calculated using the marginal price theory (aka MCA 1.0) provide a first part of the estimation function. Other variables whose role cannot be neglected like the time on market (Tcoll) or location (LOC) or maintenance (MAN) or others inaestimabilis variables may be calculated associating an appraisal system (integrated appraisal system) to the traditional Market Comparison Approach. The approach is similar to the General Appraisal System of the traditional Market Comparison Approach 1.0.

4. AN EMPIRICAL VERIFICATION

In order to be able to validate the above from an application point of view, a concrete case study is shown below in which the estimation function was identified for determining the forced sale value. The procedure constructs short table MCA (stMCA) on the basis of the differences between the estimated value by expert (Vs) and the selling price of the executed assets in the same market segment or in nearby market segments. Therefore the function calculated may be applied in other market segments. The case study is represented by 5 single-family houses located in a town in the Province of Bari, all subject to enforcement procedure at the Court of Bari, of which both the value estimated by the expert (Vs) and the selling value of the executed assets (Vv). The reference data of the five comparables are shown in Tab. 1, where the corresponding estimated values (Vs) are arranged in a column for each asset.

The variable DATA is computed in months retrospectively with respect to the moment of the estimate (DAT), the main surface is computed in square meters as a continuous cardinal variable (SUI), as the surface of balcony (SUB) and the surface of the external area (SUE), both computed in square meters as continuous cardinal variables. The last row in which there is a dichotomous variable relating to the private plant (IMP) concludes the table. Consistent with the above (Equation 7), for each of the assets considered it was possible to acquire additional elements of significant interest for the purposes of the proposed application (Table 2).

Table 1. Data collection of the 5 comparables subject to executive procedure in the Court of Bari.

	A	B	C	D	E
Vs	*€ 142,000.00*	*€ 130,000.00*	*€ 128,000.00*	*€ 142,000.00*	*€ 138,000.00*
DAT	15	12	13	14	18
SUI	98	102	85	78	82
SUB	5	3	8	8	7
SUE	12	15	20	12	15
IMP	1	1	0	1	1

Table 2. Further information on the assets subject to real estate execution.

	A	B	C	D	E
MAN	1	2	3	3	1
Tcoll	20	32	21	33	25
On	0.03	0.03	0.03	0.03	0.03
LOC	-	-	-	-	-

Table 3. Market information.

s riv	0.01
p balcony	0.3
p SUE	30
IMP	€ 20,000.00
t^a	12
t^u	35
On	0.03

In particular, for each of the real estate considered, the assessment of the maintenance status organized on three levels is reported as variable MAN, the survey of the sales times calculated in months is indicated with a discrete cardinal variable Tcoll, the costs for the sale approximated with a percentage of 0.03 and, finally, we have the localization variable LOC whose quantification is unknown. The market surveys carried out with reference to the case study, also made possible to identify the mercantile relationships useful for determining marginal prices (Table 3).

In this regard, it is possible to observe that the annual rate of change in prices is positive and is quantified to an extent equal to 0.01; the mercantile ratio of the surface of the balconies is equal to 0.3; the price of the external surface, in the specific market segment, is equal to 30 €/sqm. As for the determination of the marginal prices of the main and secondary surfaces, despite the presence of some recent authoritative advances (Simonotti et al. 2016; Simonotti, 2018), we proceeded by assuming the position ratio between the marginal price and the average price approximating to the unit and therefore considering similar the marginal price equal to the minimum average price (Simonotti, 2016). In detail:

$$p'_{SUI} = \min(p'_{SUI_A}, p'_{SUI_B}, p'_{SUI_C}, p'_{SUI_D}, p'_{SUI_E}) = (€/\text{sqm } 1{,}423.52, €/\text{sqm } 1{,}258.99, €/\text{sqm } 1{,}457.67, €/\text{sqm } 1{,}761.69, €/\text{sqm } 1{,}635.55) = €/\text{sqm } 1{,}258.99 \quad [8]$$

and then

$$p'_{SUB} = €/\text{sqm } 377.70 \quad [9]$$

Therefore:

$$p'_{SUE} = €/\text{sqm } 30.00 \quad [10]$$

It should be noted that the introduction of the position relationship, in addition to making the determination of the value more precise, allows the processing of the MCA even with a very small number of comparables up to one unit. Appearance worthy of attention especially by those who see this model as outdated. As for the value of the plants, assuming a cost value of € 20,000 and taking into account a simple linear depreciation, the corresponding value was reached as indicated below:

$$p'_{IMP} = € 20{,}000 \times (1 - 12/35) = € 13{,}142.86 \quad [11]$$

Subsequently, therefore, it was possible to proceed with the determination of the value deriving from the estimate function for the various comparables, as indicated in Table 4.

The difference between the estimate value and the value deriving from the estimate function can be motivated by the differences in the localization variable or by other variables not considered in the evaluation procedure. Moreover, in this regard it should be noted that, in the context of the executive procedure examined,

Table 4. Value from estimation function of comparable A.

	A	
Vs	€ 142,000.00	
DAT	- € 1,775.00	15 *- 0.00083 * € 142,000.00€ = -€ 1,775.00
SUP	€ 123,380.95	98 * 1,258.99 €/sqm = € 123,380.95
SUB	€ 1,888.48	5 * 377.70 €/sqm = € 1,888.48
SUE	€ 360.00	12 * 30 €/sqm = € 360
IMP	€ 13,142.86	1 * € 13,142.86 = € 13,142.86
	€ 136,997.29	

Table 5. Difference between the value and selling price for comparable A and the calculation of the costs for the sale.

Vs	€ 142,000.00
Vv	€ 95,000.00
On	€ 2,850.00
Vs-Vv- On	€ 44,150.00

Table 6. Value from estimation function of comparable B.

B	
€ 130,000.00	
- € 1,300.00	12* – 0.00083 * € 130,000.00 = – € 1,300.00 €
€ 128,416.91	102* 1258.99 €/sqm = € 128,416.91
€ 1,133.09	3* 377.70 €/sqm = € 1,133.09
€ 450.00	15* 30 €/sqm = € 450.00
13,142.86 €	1* € 13,142.86 = € 13,142.86
€ 128,700.00	

Table 7. Difference between the value and selling price for comparable B and calculation of the costs for the sale.

Vs	€ 130,000.00
Vv	€ 120,000.00
On	€ 3,600.00
Vs-Vv- On	€ 6,400.00

none of the five evaluators involved made any reference to international standards of any kind, referring mainly to the indications of the databases of the Observatory of the Real Estate Market (OMI) or to their expertise in the elaboration of the valuation. Their valuations are based on single-parameter method, which, obviously, still represents a "valid" reference in the professional activity of many technicians and appraisers. In the Table 5 is indicated the difference between the value and the selling price for comparable A:

The difference between the estimated value and the placement value of asset A, equal to € 44,150 (Table 5), represents the value to be implemented in the model proposed and explained previously with formula 7. The final line represents precisely this difference net of the charges that are traditionally connected with the sale of the asset in the judicial procedure. The same application is carried out to the other four comparables. Similarly, the value obtained from the estimate function is followed by the determination of the difference between the valuation and the selling price of execution, net of the related sales charges.

The selling price of comparable B makes it possible to detect the difference between Vs and Vv (Table 7).

The same procedure is then proposed for comparable C, determining first the estimate function and then the differences between the estimated value and the forced sale value in the following two tables (Tables 8 and 9).

Also in this case, the difference between the value and the selling price is determined (Table 9).

As reported for the previous comparables, the value obtained from the estimation function is also reported for comparable D (Table 10).

Therefore, the difference between the value and the selling price is proposed in the table below (Table 11).

Lastly, the value is determined from the estimation function of the last comparable E (Table 12).

And finally, the recognition also for comparable E of the difference between the value and the selling price (Table 13).

After the determination of the value of the various comparables defining the corresponding estimation functions and after the calculation of the relative differences between the values and the selling price in the judicial procedure, the application of the additive model set in equation 7 is proposed to explain the aforementioned differences. In this regard, it should be noted that the differ-

Table 8. Value from estimation function of comparable C.

C	
€ 128,000.00	
- € 1,386.66	13* – 0.00083 * € 130,000.00 = – € 1,386.66
€ 107,014.09	85* 1,258.99 €/sqm = € 107,014.09
€ 3,021.57	8* 377.70 €/sqm = € 3,021.5743
€ 600.00	20* 30 €/sqm = € 600.00
€ 0.00	0* € 13,142.86 = € 0.00
€ 109,249.00	

Table 9. Difference between the estimate and placement value for comparable C and calculation of the costs for the sale.

Vs	€ 128,000.00
Vv	€ 94,000.00
On	€ 2,820.00
Vs – Vv – On	€ 31,180.00

Table 10. Value from estimation function of comparable D.

D	
€ 142,000.00	
- € 1,656.66	14* – 0.00083* 142,000.00 = – € 1,656.66
€ 98,201.17	78* 1,258.99 €/sqm = € 98,201.17
€ 3,021.57	8* 377.70 €/sqm = € 3,021.57
€ 360.00	12* 30 €/sqm = € 360
€ 13,142.86	1* € 13,142.86 = € 13,142.86
€ 113,068.93	

Table 11. Difference between value and selling price for comparable D and calculation of charges.

Vs	€ 142,000.00
Vv	€ 87,000.00
On	€ 2,610.00
Vs-Vv- On	€ 52,390.00

Table 12. Value from estimation function of comparable E.

E	
€ 138,000.00	
- € 2,070.00	18*- 0.00083* € 138,000.00 = -2,070.00€
€ 103,237.12	82* 1,258.99 €/sqm = € 103,237.12
€ 2,643.88	7* 377.70 €/sqm = € 2,643.88
€ 450.00	15* 30 €/sqm = € 450
€ 13,142.86	1* € 13,142.86 = € 13,142.86
€ 117,403.86	

Table 13. Difference between estimate and placement value for comparable E and calculation of charges.

Vs	€ 138,000.00
Vv	€ 102,000.00
On	€ 3,060.00
Vs-Vv- On	€ 32,940.00

ences found also dependent on the different skills of the evaluators involved in the procedure, since in the presence of adequate skills and competences of the appraiser, effectively applied in the assigned judgment, they should lead to a reduction of the consistency of the diversity of these values (Vs and Vv). Under favourable conditions, the differences that can be found could presumably tend to diminish until they are almost completely downsized, in the most virtuous cases, in the two variables maintenance (MAN) and costs (On), reducing the weight of the variable location (LOC) and/or the variable time on market (Tcoll). It is possible to set up the following supplementary estimation system (Sistema Integrativo di Stima) that will explain the variables of the model.

$$\begin{bmatrix} 44{,}150\,€ \\ 6{,}400\,€ \\ 31{,}180\,€ \\ 52{,}390\,€ \\ 32{,}940\,€ \end{bmatrix} = \begin{bmatrix} 20 & 3 & 1 \\ 32 & 2 & 1 \\ 21 & 1 & 1 \\ 33 & 1 & 1 \\ 25 & 3 & 1 \end{bmatrix} \begin{bmatrix} p'_{TColl} \\ p'_{MAN} \\ p'_{LOC} \end{bmatrix} \quad [12]$$

Therefore, an estimate function is obtained that is useful for predicting the forced sale value in the specific market segment, using few comparables (Table 14).

Table 14. Results of the integrative estimation system.

ACRONYM	VARIABLE	IT VARIABLE	AMOUNT	MEASURE
LOC	LOCATION	VARIABILE LOCALIZZATIVA	€ 46,736.70	
MAN	MAINTENANCE	MANUTENZIONE	€ 3,337.54	PER SINGLE CLASS
TCOL	TIME ON MARKET	TEMPO COLLOCAM	-€ 763.35	PER MONTH

The indicated function allows to highlight the role of time on market. It also confirms that the difference between the appraisal value and the selling price of the executed asset can be effectively used through an appropriate model to determine the value of the appraised asset in a more appropriate way to the objectives and context of estimate with respect to what does not happen in conditions of greater uncertainty or even arbitrariness to which the result of the estimate is exposed in the presence of estimates attributable only in part to objective, replicable and transparent criteria.

5. CONCLUSIONS AND FUTURE DIRECTIONS OF RESEARCH

By the formulation of an objective, fair and shareable valuation, it follows the possibility of contributing to the achievement of the objectives of effectiveness and efficiency of the real estate execution procedures, as well as to obtain greater social and economic fairness, in line with what is desired by the evaluation standards and by the stakeholders, including the CSM Guidelines (2017) on good practices in the field of real estate executions. On the other hand, with a view to managing the risk associated with the life of the mortgage loan, a more reliable assessment of the amount that can be recovered following the outcome of the executive procedure contributes for the bank to a better definition of the risk associated with the exposure and sustainability of the loan "in relation to credit-granting processes, and throughout the life-cycle of credit facilities" (EBA, Guidelines on loan origination and monitoring)[7]. In consideration of the specific reference legislation, in particular for the purpose of determining the value of the property pursuant to art. 568 of the Italian legislation (i.e. the Code of Civil Procedure), as well as the need for the expert (appraiser) to take into account the binding technical, economic and legal conditions in determining the value of a real estate, the need arises to express an estimate in which the basis of the value is constituted by a market value, which is anyway obtained also by assumptions special assumptions (IVS, 2022; TEGOVA, 2020)[8]. In the valuation process, therefore, the valuer operates by resorting to assumptions which, if not adequately weighted, in addition to conditioning the judgment of the estimate, could negatively affect the judicial procedure in consideration of the purposes of the estimate in the context of the performance of the procedural process.

The appraisal report, in fact, constitutes a procedural document of absolute relevance in cases of forced sale and also, in this context, must in any case meet the requirements of transparency, reliability and verifiability, recognized by the best valuation practices at national and international level.

The assumptions made by the expert (appraiser) must therefore be adequately illustrated and justified also in order to contain the risk of determining the value of the property being valued through an approximate (and therefore potentially arbitrary) reduction of the corresponding market value of the asset. In this sense, the possibility of having an appraisal model available that allows to operate objectively, as well as to verify the work of the valuer, represents an extremely useful opportunity to safeguard the transparency of the processes and to guarantee the effectiveness of the valuation judgment. The model proposed and illustrated appears to be consistent with these needs; in addition, it is believed that the results of the application described could in turn be consistent with the data limitations that affect the estimation activities in the case of forced sale. The functional model for estimating the forced sale value with the market comparison method (stMCA) through a limited number of comparables (so-called "short table") allows, in

[7] EBA/GL/2020/06, Par. 2 (Subject matter, scope and definitions), Point 7: "These guidelines apply to institutions' internal governance arrangement and procedures in relation to credit-granting processes, and throughout the life cycle of credit facilities. Furthermore, these guidelines apply to the risk management practices, policies, processes and procedures for loan origination and monitoring of performing exposures, and their integration into the overall management and risk management frameworks".

[8] In the event of a forced sale, the valuer must not carry out the valuation on the basis of the forced sale, but rather on the basis of the market value with the special assumptions that apply to the specific case ABI, 2022 and EVS 2020, EVS 1, Note 4.10. 7.5.

fact, to determine an additive function, which allows the formulation judgments of the value of the asset as certain "external" circumstances vary, which could affect the value of the asset itself, which should be taken into account in the estimation conditions that characterize the sale of an executed real estate. In the context of the executive procedures, the conditions that can determine the change in circumstances capable of influencing the value of the asset, can manifest themselves to a significant extent with significant effects also on the final liquidation value of the property.

The determination of a function capable of incorporating the variability associated with placement times, together with other variables capable of affecting the value of the asset during the process such as, for example, any changes in its maintenance status (even if purely theoretical as it is inhibited from the procedure), therefore appears useful, as it is capable of evaluating the variation between Vs and Vv. Furthermore, the application of the proposed model shows that it is possible to determine an estimation function capable of predicting the forced sale value in the specific market segment, highlighting, albeit in a predictive manner, the placement times necessary to proceed with the liquidation.

In particular, it allows to arrive at the determination of the value of the asset that constitutes the collateral of the loan in a way that is more objective, appropriate and suited to the objectives and the context of estimation than can happen through synthetic (and sometimes abstract) reductions in value made in a more or less arbitrary way on the value of asset market.

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ORCID:
FBU: 0000-0002-9949-640X
LK: 0000-0002-7265-245X
MY: 0000-0002-2664-6251

GeoValueIndex map of public property assets generating via Analytic Hierarchy Process and Geographic Information System for Mass Appraisal

Fatma Bunyan Unel*, Lutfiye Kusak, Murat Yakar

Department of Geomatics Engineering, Mersin University, Turkiye
E-mail: fatmabunel@mersin.edu.tr, lutfiyekusak@mersin.edu.tr, myakar@mersin.edu.tr
*Corresponding author

Abstract. The aim of this study is to develop a value-based GeoValueIndex with AHP weights and GIS for the criteria of the Mersin University (MEU) Çiftlikköy Campus real properties, and it is referred to as the "GeoValueIndex" in this study. GeoValueIndex is a symbolic value that combines geographic and non-geographic features of real properties. The data of the real properties on the campus were collected and arranged for mass appraisal. One of the Multi Criteria Decision Analysis (MCDA) methodologies, Analytic Hierarchy Process (AHP), was used to weight the criteria. GeoValueIndex was calculated by multiplying each parcel's geographic and non-geographic data by their weights and adding them. GeoValueIndex Map is obtained by associating GeoValueIndex and parcel in GIS software. GeoValueIndex of real properties save time, effort, and cost in mass appraisal processes. There are many techniques for doing GeoValueIndex operations, and the ones presented in this study are only proposals.

Keywords: Public Property Assets, Mass Appraisal, Analytic Hierarchy Process, GeoValueIndex.
JEL codes: C02, D79, K25, R39.

1. INTRODUCTION

1.1 The state and public property assets

The state properties that include national real estate, Treasury goods, or simply "Treasury", are real properties saved and managed by the State. Private properties are real properties that are under the purview of both real and private legal entities and are governed by private law. Additionally, there are real properties that the State also owns in private property. The state and private properties are different from each other. When the state properties are exerted by appropriating for public institutions, the private properties can be used with the public interest through expropriation. The private

properties cannot be used if there is no public interest. The revenues from state property vary according to time, countries and applied economic and financial policies. These indicate the State's fixed capital[1]. In addition to providing revenues from public properties, the state also receives revenues from privately owned properties. Transactions involving state-owned assets, such as sales, leasing, bartering, adequate pay, and easements, as well as payments for private properties, including property taxes, income taxes, insurance premiums, and value-added taxes, are seen as a regular source of income for the state. Therefore, the most important income sources of countries are real properties.

The state properties are handled according to the budget type of public institutions and organizations[2]. The state properties can be classified as four headings:

- Privately owned by the Treasury;
- Places under the sovereignty and disposal of the State (rocks, hills, mountains, sea, lake, river, etc.);
- Places reserved for public service (police station, school buildings, hospital, library, prayer place, etc.);
- Places in the common use of the public (pasture, highland, winter quarters, threshing and fairgrounds, etc.).

All of these real properties are managed by the State. The real properties that are privately owned by the Treasury and the places under the sovereignty and disposal of the State, which are not subject to registration and restriction, are also referred to as National Real Estate[3]. Public properties are those assets that are registered in the name of a public legal entity and reserved their usages for public interest[4]. These consist of treasury lands, land and buildings belonging to universities, public institutions and organizations, etc. Some of the treasury properties have been allocated to the universities and other institutions. The treasury properties consist of registered private owned properties, the places under the sovereignty and disposal of the State, and related properties. According to the report of the General Directorate of National Real Estate (MEGM), these are 4 million 662 thousand 231 units. The total surface area of these corresponds to approximately 44.4% of Turkiye's surface area. According to the report prepared two years ago, it was seen that the number of real estates increased by 10.9% [5].

State and public properties are very productive resources for countries. However, it is not fully utilized. Realistic policies should be adjusted to life by determining targets for solving land-related problems in order for them to be used efficiently and effectively. Policies can be listed as economic growth, justice and social development, transparent financial situation and environmental sustainability (Zimmermann, 2007). For the innovative management techniques, conformity of new public management examined the examples of Canada (Glor, 2001) and the USA (Lynn, 2005). The new public land management is proposed by including accrual accounting in the public sector. It is remarked that accrual accounting is a system used by the private sector and the management tends adopt to the system (Grover, 2008).

While some of university properties are registered to the public legal entity, some of them are able to be allocated from treasury/forest properties. Considering universities' historical development, campus places were generally established outside the cities (Aydın, 2019). There is a need to put forward strategic campus management within the geographic information system in managing universities properties in a sustainable way (Heijer, 2011). In order to leave a liveable, healthy, and peaceful environment on university campuses to future generations, it is necessary to make correct and appropriate decisions about the use of properties.

Capital power should be revealed by presenting unit square meter values or value indexes in a way that the values of the properties are transparent and be calculated the fair current market value. The current market value is used in several countries such as Finland, Germany, Lithuania, and Sweden (Barańska, 2013; Finnish, 2019; Skatteverket, 2015; Stenkula, 2014). In addition, by including the value in the management of public properties, expensive properties were sold, cheap ones were purchased and service buildings were privatized in Sweden (Lundström and Lind, 1996). It is stated that because the financial systems in the economies of Europe and North America are more transparent, consistent models have been formed in both the public and private property markets. It has been determined that there is economic instability as Asia's public property market is unstable and real estate developers and construction activities dominate the property market (Liow and Yeo, 2018). The Polish public land management system is examined and proposed some changes in the system. The land management of some countries is analyzed and compared with questionnaire data. The importance of the decision-making process is revealed by clearly defining the management's goal and scope (Gross and Zróbek, 2015). The market's current property prices should be assessed for public investments. Property value is used for many transactions such as

[1] See also the study of Söyler (2005) on the state properties.
[2] See also the book of Kardeş (2019).
[3] See also the study of Bozpınar, (2021) on the History of The Ottoman National Real Estate Organization.
[4] See also Kadastro Kanunu (Cadastre Law) (1987).
[5] See also the report MEGM (2022).

expropriation, insurance, nationalization, privatization, and credit facilities as well as balance sheet accounts in public administrations and transfer transactions (Invest, 2021; Karagöz, 2010; Soto, 2017; Yalpır, 2007; Yıllık Program, 2018).

1.2 Mass Appraisal of the Public Property Assets

In land management, the real property value has an important role in making the final decisions and ensuring the balance of tax and income. Because of specifically immigration, the rapid concentration of the population in cities directs the development of cities. Accordingly, the land is constantly evolving and changing. At every stage of cadastral operations, zoning applications (Yılmaz and Demir, 2017), housing, industrial, and agricultural land projects (Sagaydak and Sagaydak, 2022), the value of the property rises. In contrast to this, the construction of places such as waste disposal area, garbage collection centers, natural gas and cylinder filling facilities also has a decreasing effect on the value of the property. The value is a crucial piece of property information in calculating the project fees, finding the purchase and selling fees, calculating the income and tax values, and estimating the expropriation price. These provide a serious source of income for the countries.

The value in the management of public property assets is utilized for the Court of Accounts' follow-up to ensure the effective use of treasury assets via accounting for the property. The public institutions and organizations within the scope of Law No. 5018 the Public Financial Management and Control[6], including universities, present Activity Report. Their reports are published every year. It announces to the public that their responsibilities and duties to the public and the State are fully fulfilled and that the resources in their properties are used economically and correctly. In addition, whether the public properties have decreased or not and whether they are used correctly and appropriately is shown by their value.

The properties listed in the land registry on behalf of the legal entity of the Universities are service assets that fall under the category of public properties[7]. The Council of Higher Education, universities and high technology institutes are classified as special budget administrations (Kamu Mali, 2003). It is important to know the value of university properties so that they may be managed better. Therefore, while university properties are specifically appraised, some transactions are similar in considering public properties (Arslan, 2017). In addition, there is a variety of property the form of Treasury, forests, and others that are allocated on behalf of the legal entity of the Universities. Depending on the growth of the universities, construction areas and land uses are changing in line with the needs. In this case, value change also takes place. According to property criteria, environment and economic conditions value maps need to be renewed periodically. However, as long as the criteria remain constant, the system that will allow only the change in value is considered especially suitable for public properties.

There is legislation specifying the procedures and principles regarding the management of the properties owned and used by universities. In Turkiye, the universities which have the legislation (Dicle, 2010; Hacettepe, 2015; İKÇ, 2015; OMÜ, 2011) manage transactions of their properties better. These transactions are sale, exchange, prior authorization, real estate or construction in return for the flat, establishment of the easement, leasing, adequate pay, evacuation, real estate development and valuation. These are carried out either directly or indirectly with the value. The relevant university presents these in the Activity Report. The university prepares the Activity Report following the principles of accuracy, transparency, consistency, impartiality and openness. The report is announced to the public by the Rector and a copy is sent to the Court of Accounts, the Ministry of Treasury and Finance. The Court of Accounts reviews university report and publishes the audit findings[8].

The value of university property should be found by taking into account all the properties as mass appraisal. Mass appraisal of university property is conducted using both geographic and non-geographic data, which constitute property criteria. This approach enables simpler and faster conduct of mass appraisal studies, where criteria affecting the property value are identified, the weight of each criterion is determined, and the GeoValueIndex generation processes are established.

The GeoValueIndex is similar to the nominal value. The nominal method is one of the real estate valuation methods and based on scoring. A nominal asset value-based land readjustment model was developed. In the

[6] See also Kamu Malî Yönetimi ve Kontrol Kanunu (Public Financial Management and Control Law), (Kamu Mali, 2003).

[7] See also Kamu İdarelerine Ait Taşınmazların Kaydına İlişkin Yönetmelik (Regulation on the Registration of Real Properties Owned by Public Administrations) (Kamu Kayıt, 2006) and Kamu İdarelerine Ait Taşınmazların Tahsis ve Devri Hakkında Yönetmelik (Regulation on Allocation and Transfer of Real Properties Owned by Public Administrations) (Kamu Tahsis, 2006).

[8] See also Kamu İdarelerince Hazırlanacak Faaliyet Raporları Hakkında Yönetmelik (Regulation on Activity Reports to be Prepared by Public Administrations) (Faaliyet Raporu, 2006).

land readjustment, a nominal value was used to represent a land value (Yomralioglu, 1993). A GIS-based application was built for the study in Kaşüstü Town, Trabzon Province, to analyze the value difference in the transformation of agricultural land into a zoning parcel. A nominal unit value map was generated by scoring the landscape criterion on a parcel-by-parcel basis between 0-100 (Başer and Dizdar, 2009). The coefficients for the locational, physical and legal conditions of the plots were calculated on a block basis using the AHP method. The physical and legal situation's coefficients were presented as numbers while mapping the AHP weights of locational features (Unel and Yalpir, 2014). The Cobb-Douglas functional, which is the most popular non-linear function, were used as hybrid with multiple regression and AHP weights for estimating the market value with housing criteria in the sales comparison approach (Lisi and Iacobini, 2018). In İzmir, nominal value maps were produced with AHP weights by taking into account 11 locational and slope criteria, and nominal values of pixels were converted into market values (Kayalık and Polat, 2023a). In Berlin, both land and building-based nominal value maps, which were generated using the AHP weights of 11 various locational and slope criteria, were presented in 3 dimensions by classifying very valuable, valuable, less valuable and least valuable (Kayalık and Polat, 2023b).

In a different study, to estimate values, nominal asset values were created with the help of GIS. The questionnaire application in Yomralioglu (1993)'s study, in which the criteria were scored over 100, was used to determine the criteria weights. Each pixel value of the land was multiplied by the weight of the relevant criterion. The process was repeated for the other criteria and results were added up. Their nominal values which are the weighted total were then found (Nişancı, 2005; Nişancı and Yomralıoğlu, 2002). The data of the criteria affecting the value in the city of Oradea were examined for the nominal valuation. These data were generated as a foundation for nominal value by being organized in GIS software (Droj et al., 2010). The study in the Beyoğlu district of Istanbul was implemented with the nominal valuation method. Geographic criteria were weighted with the Best Worst Method. On the other side, raster maps of geographic data were produced with the Euclidean Distance in GIS software. The nominal land valuation model was created by multiplying the weights by the pixel values (Mete and Yomralioglu, 2019). In Afyonkarahisar, value estimation was made using the nominal valuation method in 120 neighborhoods. Social (6), Environmental (5), Personal (3), and other (5) criteria were used. The weights of the criteria were found though a questionnaire. The weights and the properties scores were multiplied and their totals were calculated. With the help of the k coefficient, the value estimations of the properties of unknown value were made. The value map was produced by interpolating with Inverse Distance Weighting (IDW) of the Geostatistical Analysis module in GIS software (Tiryakioğlu and Erdoğan, 2006).

The innovative land valuation model (iLVM) was developed in order to product land value. Geospatial criteria were regraded with a (0-5) score according to distance by using Euclidean distance in GIS software. The criteria were weighted by experts opinion in the analytical hierarchy process (AHP) method. The value obtained from the weighted total result was substituted in the mathematical model and the land value was estimated. As a result, the value map as well as categorized low-density rural, high-density rural and urban maps were prepared (Bencure et al., 2019).

The aim of this study is to determine the GeoValueIndex, which will create the basis for the valuation of public properties belonging to Mersin University, using the AHP method. Register, parcel, land, location, and usage features were taken as the main heading, and the corresponding data with a total of 31 sub-criteria were obtained for each parcel separately. The data were normalized to a range of [1,2]. The criteria weights found by the AHP method and related data were multiplied. The sum of these multiplies forms the GeoValueIndex of each parcel. The GeoValueIndex map was produced with the help of GIS software. this map which forms the foundation for the valuation processes, represents parcel value.

2. MATERIAL AND METHOD

GeoValueIndex is a result of geographics and non-geographics data processes such as standardization, normalization, and weighting. It has been assessed for mass appraisal scope for the university property assets which is one from the Public Property Assets. The criteria affecting the value of the cadastral parcels in the study area were determined, and the data corresponding to each parcel were obtained by arranging criteria to the data. The weights of the criteria were calculated with the AHP method. GeoValueIndex was calculated for each cadastral parcel (Figure 1).

2.1 The study area: Mersin University, Çiftlikköy Campus

Mersin University (MEU) has three campuses, named Çiftlikköy, Yenişehir and Tece, located in different places in the city center. In order to establish the

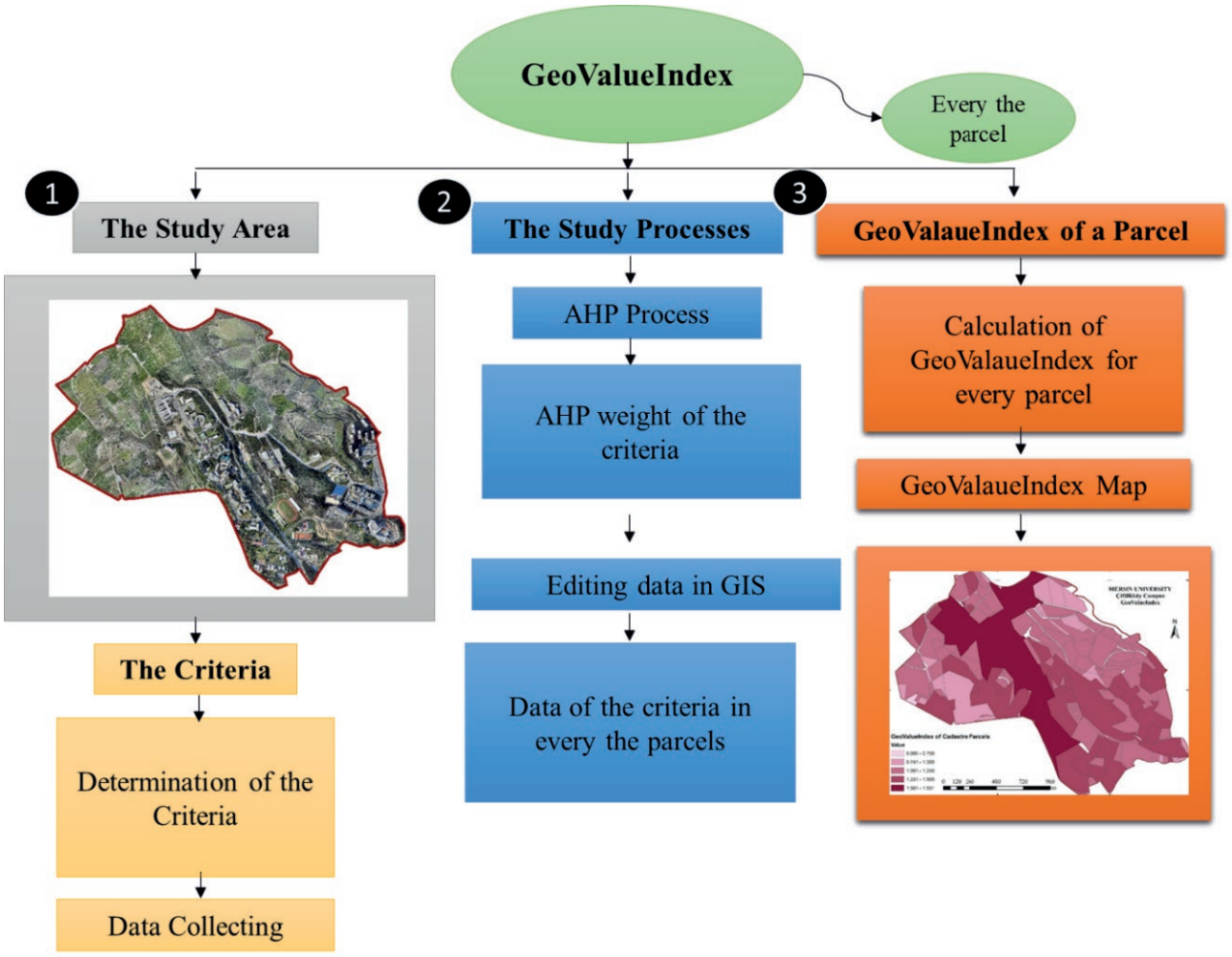

Figure 1. The study diagram.

Land Management and Mass Appraisal Infrastructure, Çiftlikköy Campus, which is the main campus, was taken as a sample. It has an area of 4,181,097 m^2. It is 14 km to the city center, 6 km to the town of Mezitli and 3 km to the Mediterranean. The total closed area on the campus land is 354,346 m^2. 1,820 academics and 1,456 administrative staffs work at Mersin University, where 38,902 students were registered in 2021 (MEU, 2022). There are also social areas in the campus such as medical school, student dormitory, guesthouse, cafeteria, stationery, and sports facilities in here (Figure 2).

The ownership status of the properties located in the Çiftlikköy Campus is varied and there are areas allocated to the Treasury and forest. It has been determined that privately owned properties on the Campus should be expropriated (MEU, 2007; 2019; 2020; 2022). The uses of the properties of the immovable and changes in the academic, administrative, and student numbers should be analysed, from the past to the present. This information will be effective in the selection of criteria by giving an idea in terms of value. Positive value changes can also be observed in the properties around the campus.

2.2 The criteria for mass appraisal

The criteria used in mass appraisal (mass real estate valuation) processes imply the study of characteristics that affect the property value. Although the criteria vary according to the property type and the characteristics, the purpose of the land is also important. For example, there is a planted land in the campus, but its separation as a campus area in the zoning plan means that it will develop in the future and a building will be built on it. In this situation land use and its value are going to vary in accordance with the zoning plan in the future. For

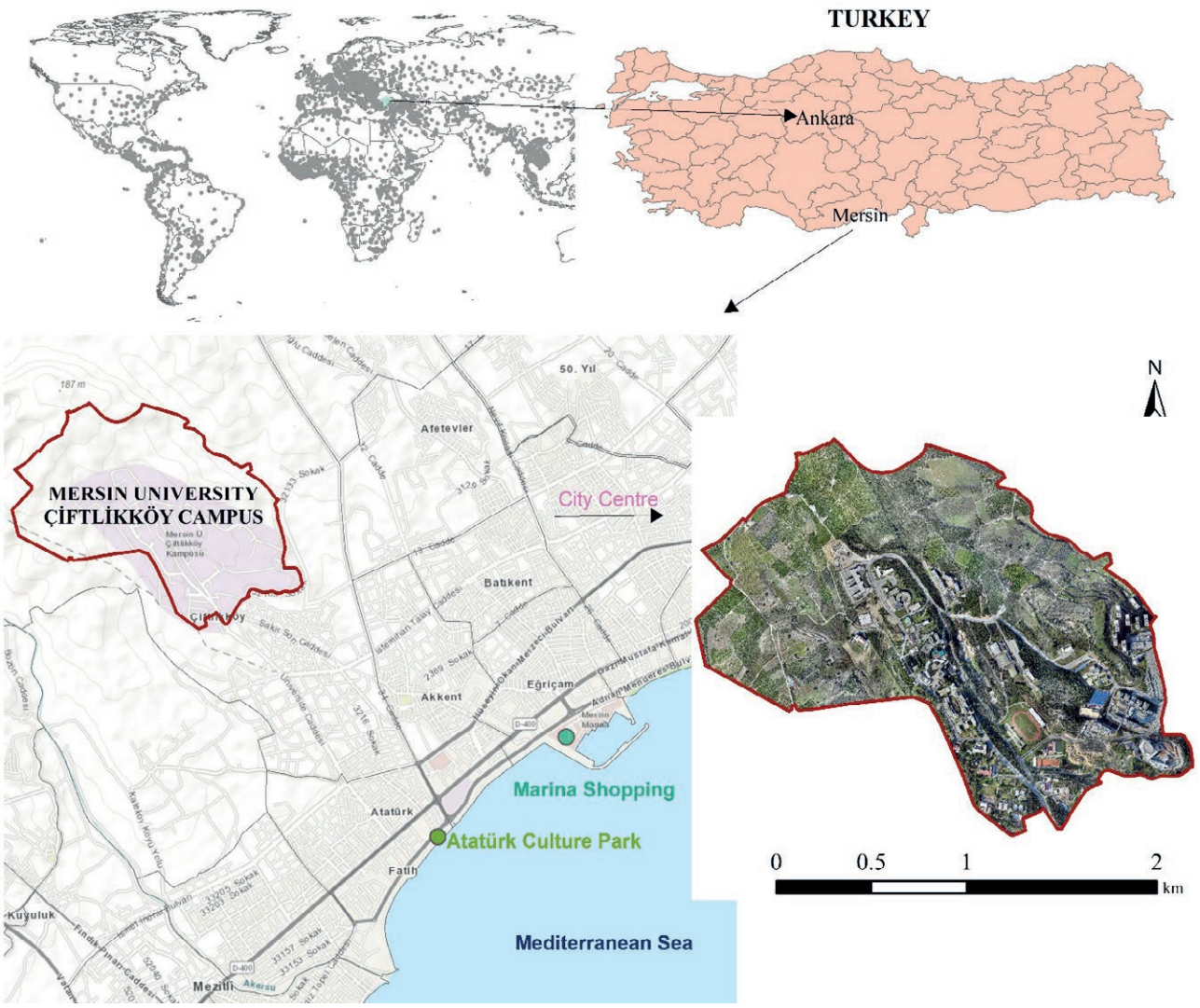

Figure 2. The study area: Mersin University, Çiftlikköy Campus.

this reason, it cannot be regarded as absolute agricultural land. Unfortunately, this also is valid for agricultural lands planned in the zoning and located outside of the residential areas of the city. It is clearly stated that absolute agricultural lands should be protected according to the Soil Conservation and Land Use Law (2005)[9]. However, in such areas, in parallel with the increase in population, the city's drive for growth could be more obvious. It can be classified as the land for which the zoning plan has been applied (plot), the land that has a zoning plan and has not been applied to the land (generally outside of the residential area of the city), land with a master plan, and land without a plan. The zoning (development) plan has detailed information showing the construction conditions and generally scaled at 1/1,000. In addition, it is applied to land. The master plan shows the overall development of the area and is generally scaled at 1/2,000, 1/5,000 or 1/25,000. These regions can be visualised on a map. Therefore, it will be easier to choose the type of real property and to determine criteria based on it.

Many criteria affect real property values (Unel et al., 2017; Ünel and Yalpır, 2019; Yalpır and Ünel, 2019). These criteria' economic worth or weights corresponding to real property value have not yet been properly determined because of supply, demand, choice, culture, regional, etc. The fact that the criteria differ from nation to nation, region to region, and person to per-

[9] See also Toprak Koruma ve Arazi Kullanımı Kanunu (Soil Conservation and Land Use Law) (2005).

son, is extremely effective. In addition, it increases this variability in extraordinary situations such as pandemics, wars, and economic crises. It is required to identify the criteria and the weights that correspond to their economic equivalents by being determined the general social behaviors and habits of each country. In this study, the criteria were listed as a result of the literature review (Açlar and Çağdaş, 2008; d'Amato and Cucuzza, 2022; Kauko and d'Amato, 2008; Mülâyim, 2008; Ünel, 2017; Ünel et al., 2021; 2022). The criteria available in the study area, were used in the mass appraisal processes.

The south of Çiftlikköy Campus is encompassed by residential areas and is within the urban area. The north is covered with agricultural lands and is within a rural area. The campus is located between these two areas and remained on the development border of the city. The campus has a zoning plan and the feature of plot qualified land.

In the literature, the studies also contain that the number of criteria and the criteria used in mass appraisal vary in different regions. In mass appraisal, taking into account all criteria and collecting data is not effective, and it is not possible in terms of time, cost, and effort. General criteria for the country should be determined and the other criteria should be added/removed according to regions. For this, the studies should be carried out to determine the optimum criteria in regions with different characteristics. In other words, the criteria should reflect the socio-cultural structure, preferences and habits of the region. The criteria that will give the highest performance should be used in the analysis (Yalpır and Ünel, 2016).

In the Real Estate Tax Law, the properties are handled in three types as land, plot and building[10]. In Regulation on the Registration of Real Properties Owned by Public Administrations (2006), a "Registration Plan" is created in the form of "Educational and Teaching Buildings and Facilities", "Plot", "Land", "Common Assets" and "General Service Areas" for the registration of properties and the arrangement of summary statements within the scope of general management[11]. In the literature (Emlak Vergisi Kanunu, 1970; Kadastro Kanunu, 1987; Kamu Mali, 2003), there are different groupings and classifications of the criteria that alter according to the type of property. As a consequence, the criteria may be categorized under the following major headings: legal, physical, geographic, and local features (Ünel, 2017). In general terms, the criteria affecting the value of the property can be listed as the type of real property, surface area, corner/intermediate parcel, number of frontages to the road, geometric shape and spatial characteristics. Criteria affecting the value of agricultural land are soil structure, irrigation status, slope, etc. Criteria affecting the plot value are Basement Area Coefficient (BAC), Floor Area Coefficient (FAC), number of floors, building layout, infrastructure status, etc. Criteria affecting the value of building are total construction area, wet floor, number of balconies, elevator, heating/cooling type, etc. For the building; it can be presented as total construction area, wet floor, number of balconies, elevator, heating/cooling type, etc.

It is possible to talk about similar criteria for the mass valuation of university properties. However, the criteria to be processed for Mersin University, Çiftlikköy Campus were evaluated considering the literature and the availability of data. Mersin University was researched within the scope of the project to establish the valuation infrastructure of the Çiftlikköy Campus, and the criteria were listed under six main headings (Table 1). The address information of the cadastral parcels was not used in value indexing processes and was taken into account for correlating with the location. The weights of the main criteria which consist of register, parcel, land, location, and usage features and their subcriteria and were calculated.

2.3 Analytic Hierarchy Process in Multi Criteria Decision Analysis

*"Decision analysis is a set of systematic procedures for analyzing complex decision problems. The basic strategy is to divide the decision problem into small, understandable parts; analyze each part; and integrate the parts in a logical manner to produce a meaningful solution". (*Malczewski, 1999). Spatial decision problems are also more complex and consist of criteria of multiple, conflicting, and incommensurate. Spatial complexity can be dealt with individually with the help of MCDA and GIS. Decision-makers, managers, stakeholders, and interest groups can easily evaluate all criteria via MCDA. Studies between 1990 and 2004 show that MCDA and GIS usage has grown (Malczewski, 2006). When this situation comes to 2022, a perfect match is seen by adding the fuzzy feature which is frequently encountered in conformity analysis (Beshr et al., 2022; Hagos et al., 2022; Raad et al., 2022; Roy et al., 2022).

MCDA is used to solve a variety of decision-making issues, including criterion selection, determination of important criteria, site selection, and evaluation of alternative sites. There are many different methods to use

[10] See also Emlak Vergisi Kanunu (Real Estate Tax Law) (1970).

[11] See also Kamu İdarelerine Ait Taşınmazların Kaydına İlişkin Yönetmelik (Regulation on the Registration of Real Properties Owned by Public Administrations) (Kamu Kayıt, 2006).

Table 1. The criteria affecting the value of MEU property (Ünel et al., 2020; 2021).

A. ADDRESS FEATURES	B. REGISTER FEATURES	C. PARCEL FEATURES	D. LAND FEATURES		
1. Property No 2. Province 3. District 4. Neighborhood 5. Block 6. Parcel	1. Type 2. Area 3. Owner 4. Ownership (Full-Shared)	1. Location on the Block (Corner-Inter.) 2. Geometric shape 3. Access to Road 4. The number of frontage 5. Length of the frontage 6. Technical Infrastructure	*Topography* 1. Elevation 2. Slope 3. Aspect *Geology* 4. Geology	*Hydrography* 5. Frontage Length of Water Line 6. Distance of Water Line 7. Length of Water Road	
	E. LOCATION FEATURES		F. USAGE FEATURES		
	1. Distance to Main Road 2. Distance to City Centre 3. Distance to Mediterranean Sea 4. Distance to Shopping Centre 5. Distance to Green Area 6. Distance to Energy Transmission Line		*Building* 1. Total Building Area 2. Number of Floors 3. Building Age 4. Usage Type	*Water* 5. Pool Area 6. Pool Type	*Vegetation* 7. Tree Type 8. Number of Tree

MCDA independently or in combination with fuzzy forms. AHP, TODIM, TOPSIS, COPRAS, and DEMATEL methods are encountered in mass appraisal (Ball and Srinivasan 1994; Bellver and Mellado, 2005; Bender et al., 2000; Bozdağ and Ertunç, 2020; Çinar and Ünel, 2022; Ferreira et al., 2016; García-Melón et al., 2008; Gomes and Rangel, 2009; Kauko, 2007; Maliene, 2011; Mulliner et al., 2013; Schniederjans et al., 1995; Urbanaviciene et al., 2009; Wong and Wu, 2002; Yılmaz, 2010).

The Analytic Hierarchy Process (AHP) is the most commonly used method of Multi-Criteria Decision Analysis (MCDA). In line with the study aim, a hierarchical structure is built by determining the criteria affecting value, and the problem is simplified. According to how each criterion affects value, pairwise comparison matrices are made, their weights are calculated, and the importance levels of the criteria are determined (Saaty, 1990; 2008). The real estate valuation problems can be listed by determining the importance degrees of criteria, reducing criteria, obtaining weight of spatial places, and predicting value. In this context, AHP method is used to reduce (Ünel, 2017), weighting criteria (Bender et al., 2000; Kauko, 2003; 2007; Kryvobokov, 2005), and estimate residential housing values (Ferreira et al., 2016; Lisi and Iacobini, 2018; Yılmaz, 2010).

The following steps (Saaty, 2008) should be applied to give weights to the criteria (Figure 3). The pairwise comparison matrixes are constituted by taking into account Table 2.

1. The goal is to calculate the weights of criteria that affect real estate value.
2. A hierarchic structure of the criteria is created.
3. The pairwise comparison matrices are constructed.
4. Weights of the criteria are calculated.
5. Controls processes are permeated.

Table 2. The fundamental scale of AHP (Saaty, 2008).

Intensity of Importance	Definition	Explanation
1	Equal Importance	Two activities contribute equally to the objective
2	Weak or slight	
3	Moderate importance	Experience and judgement slightly favour one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgement strongly favour one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favoured very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation

According to the Analytic Hierarchy Process (AHP) process steps, mathematical operations start after the pairwise comparison matrix is created by giving between 1-9 scores of the criteria. The weights are cal-

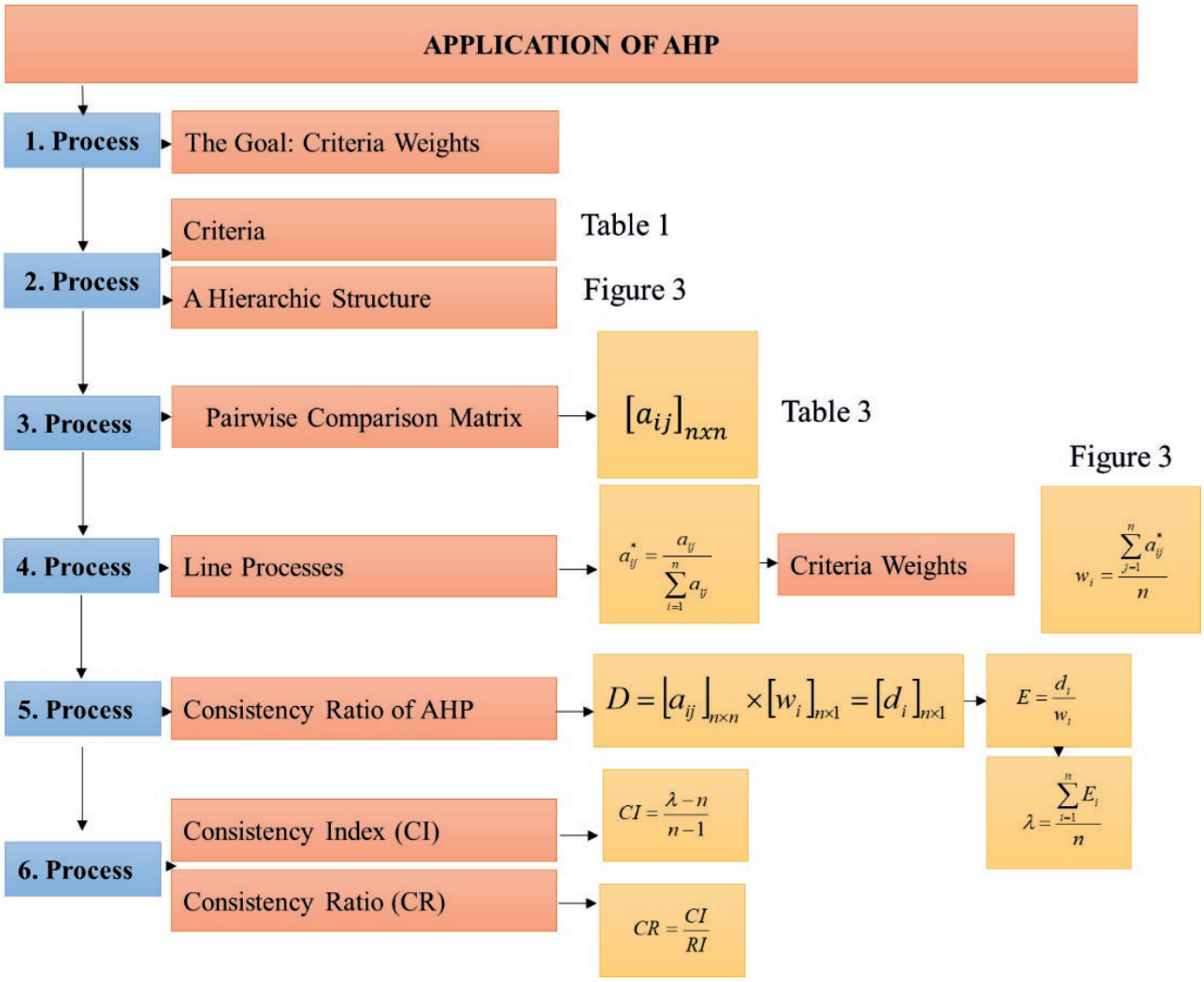

Figure 3. AHP processes and equalities.

Table 3. RI Random Index (Saaty, 1980).

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

culated by dividing each matrix element by the column sum and averaging them.

Consistency Ratio (CR) must be determined in order to check the consistency of the pairwise comparison matrix and AHP weights. For this, nx1 matrices D and E are calculated. The λ value is found with the help of the E matrix and the Consistency Index (CI) is reached using λ. CR is calculated by dividing by the CI Random Index (RI). It is decided whether the AHP processes are consistent or not. RI is taken according to the number of criteria in Table 3 by Saaty (1980). If it is , the criteria comparison is consistent. However, if it is CR>0.10, the result is not consistent, and processes must thus be refreshed.

3. FINDINGS

3.1 AHP weights of criteria

The main criteria affecting the value of the real property on campus consists of register, parcel, land, location and usage information. Each of them also has sub-criteria. The AHP goal is to find the weights of these criteria, which are very important for mass appraisal. The aim of the study is to convert the data which have the real property into the value index of the real prop-

Table 4. Pairwise comparison matrix and line process of the main criteria.

a. Pairwise comparison matrix of the main criteria

#	B. Register	C. Parcel	D. Land	E. Location	F. Usage
B. Register	1	3	4	2	2
C. Parcel	1/3	1	2	1/3	1/3
D. Land	1/4	1/2	1	1/5	1/5
E. Location	1/2	3	5	1	1
F. Usage	1/2	3	5	1	1
Total	2.5833	10.5000	17.0000	4.5333	4.5333

b. Line process in the main criteria

#	B. Register	C. Parcel	D. Land	E. Location	F. Usage	W
A. Register	0.39	0.29	0.24	0.44	0.44	0.3581
B. Parcel	0.13	0.10	0.12	0.07	0.07	0.0978
C. Land	0.10	0.05	0.06	0.04	0.04	0.0583
D. Location	0.19	0.29	0.29	0.22	0.22	0.2429
E. Usage	0.19	0.29	0.29	0.22	0.22	0.2429

erty by using the criterion weights.

In the AHP method, the goal, criteria and hierarchy were determined and the pairwise comparison matrix of the criteria were created by experts. The criteria were compared in pairs according to the hierarchy order and a score between 1 and 9 was given (Table 4a). Line processes were performed by dividing by each cell element by the column total (Table 4b). The weights of each criterion were calculated by taking the average of the rows in the Line processes in Table 4b.

In order to understand whether the pairwise comparison matrix and the AHP weights are consistent, D and E matrix were found. The CI depending on the value was found, and the result (CI) was divided the RI value which is 1.12 corresponding to the 5 criteria number. CR was calculated as 0.0260. Consequently, it was understood that the AHP processes performed with the main criteria were consistent due to (Table 5).

The weights of the main criteria were found. A similar way was applied for the sub-criteria under each of the main criteria. Firstly, a pairwise comparison matrix was created according to the experts' opinion for the sub-criteria. Then, AHP weights were calculated by performing the processes. For example, Register Features (0.3581) and sub-criteria consist of type (0.0883), area (0.1575), owner (0.4824), and ownership (0.2718) (Table 6).

As a result of the multiplication of the main criteria (MC) and the sub-criteria (SC) weights, final weights (FW) were also found 0.0316, 0.0564, 0.1727, and 0.0973, respectively (Figure 4, Table 6). The same procedure was followed for the other main and sub-criteria. The sum of the sub-criteria' final weights is equal to 1. AHP hierarchical structure was presented with final weights (Figure 4).

Table 5. Pairwise comparison matrix of the main criteria.

#	*D*	*E*	*λ*	*RI*	*CI*	*CR*
B. Register	1.86	5.18	5.1167	1.12	0.0292	**0.0260**
C. Parcel	0.50	5.07				
D. Land	0.29	5.04				
E. Location	1.25	5.14				
F. Usage	1.25	5.14				

3.2 Editing geographic and non-geographic data

The criteria affecting the value of public real property in the Mersin University area were determined and their data were collected. The data have different formats such as text, number, and geographic. It has been converted into numbers to correspond to each parcel. Geographic data was imported into GIS software, arranged and reclassified for this use. Geographic data consists of a cadastral map, the zoning plan, an orthophoto map, a digital elevation model, geology, hydrography and building maps. Data such as area, location on the block, geometric shape, number of frontages, and length of frontages were obtained from the cadastral map. The digital

Table 6. AHP weights.

MC	W1	No	SC	W2	W3 (FW)
B.REGISTER	0.3581	B1	Type	0.0883	0.0316
		B2	Area	0.1575	0.0564
		B3	Owner	0.4824	0.1727
		B4	Ownership	0.2718	0.0973
C. PARCEL	0.0978	C1	Location on the Block	0.2052	0.0201
		C2	GeometricShape	0.1144	0.0112
		C3	Access to Road	0.3102	0.0303
		C4	The number of frontage	0.0300	0.0029
		C5	Length of the frontage	0.0300	0.0029
		C6	Technical Inf.	0.3102	0.0303
D. LAND	0.0583	D1	Elevation	0.0395	0.0023
		D2	Slope	0.2315	0.0135
		D3	Aspect	0.1101	0.0064
		D4	Geology	0.0649	0.0247
		D5	Frontage Length of Water Line	0.0649	0.0038
		D6	Distance of Water Line	0.0649	0.0038
		D7	Length of Water Road	0.4241	0.0038
E. LOCATION	0.2429	E1	Distance to Main Road	0.2500	0.0607
		E2	Distance to City Centre	0.2500	0.0607
		E3	Distance to Mediterranean Sea	0.0833	0.0202
		E4	Distance to Shopping Centre	0.0833	0.0202
		E5	Distance to Green Area	0.0833	0.0202
		E6	Distance to Energy Transmission Line	0.2500	0.0607
F. USAGE	0.2429	F1	Total Building Area	0.1159	0.0282
		F2	Number of Floors	0.2636	0.0640
		F3	Building Age	0.1422	0.0345
		F4	Usage Type	0.2636	0.0640
		F5	Pool Area	0.0528	0.0128
		F6	Pool Type	0.0227	0.0055
		F7	Tree Type	0.0696	0.0169
		F8	Number of Tree	0.0696	0.0169
				TOTAL	1.0000

elevation model defines the terrain topography showing the elevation of the campus above sea level. With the help of this model, slope and aspect maps were produced in GIS software (Figure 5).

Within the scope of the study area, non-geographic data were converted into numbers form to enable mathematical procedures. The data are the type of the parcel (land, plot, and buildings), the owner (MEU, treasury, forest, private), ownership status (full/shared), location on the block (corner/intermediate), geometric shape (distorted, medium, smooth), access to the road and technical infrastructure (yes-none). The slope levels that can easily be realized in construction or agricultural activities are taken into account and the scoring was made from high to low according to the increase in slope. The aspect was evaluated by giving a high point to the south frontage and fewer points than the south to the other frontages.

The slope and aspect were produced from a digital elevation model and their situation within each plot is revealed. By using 10 classes of the study of Pennock (2015) on slope map and degree ranges of ArcGIS (2022) software in aspect map, both were also reorganized as 10-classed maps. There are different pixel values in different classes that fall within the boundaries of a parcel. In ArcGIS, the classes within each parcel were found and the numbers of each class were recorded by transferring them to the external environment. The number of classes was divided by the total number of pixels in the parcel. The results were multiplied by the slope class score and the weighted slope value of each plot was obtained. A similar calculation was performed for the aspect.

The building age included in usage features was found by subtracting the year of construction from 2022 and is a criterion that has a negative effect on the value of the real property. While the building age is based on years, the features and units of the other criteria also vary. Therefore, geographic and non-geographic data were normalized between [1,2] with Equation [1] by adding 1 to the min-max normalization progress. The method which is usually called as scaling method, preserves relationships with all data without bias. The data are normalized by performing a linear transformation (Ali and Faraj, 2014; Jain and Bhandare, 2013; Li and Liu, 2011). However, data within a certain range, such as the ownership status and the location of the block, were not subjected to the normalization process because of scored.

$$X' = \frac{x_i - x_{min}}{x_{max} - x_{min}} + 1 \quad [1]$$

X' : Normalized value.
x_i : i. Value in the dataset.
x_{min} : The smallest value in the dataset.
x_{max} : The largest value in the dataset.

3.3 GeoValueIndex Map

The GeoValueIndex was obtained from geographic and non-geographic data for each parcel. Geographical data were organized in GIS software and non-geographical data were standardized by scoring and all data were regulated in matrix format. The criteria were weighted with the AHP method. The normalized data of the par-

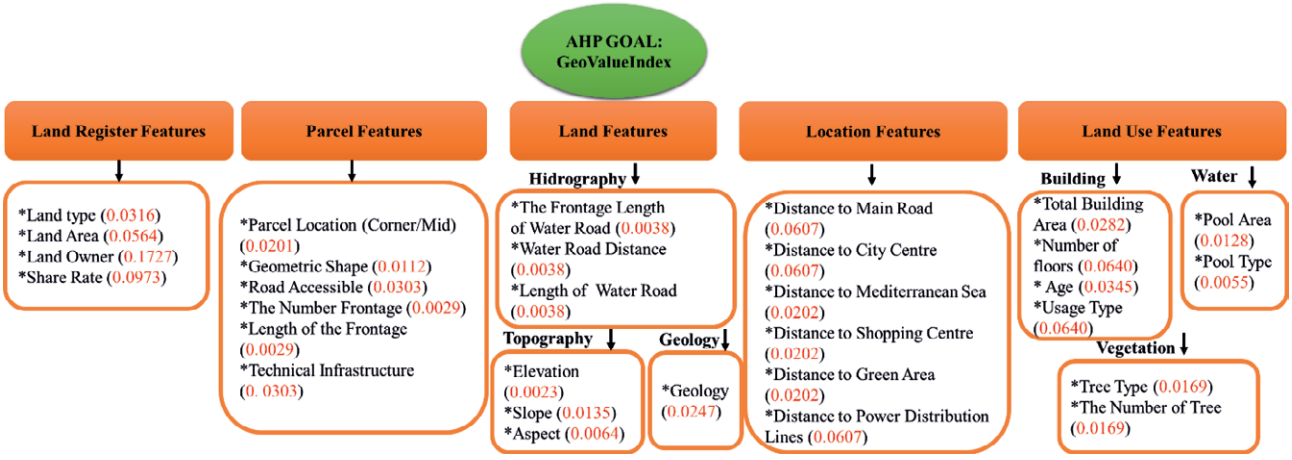

Figure 4. The hierarchy and weights of criteria affecting the value of MEU real property.

cels were collected by multiplying the AHP weights of the criteria (w_i). In this way, the value basis has been made a whole by adding the features of the parcels weighted (Equation 2). GeoValueIndex was found for each parcel to reflect the value on large-scale maps.

$$GeoValueIndex = \sum_{i=1}^{n} (w_i * Normalized\ Data\ of\ Parcel) \quad [2]$$

The cadastral parcels, which are geographical data, and the GeoValueIndex of the parcels were integrated and mapped in the GIS software (Figure 6). The GeoValueIndex belonging to the parcels was obtained by calculating outside of GIS software. For this; All the data belonging to the sub-criteria were prepared in a matrix format for each cadastral parcel. The matrix is arranged in numerical form with parcel numbers in rows and sub-criteria in columns. Since these data were in different units and number ranges, they were all brought to the same range by normalizing. In other words, the parcel and criterion matrix consist of standard data in the range of [1,2]. Since the sum of the sub-criteria' final weights is 1 and building age is the negative effect, GeoValueIndex was obtained in the range of [0.590-1.551] by multiplying the normalized data and the weights.

Standing out in the Çiftlikköy Campus, cadastre parcel number 2166 has the highest GeoValueIndex. The most important reason for this, the parcel is the largest in terms of area. In addition, most of the faculties were built on the parcel. The register features, which is related to use permits and restrictions, is the most important according to other main criteria. Location and usage features have 2nd and 3rd importance according to the weights. Since the sub-criteria weights belonging to them are high, the weight of the owner and full ownership under the register features is also high. The lands registered and allocated in the name of Mersin University are important for the public user, and their score seems to be high as a plus value. As location features, the parcels numbered 2166 and 2168 are close to the main road and the city center. The building usage type and the number of floors are the criteria that have the highest weight in usage features. Many important faculties such as engineering, architecture, science and literature, education, economics and administrative sciences, nursing, conservatory, as well as the rectorate and administrative buildings were built on parcel number 2166. Many advantages of parcel no. 2166, where Çiftlikköy Campus was established, have been identified. The campus has two main entrances, one to the faculties in the south and the second to the southeastern medical faculty.

Since the weights of parcel and land features are lower than the others, elevation, the number of frontages, and the length of the frontage were found to have the lowest weights among the sub-criteria. Therefore, the fact that the parcel is located at a height, the number of frontage is many, and the length of the frontage is long has been determined to add a very low value.

On the other hand, parcels which are with GeoValueIndex less than 1,000 such as 700, 1832, 1926, and 1943 have small areas, no buildings, and are privately owned. It is observed that the GeoValueIndex is lower because the north and northwest of the campus are in rural areas and far from the city center, the sea, the green area, the shopping centre, and road access is low. On the contrary, it is determined that the GeoValueIndex is higher in the south and southeast of the campus due to proximity to urban area and mobility.

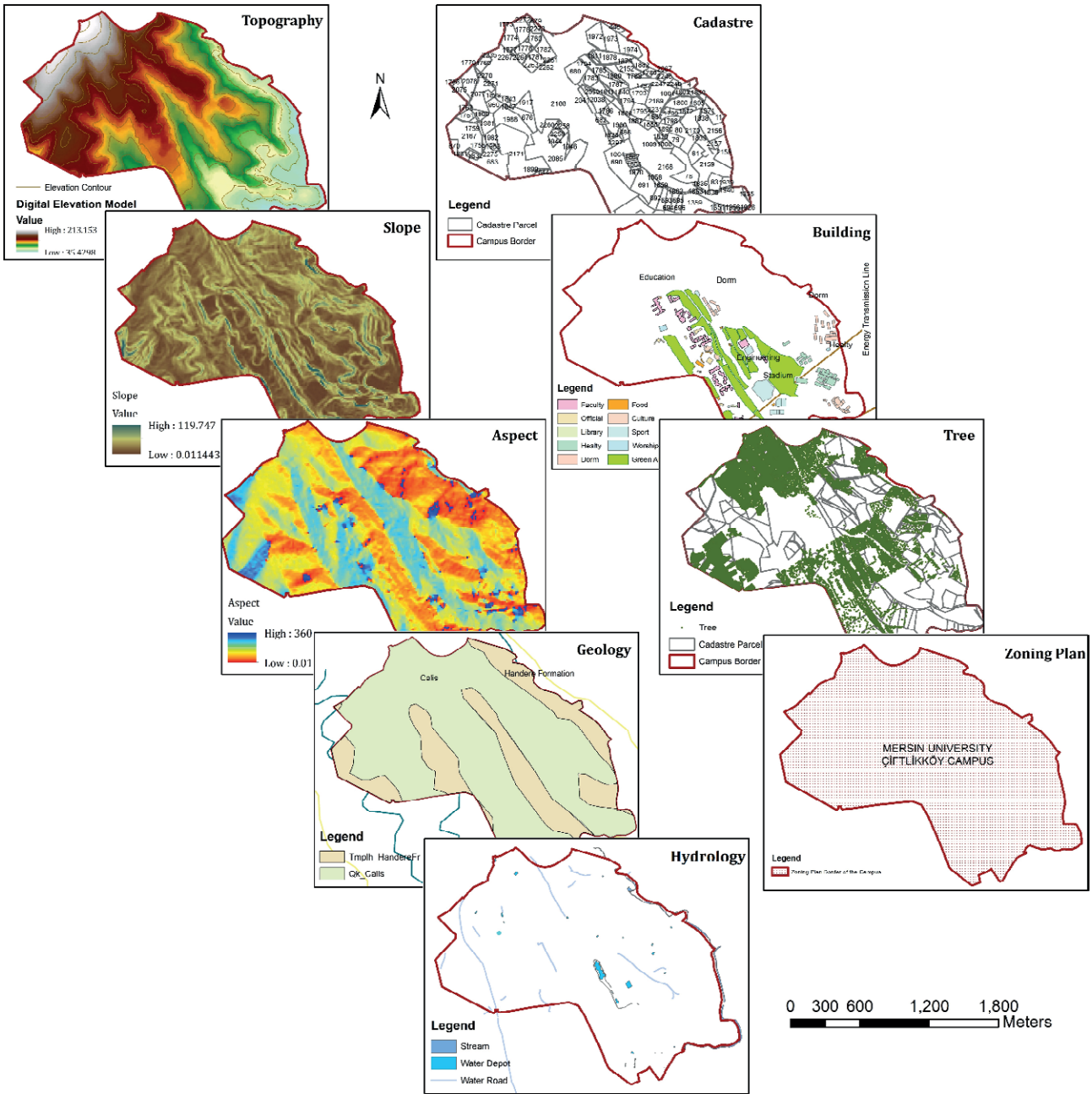

Figure 5. Geographic data.

4. DISCUSSION

The real property value is directly related to its location, features, and users. Constructing a mathematical model to represent this relationship and value is not easy. The variety of the data and the presence of different forms and structures, such as numeric, text, and geographic data, are the reasons for this challenge. The processes in this study were performed by considering real property types such as land plot, residential, commercial, etc., as a whole. In this context, all details of real property are important in terms of determining its value.

The house price index determined by the Turkiye Democracy Center Bank is calculated by using the values estimated in the valuation reports. The Housing Price Index was published on a provincial basis (TCMB,

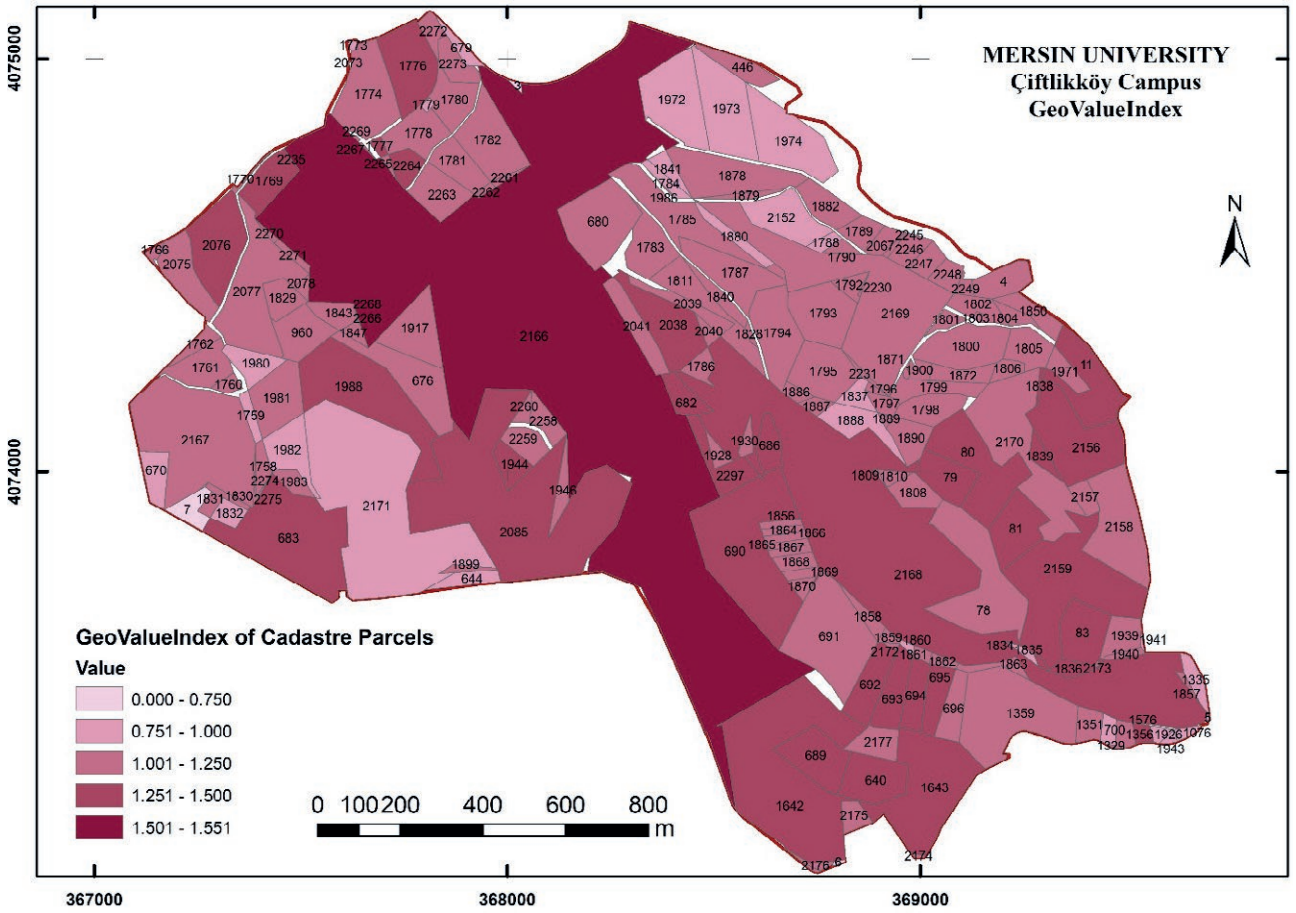

Figure 6. GeoValuIndex Map.

2022). The study, which examined the indices of commercial property, was carried out in the United States. Three types of indexes which are the index that reconstructs market value, the post-processing index and the Index consisting of Real Estate Investment Trusts were examined. These indexes are handled entirely on value (Fisher et al., 1994).

Based on the scoring used in the nominal valuation method, it is similar to the GeoValueIndex. The studies, which are land readjustment (Yomralioglu, 1993), value prediction (Nişancı and Yomralıoğlu, 2002), and the basis for the valuation (Droj et al., 2010; Mete and Yomralioglu, 2019; Unel and Yalpır, 2014) were implemented with the nominal valuation method. In the study of Yomralioglu (1993), a nominal asset value-based land readjustment model was developed. Yomralioglu (1993) found a nominal asset value for land readjustment model, and Bencure et al. (2019) built the innovative land valuation model (iLVM). In these studies, it was determined that questionnaire, AHP and Best/Worst methods were used to find the weights of criteria. It is seen that reinforcement distances are generally determined by Euclidean Distance in GIS software. Value maps were prepared with Inverse Distance Weighting (IDW) of the Geostatistical Analysis module.

In this study, the weights of the criteria were calculated by the AHP method by considering the public real properties. All geographic and non-geographic data were obtained for each parcel in matrix format and multiplied by the criteria weights. As a result, GeoValueIndex was found separately for each parcel. While valuing real estate, GeoValueIndex offers several advantages. It serves as the foundation for the prediction model by taking into consideration GeoValueIndex as the independent variable and the market value as the dependent variable. The conversion from GeoValueIndex to value will be faster and easier within the provision of information that has the market value on the valuation date. The GeoValueIndex of the parcels can be compared with each other. There is also the possibility of updating the GeoValueIndex when there is any change in the criteria. When these processes are applied to privately owned

real properties, calculating values such as tax, insurance, and expropriation will be even easier and each parcel will be subjected to a standard application.

5. CONCLUSION

The real property value is an important parameter for land management. However, it is not possible to estimate the number that makes up the value with a single process. Each property has its own characteristics. It can objectively be used to estimate the value according to these characteristics and the other features. In this study, the features that make up the values of real properties are processed one by one and converted into a single index in line with their different weights. With this index, it will be possible to reach the value in the desired time interval. The advantage of the index is that it is suitable for places that have completed their development, or regional that have not changed for many years, or agricultural lands. It will also form the basis for processes such as taxation, expropriation, and insurance.

There are many criteria that affect the value of public real properties and they vary according to regions. To create the GeoValueIndex or apply the methods of mass appraisal, the data should be in a standard form and mathematical operations are performed with them.

Mersin University Çiftlikköy Campus is in the middle of rural and urban divide. The campus boundary is the study area and corresponds to a parcel in the zoning plan. Since there are already cadastral parcels on the ground, the processes are based on the cadastral parcel. The value index was obtained by creating a model between the criteria weights affecting the value and the data owned by the real properties. In other words, the real value of the real property has been found with the help of the features and their weights and it has been converted into an index. Each parcel has a GeoValueIndex that can generally remain constant. However, precedents, valuation dates and values are constantly changing. If one point can be kept constant in the real estate valuation, others can be returned to it. In this case, it means that the GeoValueIndex of the parcel can be transformed to the value on the valuation date. The real property can be matched by its unit square meter value and each other. Under the conditions that GeoValueIndex and the criteria remain constant, the values of the real property can be easily found at a past, future, and present date. In addition, an objective GeoValueIndex is obtained since the existing features of the real property are taken into account.

In future studies, it can be applied separately to real properties such as land, plot, residential, commercial and industrial, and can be tested with samples. The construction information in residential areas as a separate group can be investigated by considering the depreciation amount. The age of the tree can be found, the plant group can be distinguished, evaluated and examined according to the productivity rate. The weighting can be done by using different methods such as topsis, vikor, and best/worst from multi criteria decision making analysis.

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Rassegna giurisprudenziale I semestre 2023

a cura di Nicola Lucifero

AGRICOLTURA

CGUE, 29 giugno 2023, C-501-504/22

Rinvio pregiudiziale – Agricoltura e pesca – Organizzazione comune dei mercati – Regolamento (UE) n. 1308/2013 – Articolo 164, paragrafi 1 e 4 – Norme di commercializzazione – Estensione di un accordo interprofessionale – Accordo che prevede regole più restrittive rispetto alla normativa dell'Unione europea

1) L'articolo 164 del regolamento (UE) n. 1308/2013 del Parlamento europeo e del Consiglio, del 17 dicembre 2013, recante organizzazione comune dei mercati dei prodotti agricoli e che abroga i regolamenti (CEE) n. 922/72, (CEE) n. 234/79, (CE) n. 1037/2001 e (CE) n. 1234/2007 del Consiglio, deve essere interpretato nel senso che rientra nell'applicazione di tale articolo la fissazione – tramite accordo, decisione o pratica concordata adottati nell'ambito di un'organizzazione di produttori riconosciuta, di un'associazione di organizzazioni di produttori riconosciuta o di un'organizzazione interprofessionale riconosciuta – di date del raccolto o di date di commercializzazione di un prodotto agricolo.

2) L'articolo 164, paragrafi 1 e 4, del regolamento n. 1308/2013, deve essere interpretato nel senso cheuno Stato membro può, su domanda di un'organizzazione di produttori riconosciuta, di un'associazione di organizzazioni di produttori riconosciuta o di un'organizzazione interprofessionale riconosciuta, operante in una o più circoscrizioni economiche determinate di questo Stato membro e considerata rappresentativa della produzione, del commercio o della trasformazione di un dato prodotto, rendere obbligatori alcuni accordi, alcune decisioni o alcune pratiche concordate adottati nell'ambito di tale organizzazione di produttori, di tale associazione di organizzazioni di produttori o di tale organizzazione interprofessionale, nei confronti di altri operatori che operano nelle suddette circoscrizioni economiche e che non sono membri dell'organizzazione di produttori, dell'associazione di organizzazioni di produttori o dell'organizzazione interprofessionale in parola, nel caso in cui le regole previste da tali accordi, da tali decisioni o da tali pratiche concordate, vertenti su una o più materie tra quelle elencate al paragrafo 4, lettere a) e da c) ad n), del citato articolo 164, siano più rigorose rispetto a quelle previste dalle normative dell'Unione europea o dalle norme adottate dalla Commissione economica per l'Europa delle Nazioni Unite (UNECE).

CGUE, 15 giugno 2023, C-183/22

Rinvio pregiudiziale – Agricoltura – Organizzazione comune dei mercati – Regolamento (UE) n. 1308/2013 – Statuto delle organizzazioni di produttori – Articolo 153, paragrafo 1, lettera b) – Regola dell'appartenenza degli aderenti a una sola organizzazione di produttori – Portata – Articolo 153, paragrafo 2, lettera c) – Controllo democratico dell'organizzazione di produttori e delle decisioni prese in seno ad essa da parte degli aderenti produttori – Controllo esercitato da un soggetto su taluni aderenti dell'organizzazione di produttori

1) L'articolo 153, paragrafo 1, lettera b), del regolamento (UE) n. 1308/2013 del Parlamento europeo e del Consiglio, del 17 dicembre 2013, recante organizzazione comune dei mercati dei prodotti agricoli e che abroga i regolamenti (CEE) n. 922/72, (CEE) n. 234/79, (CE) n. 1037/2001 e (CE) n. 1234/2007 del Consiglio, come modificato dal regolamento (UE) 2017/2393 del Parlamento europeo e del Consiglio, del 13 dicembre 2017, deve essere interpretato nel senso che l'obbligo di appartenenza a una sola organizzazione di produttori riguarda esclusivamente gli aderenti di quest'ultima aventi la qualità di produttori.

2) L'articolo 153, paragrafo 2, lettera c), del regolamento n. 1308/2013, come modificato dal regolamento 2017/2393, deve essere interpretato nel senso che al fine di determinare se lo statuto di un'organizzazione di produttori contenga regole atte a consentire ai produttori aderenti di quest'ultima il controllo democratico della loro organizzazione e delle decisioni da essa prese, l'autorità nazionale incaricata del riconoscimento di tale organizzazione deve:

– esaminare se un soggetto controlli taluni aderenti dell'organizzazione di produttori tenendo conto non solo del fatto che tale soggetto detiene una partecipazione nel capitale sociale di detti aderenti, ma anche del fatto che detto soggetto intrattiene con essi altri tipi di rapporti, quali, nel caso di aderenti non produttori, l'appartenenza di questi ultimi alla medesima confederazione sindacale o, nel caso di aderenti produttori, l'esercizio, da parte di questi ultimi, delle responsabilità direttive in seno a una siffatta confederazione;

– dopo aver verificato che i produttori aderenti dell'organizzazione di produttori dispongano della maggioranza dei voti in seno all'assemblea generale dell'organizzazione, essa deve altresì esaminare se, alla luce della ripartizione dei voti tra gli aderenti che non sono controllati da altri soggetti, uno o più aderenti non produttori possano, a causa di un'influenza determinante che essi potrebbero in tal modo esercitare, controllare, anche senza maggioranza, le decisioni prese dall'organizzazione di produttori.

CGUE, 16/02/2023, C-343/21

Rinvio pregiudiziale – Politica agricola comune – Misure di sostegno allo sviluppo rurale da parte del Fondo europeo agricolo per lo sviluppo rurale – Pagamenti agroambientali – Regolamento (CE) n. 1974/2006 – Impossibilità per i beneficiari di continuare a rispettare gli impegni assunti – Nozioni di "operazione di ricomposizione fondiaria" e di "interventi di riassetto fondiario" – Assenza di misure necessarie per adeguare gli obblighi del beneficiario alla nuova situazione dell'azienda – Regolamento (CE) n. 1122/2009 – Nozione di "forza maggiore e circostanze eccezionali"

1) L'articolo 45, paragrafo 4, del regolamento (CE) n. 1974/2006 della Commissione, del 15 dicembre 2006, recante disposizioni di applicazione del regolamento (CE) n. 1698/2005 del Consiglio sul sostegno allo sviluppo rurale da parte del Fondo europeo agricolo per lo sviluppo rurale (FEASR), deve essere interpretato nel senso che esso è applicabile nel caso in cui un agricoltore si trovi nell'impossibilità di continuare a rispettare gli impegni agroambientali da esso assunti, per l'ultimo anno di esecuzione degli stessi, e tale impossibilità derivi direttamente da un'operazione di ricomposizione fondiaria o da un intervento di riassetto fondiario decisi o approvati da un'autorità pubblica competente, aventi un'incidenza sulla struttura dell'azienda agricola costituente l'oggetto degli impegni suddetti. Per contro, la disposizione sopra citata non è applicabile nel caso in cui detta impossibilità derivi dal venir meno del diritto di utilizzare una parte della superficie di tale azienda durante l'esecuzione degli impegni in parola.

2) L'articolo 45, paragrafo 4, del regolamento n. 1974/2006 deve essere interpretato nel senso che la mancata adozione, da parte di uno Stato membro, delle misure necessarie per permettere di adeguare gli impegni agroambientali di un beneficiario alla nuova situazione della sua azienda agricola risultante da un'operazione di ricomposizione fondiaria o da interventi di riassetto fondiario, ai sensi di detta disposizione, osta a che a tale beneficiario venga chiesto di rimborsare i fondi percepiti per il periodo durante il quale gli impegni in parola erano rispettati.

3) L'articolo 31 del regolamento (CE) n. 73/2009 del Consiglio, del 19 gennaio 2009, che stabilisce norme comuni relative ai regimi di sostegno diretto agli agricoltori nell'ambito della politica agricola comune e istituisce taluni regimi di sostegno a favore degli agricoltori, e che modifica i regolamenti (CE) n. 1290/2005, (CE) n. 247/2006, (CE) n. 378/2007 e abroga il regolamento (CE) n. 1782/2003, deve essere interpretato nel senso che se l'impossibilità, per un beneficiario, di continua-

re a rispettare un impegno agroambientale a causa della mancata conclusione di accordi con altri proprietari o utilizzatori di terreni agricoli per lo sfruttamento di questi ultimi può, in linea di principio, costituire una causa di forza maggiore, ciò vale soltanto a condizione che tale impossibilità sia dovuta a circostanze estranee a detto beneficiario, anomale e imprevedibili, le cui conseguenze non avrebbero potuto essere evitate malgrado tutta la diligenza impiegata dal beneficiario stesso, circostanza questa la cui verifica incombe al giudice del rinvio.

Corte cost., 13/04/2023, n. 68

Edilizia e urbanistica – Agricoltura – Norme della Regione Toscana – Attività agrituristica – Immobili destinati all'attività agrituristica – Previsione che possono essere utilizzati per l'attività agrituristica trasferimenti di volumetrie di cui agli artt. 71, c. 2, e 72, c. 1, lett. a), della l. reg.le n. 65 del 2014, all'interno del medesimo territorio comunale o all'interno della proprietà aziendale la cui superficie sia senza soluzione di continuità e ricada parzialmente in territori di Comuni confinanti, a condizione che si configurino come uno degli interventi specificati – Denunciata previsione di nuove edificazioni finalizzate all'attività agrituristica, in violazione dei limiti e dei parametri posti dalla legge n. 1150 del 1942 [Legge urbanistica] – Contrasto con i principi fondamentali in materia di governo del territorio di cui alla legge n. 1150 del 1942, che impongono il rispetto dei limiti inderogabili di densità edilizia, come declinati per le zone agricole dal decreto interministeriale Ministro lavori pubblici n. 1444 del 1968. Denunciata delocalizzazione di volumi originariamente esistenti in altre porzioni del territorio comunale o del territorio di altri Comuni – Elusione dei limiti all'edificazione residenziale in zona agricola – Incidenza sulla pianificazione paesaggistica – Contrasto con le previsioni del Codice dei beni culturali e del paesaggio – Violazione dell'impegno assunto dalla Regione con il Piano di indirizzo territoriale [PIT] a consentire l'edificazione di nuovi volumi in zona agricola in casi eccezionali e residuali – Abbassamento del livello della tutela del paesaggio.

L'art. 3 della legge n. 96 del 2006 delimita l'utilizzabilità degli edifici per finalità agrituristiche sotto un duplice profilo: da un lato, esso pone la condizione della necessaria "preesistenza" dell'edificio, o di una sua parte, rispetto all'inizio delle attività edificatorie; dall'altro lato, questa stessa condizione è riferita ad una precisa localizzazione sul territorio, là dove è stabilito che l'edificio utilizzabile per attività agrituristiche debba altresì essere ubicato "nel fondo". Va dunque dichiarata l'illegittimità costituzionale dell'art. 7, comma 1, della legge della Regione Toscana 24 maggio 2022, n. 15 poiché permette l'utilizzo di volumetrie trasferite "all'interno del medesimo territorio comunale o all'interno della proprietà aziendale la cui superficie sia senza soluzione di continuità e ricada parzialmente in territori di comuni confinanti", permettendo dunque di destinare all'attività agrituristica volumetrie provenienti da fondi agricoli diversi ed esterni e anche non limitrofi, rispetto a quello in cui è svolta l'attività imprenditoriale. Infatti, nel consentire anche l'utilizzo di volumi trasferiti "all'interno del medesimo territorio comunale", la disposizione regionale estende l'ambito territoriale di provenienza dei volumi che possono essere trasferiti: da quello corrispondente al fondo in cui è ubicata l'attività agrituristica – l'unico consentito dalla norma statale evocata quale parametro interposto – a quello dell'intero comune in cui tale fondo è localizzato.

Cass., 10/05/2023, n. 12721

Agricoltura – Fondo europeo agricolo di orientamento e garanzia (FEAOG) – Contributi dell'unione europea conseguenti a politica agricola comune (PAC) – Rapporti col credito dell'agricoltore – Compensazione c.d. impropria o atecnica – Ammissibilità – Condizioni – Unitarietà del rapporto

In tema di rapporti tra il credito dell'agricoltore a titolo di contributi dell'Unione europea conseguenti alla Politica agricola comune (Pac), ed i debiti dello stesso per prelievo supplementare relativo alle quote latte, è ammissibile la cd. compensazione impropria o atecnica, a condizione che il controcredito sia certo e liquido secondo la valutazione dei giudici di merito, incensurabile in sede di legittimità, a tal fine valorizzando l'unitarietà del rapporto, in base al quale il regime delle quote latte è parte integrante del sistema Pac, il cui corretto funzionamento complessivo postula l'effettività del recupero delle somme dovute dai produttori di latte che abbiano superato i limiti nazionali, mediante la previa verifica del Registro nazionale previsto dalla legge, nel quale sono inseriti i debiti e crediti dell'agricoltore, la cui compensazione è connaturata al sistema della Pac, come configurato dal diritto dell'Unione Europea.

Cass., 25/01/2023, n. 2322

Indebita percezione di finanziamenti – Giudizio relativo – Giudicato – Giudizio di opposizione ad ordinanza ingiunzione che irroga la sanzione – Incidenza del giudicato – Esclusione – Fondamento

Il giudicato formatosi nel giudizio per la restituzione di aiuti comunitari indebitamente percepiti non ha efficacia vincolante nel giudizio pendente relativo all'opposizione al provvedimento sanzionatorio, perché tra i due

giudizi non sussiste un nesso di pregiudizialità-dipendenza, che si ha soltanto quando un rapporto giuridico, pregiudiziale o condizionante, rientra nella fattispecie di altro rapporto giuridico, condizionato o dipendente. La sentenza che definisce il giudizio relativo all'indebita percezione degli aiuti non necessariamente contiene, infatti, l'accertamento della liceità (o illiceità) del comportamento del soggetto privato; la sanzione amministrativa, d'altro canto, non è condizionata alla fondatezza o meno della pretesa restitutoria, bensì alla commissione di un illecito il cui accertamento è oggetto del giudizio di opposizione alla sanzione.

Cons. Stato, 28/04/2023, n. 4273
Agevolazioni – Benefici comunitari e nazionali – posizioni soggettive – natura.
In tema di finanziamenti pubblici, è configurabile una situazione soggettiva di interesse legittimo, con conseguente giurisdizione del G.A. solo ove la controversia riguardi una fase procedimentale precedente al provvedimento discrezionale attributivo del beneficio, oppure quando, a seguito della concessione del beneficio, il provvedimento sia stato annullato o revocato per vizi di legittimità o per contrasto iniziale con il pubblico interesse, ma non per inadempienze del beneficiario. Invece, qualora la controversia attenga alla fase di erogazione o di ripetizione del contributo sul presupposto di un addotto inadempimento del beneficiario alle condizioni statuite in sede di erogazione o dall'acclarato sviamento dei fondi acquisiti rispetto al programma finanziato, la giurisdizione spetta al G.O., anche se si faccia questione di atti formalmente intitolati come revoca, decadenza o risoluzione, purché essi si fondino sull'inadempimento alle obbligazioni assunte di fronte alla concessione del contributo. In tal caso, infatti, il privato è titolare di un diritto soggettivo perfetto, come tale tutelabile dinanzi al G.O., attenendo la controversia alla fase esecutiva del rapporto di sovvenzione e all'inadempimento degli obblighi cui è subordinato il concreto provvedimento di attribuzione.

T.A.R. Piemonte Torino, 03/04/2023, n. 304
Agevolazioni – Trattenute sugli aiuti
In tema di quote latte, stante la molteplicità delle poste reciproche di dare e avere emergenti nell'ambito di un rapporto giuridico pluriennale, le trattenute sugli aiuti agricoli potrebbero essere state effettuare per compensare altri debiti del produttore. Poiché, mediante consultazione del registro nazionale dei debiti di cui all'art. 8-ter del D.L. n. 5 del 2009, il produttore ha piena contezza della propria posizione debitoria o creditoria verso l'Unione, questi è onerato di dimostrare che le trattenute subite sugli aiuti agricoli (poste di credito) si riferiscano al prelievo supplementare oggetto di giudizio e lo abbiano estinto, in tutto o in parte.

T.A.R. Lombardia Brescia, Sez. II, 02/01/2023, n. 2
Agevolazioni – Calcolo dei debiti – valutazione complessiva
In tema di quote latte non trova applicazione la disciplina relativa alla compensazione nazionale e la disciplina relativa al rimborso del prelievo in eccesso. Il ricalcolo dei debiti dei produttori deve essere complessivo ossia deve riguardare tutti i produttori convolti nelle operazioni di compensazione o di rimborso, per rideterminare in modo virtuale l'importo dovuto da ciascuno.

ALIMENTI

CGUE, 25/05/2023, C-141/22
Rinvio pregiudiziale – Sicurezza alimentare – Nuovi alimenti – Regolamento (UE) 2015/2283 – Farina di grano saraceno germogliato con elevato contenuto di spermidina – Germinazione di semi di grano saraceno in una soluzione nutritiva contenente spermidina
L'articolo 3, paragrafo 2, lettera a), iv), del regolamento (UE) 2015/2283 del Parlamento europeo e del Consiglio, del 25 novembre 2015, relativo ai nuovi alimenti e che modifica il regolamento (UE) n. 1169/2011 del Parlamento europeo e del Consiglio e abroga il regolamento (CE) n. 258/97 del Parlamento europeo e del Consiglio e il regolamento (CE) n. 1852/2001 della Commissione, deve essere interpretato nel senso che un alimento come una farina di grano saraceno germogliato con elevato contenuto di spermidina, non utilizzato in misura significativa per il consumo umano nell'Unione europea prima del 15 maggio 1997, costituisce un «nuovo alimento», ai sensi di tale disposizione, dato che, in primo luogo, esso è ottenuto da una pianta, in secondo luogo, non risulta che la sua sicurezza sia stata confermata dai dati relativi alla sua composizione e dall'esperienza che si può trarre dal suo uso continuato per almeno venticinque anni nella dieta abituale di un numero significativo di persone in almeno un paese dell'Unione e, in terzo luogo, comunque, esso non è ottenuto mediante una pratica di riproduzione, ai sensi di detta disposizione.

CGUE, 02/03/2023, C-760/21
Rinvio pregiudiziale – Sicurezza degli alimenti – Alimenti – Regolamento (UE) n. 609/2013 – Articolo 2, paragrafo 2, lettera g) – Nozione di "alimento a fini medici speciali" – Altre esigenze nutrizionali specifiche – Gestione dietetica – Modifica della dieta –

Sostanze nutrienti – Utilizzo sotto controllo medico – Ingredienti non assimilati o metabolizzati nel canale alimentare – Delimitazione rispetto ai medicinali – Delimitazione rispetto agli integratori alimentari

1) L'articolo 1, punto 2, della direttiva 2001/83/CE del Parlamento europeo e del Consiglio, del 6 novembre 2001, recante un codice comunitario relativo ai medicinali per uso umano, come modificata dalla direttiva 2004/27/CE del Parlamento europeo e del Consiglio, del 31 marzo 2004, e l'articolo 2, paragrafo 2, lettera g), del regolamento (UE) n. 609/2013 del Parlamento europeo e del Consiglio, del 12 giugno 2013, relativo agli alimenti destinati ai lattanti e ai bambini nella prima infanzia, agli alimenti a fini medici speciali e ai sostituti dell'intera razione alimentare giornaliera per il controllo del peso e che abroga la direttiva 92/52/CEE del Consiglio, le direttive 96/8/CE, 1999/21/CE, 2006/125/CE e 2006/141/CE della Commissione, la direttiva 2009/39/CE del Parlamento europeo e del Consiglio e i regolamenti (CE) n. 41/2009 e (CE) n. 953/2009 della Commissione devono essere interpretati nel senso che al fine di distinguere le nozioni di «medicinale» e di «alimento a fini medici speciali», definite rispettivamente in tali disposizioni, occorre valutare, alla luce della natura e delle caratteristiche del prodotto interessato, se si tratti di un alimento destinato a soddisfare le esigenze specifiche di una gestione dietetica oppure di un prodotto destinato a prevenire o curare malattie umane, a ripristinare, correggere o modificare funzioni fisiologiche esercitando un'azione farmacologica, immunologica o metabolica, ovvero a stabilire una diagnosi medica, o eventualmente presentato come tale.

2) L'articolo 2, paragrafo 2, lettera g), del regolamento n. 609/2013 deve essere interpretato nel senso che in primo luogo, la nozione di «gestione dietetica» ricomprende le esigenze – causate da una malattia, un disturbo o uno stato patologico – il cui soddisfacimento è indispensabile al paziente sotto l'aspetto nutrizionale; in secondo luogo, la qualificazione come «alimento a fini medici speciali» non può essere subordinata alla condizione che il soddisfacimento delle esigenze di «gestione dietetica» di una malattia, un disturbo o uno stato patologico, e, di conseguenza, l'effetto di tale prodotto abbiano luogo necessariamente durante o in seguito alla digestione e, in terzo luogo, la nozione di «modifica [esclusivamente] della normale dieta» comprende sia le situazioni in cui una modifica dell'alimentazione è impossibile o pericolosa per il paziente, sia quelle in cui per il paziente è molto difficile soddisfare le proprie esigenze nutrizionali con alimenti comuni.

3) L'articolo 2, paragrafo 2, lettera g), del regolamento n. 609/2013 deve essere interpretato nel senso che ai fini dell'applicazione di tale regolamento, che non definisce la nozione di «sostanza nutriente», occorre fare riferimento alla definizione di «sostanza nutritiva» quale compare all'articolo 2, paragrafo 2, lettera s), del regolamento (UE) n. 1169/2011 del Parlamento europeo e del Consiglio, del 25 ottobre 2011, relativo alla fornitura di informazioni sugli alimenti ai consumatori, che modifica i regolamenti (CE) n. 1924/2006 e (CE) n. 1925/2006 del Parlamento europeo e del Consiglio e abroga la direttiva 87/250/CEE della Commissione, la direttiva 90/496/CEE del Consiglio, la direttiva 1999/10/CE della Commissione, la direttiva 2000/13/CE del Parlamento europeo e del Consiglio, le direttive 2002/67/CE e 2008/5/CE della Commissione e il regolamento (CE) n. 608/2004 della Commissione.

4) L'articolo 2, paragrafo 2, lettera g), del regolamento n. 609/2013 deve essere interpretato nel senso che da un lato, un prodotto deve essere utilizzato sotto controllo medico se la raccomandazione e la successiva valutazione di un operatore sanitario sono necessarie in considerazione delle esigenze di gestione dietetica di una malattia, un disturbo o uno stato patologico particolari e degli effetti del prodotto sulle esigenze nutrizionali del paziente nonché su quest'ultimo e, dall'altro, il requisito secondo il quale un alimento a fini medici speciali è «da utilizzare sotto controllo medico» non è una condizione per la qualificazione come tale di un prodotto.

5) L'articolo 2 della direttiva 2002/46 e l'articolo 2, paragrafo 2, lettera g), del regolamento n. 609/2013 devono essere interpretati nel senso che le nozioni di «integratore alimentare» e di «alimento a fini medici speciali», definite rispettivamente in tali disposizioni, si escludono a vicenda e che è necessario determinare caso per caso e in funzione delle caratteristiche e delle condizioni di utilizzo se un prodotto rientri nell'una o nell'altra nozione.

Cass. pen., 26/04/2023, n. 26278

Sicurezza – responsabilità del produttore – rivenditore – esenzione

Ferma restando la responsabilità del produttore, il rivenditore o utilizzatore non risponde della detenzione per la vendita o della somministrazione di sostanze alimentari insudiciate, invase da parassiti, in stato di alterazione o, comunque, nocive, se queste gli siano state consegnate in confezioni originali sigillate, destinate ad essere aperte solo dal consumatore, le quali non rivelino esteriormente alcun vizio e per le quali l'analisi o qualsiasi altro appropriato controllo si risolverebbe, per la facile deperibilità del prodotto, nella non commestibilità di esso e, in pratica, nell'impossibilità di immetterlo al consumo. Al contrario, la responsabilità del rivenditore non è esclusa ove le condizioni di conservazione dell'alimento siano comunque agevolmente constatabili dall'esterno.

Cass. pen., 10/01/2023, n. 21182
Sicurezza – sostanza invasa da parassiti – accertamento
Ai fini della configurabilità del reato di detenzione per la vendita di prodotti alimentari "invasi da parassiti", di cui all'art. 5, comma 1, lett. d), L. 30 aprile 1962, n. 283, è necessario che risulti accertato, alla stregua di tutti gli elementi fattuali e di criteri non arbitrari, che i parassiti abbiano occupato in gran numero o riempito una sostanza alimentare, ma, la questione avente ad oggetto l'ampiezza della contaminazione costituisce questione di mero fatto non suscettibile di formare oggetto di ricorso per cassazione. La tematica in esame è fortemente condizionata dalla evidenza della presenza dei parassiti, dovendo essere tanto più rigoroso il giudizio sulla ricorrenza dell'essere la sostanza alimentare "invasa dai parassiti", quanto più questi elementi appaiono evidenti anche ad un primo esame visivo del prodotto. Il concetto di "invasione" non va inteso, in una sorta di concezione antropomorfica della fattispecie indotta dalla suggestione semantica del termine usato dal legislatore, come ampia diffusione dei parassiti sul prodotto, quasi che il termine evochi una specie di diffusa "occupazione territoriale" di esso da parte di tali elementi estranei, stando, invece, lo stesso a significare che il prodotto alimentare deve mostrare la presenza corpi estranei, provenienti dall'esterno di esso, appartenenti al mondo animale (per lo più insetti) o vegetale che, attraverso la loro intrusione all'interno del prodotto, dimostrino la mancanza del requisito della sicura e salubre perdurante destinazione del prodotto all'uso alimentare. È, pertanto, evidente che anche la presenza di uno solo di tali corpi estranei, se abbia la efficacia dimostrativa di cui sopra – ed è certo che la presenza di una blatta in un prodotto alimentare pronto per il consumo immediato sia espressiva di tale inidoneità – sia fattore idoneo ad integrare il concetto di "invasione" necessario ai fini della ricorrenza del reato.

Cass. pen., Sez. III, 20/01/2023, n. 13784
Sicurezza – impresa alimentare – responsabilità – legale rappresentante – delega di funzioni
In tema di reati in materia di alimenti, sulla base della disposizione di cui alla L. n. 283 del 1962, art. 5, comma 1, lett. b), della detenzione o somministrazione di un prodotto non conforme alla normativa deve rispondere, in caso di società o impresa, a titolo di colpa, il legale rappresentante della stessa, essendo allo stesso riconducibili le deficienze dell'organizzazione di impresa e la mancata vigilanza sull'operato del personale dipendente, salvo che il fatto illecito non appartenga in via esclusiva ai compiti di un preposto, appositamente delegato a tali mansioni, con l'ulteriore precisazione, tuttavia, che la delega di funzioni può operare quale limite della responsabilità penale del legale rappresentante dell'impresa solo laddove le dimensioni aziendali siano tali da giustificare la necessità di decentrare compiti e responsabilità, ma non anche in caso di organizzazione a struttura semplice.

ANIMALI

Cass. pen., 07/06/2023, n. 28036
Autorizzazione alle emissioni – pluralità di capannoni – unità aziendale – computo unitario dei capi.
Ai fini della necessità delle autorizzazioni alle emissioni, ove sia incontestata la riconducibilità di vari capannoni ad una gestione unitaria, lo «stabilimento» risulta unico anche in caso di totale indipendenza dei vari capannoni e, conseguentemente, il numero dei capi complessivo correttamente può essere computato sommando il numero di animali presenti in tutti i vari capannoni. L'unitarietà del complesso produttivo è connotata in particolare dall'unitarietà del registro di stalla e dalla sequenzialità dei codici identificativi Asl degli animali dei capannoni.

CACCIA E PESCA

Cass. pen., 08/02/2023, n. 10737
Uccellagione – Prelievo di uova, nidi e piccoli nati – Configurabilità della contravvenzione – Condizioni
Integra la contravvenzione di uccellagione, di cui all'art. 30, lett. e), legge 10 febbraio 1992, n. 157, la condotta di chi preleva uova, nidi o piccoli nati con mezzi diversi dalle armi da sparo e con potenzialità offensiva indeterminata, o che comporti una maggiore sofferenza per gli animali. (Dichiara inammissibile

Cass. civ., Sez. III, Ordinanza, 24/02/2023, n. 5733
Ordinamento amministrativo – Regioni – In genere – Fondi danneggiati dalla fauna selvatica – In zone di ripopolamento e cattura – Natura del contributo – Risarcitoria – Esclusione – Indennitaria – Sussistenza – Fondamento
In tema di danni alle colture provocati dalla fauna selvatica in zone di ripopolamento e cattura, il proprietario delle aree ha diritto ad un contributo a titolo di indennizzo, non predeterminato e comunque stabilito entro un tetto massimo, nei limiti delle disponibilità del relativo fondo regionale, e non al risarcimento dell'intero danno, in quanto, essendo la protezione della fauna selvatica un "valore", non si è in presenza di un risar-

cimento del danno da "fatto illecito", ma di una misura indennitaria frutto del bilanciamento tra i contrapposti interessi, parimenti meritevoli di tutela, della collettività al ripopolamento faunistico e dei coltivatori alla preservazione delle loro attività.

CONTRATTI AGRARI

Cass., 07/04/2023, n. 9604 (rv. 667400-01)

Diritto di prelazione e di riscatto – In genere – Art. 7 della legge n. 817 del 1971 – Spettanza del diritto di prelazione e riscatto al confinante nudo proprietario – Condizioni – Coltivazione diretta del fondo – Necessità – Modalità di accertamento

L'esercizio del diritto di prelazione agraria può essere consentito anche al nudo proprietario del fondo confinante con quello posto in vendita, essendo egli pur sempre titolare di un diritto di proprietà, seppure temporaneamente compresso dall'esistenza dell'altrui diritto reale sul medesimo bene, a condizione che coltivi legittimamente e direttamente il terreno da almeno due anni, in base ad un titolo legittimo, la cui ricorrenza – da accertarsi in concreto, potendo sussistere laddove l'usufruttuario abbia consentito la coltivazione – consente, in concorso con gli altri requisiti legali, l'operatività della prelazione e del riscatto.

Cass., 23/03/2023, n. 8323

Affitto di fondi rustici – Affitto a coltivatore diretto – Risoluzione – Inadempimento – In genere – Diffida ex art. 5, l. n. 203 del 1982 contenente pluralità di inadempimenti – Indicazione generica di alcuni di essi e sufficientemente specifica di altri – Proponibilità dell'azione- Condizioni e limiti – Affitto a coltivatore diretto – Risoluzione – Inadempimento – Contestazione.

In tema di affitto di fondo rustico, qualora il concedente abbia inviato una diffida ai sensi dell'art. 5 della l. n. 203 del 1982 adducendo una pluralità di inadempimenti dell'affittuario, alcuni dei quali indicati in modo sufficientemente specifico ed altri in maniera soltanto generica, il successivo esercizio dell'azione è proponibile limitatamente agli inadempimenti specificamente individuati (che all'affittuario ha avuto facoltà di sanare) sia nel caso in cui ognuno di essi risulti astrattamente idoneo a giustificare la risoluzione, sia se questa possa eventualmente essere dichiarata in base a una loro congiunta valutazione; l'azione è, invece, improponibile per gli inadempimenti indicati genericamente, ancorché l'atto introduttivo provveda a specificarli.

Cass., 13/03/2023, n. 7249

Diritto di prelazione e di riscatto – In genere – Riconoscimento giudiziale del diritto – Termine trimestrale per il pagamento del prezzo – Decorrenza – Dal passaggio in giudicato della sentenza incidente sul diritto del retrattante – Sussistenza – Dalla comunicazione del dispositivo – Insussistenza – Fondamento

In tema di retratto agrario, il termine trimestrale per il pagamento del prezzo decorre, ai sensi della l. n. 2 del 1979, dal passaggio in giudicato della sentenza che riconosce il diritto del retrattante e non dalla comunicazione di cancelleria dell'avvenuto deposito della sentenza; né può invocarsi, stante il chiaro disposto normativo, un'interpretazione costituzionalmente orientata che dia rilievo, ai fini della decorrenza del termine, al principio della conoscenza effettiva dell'atto, atteso che la data del deposito è facilmente conoscibile dalla parte attraverso l'acquisizione delle relative informazioni in cancelleria.

Cass., 02/03/2023, n. 6312

Affitto – soggetto diverso da coltivatore diretto – forma del contratto

In tema di contratto di affitto di fondo rustico a conduttore non coltivatore diretto, la disposizione dell'art. 3, comma 1, della L. n. 606 del 1996, là dove stabiliva il requisito della forma scritta *ad probationem* per tale contratto, deve considerarsi norma che, stabilendo una *lex specialis* circa la forma del contratto, prevale sulla disposizione del codice civile di cui all'art. 1350 n. 8 anche a seguito dell'entrata in vigore della norma dell'art. 22 della L. n. 203 del 1982, che ebbe a stabilire per detta tipologia di contratto agrario una durata di quindici anni.

CA Bari, 02/03/2023, n. 331

Prelazione – diritto di riscatto – insediamento di coltivatore diretto – onere della prova – vicinanza della prova – esclusione

In tema di prelazione agraria, l'onere di dimostrare che sul fondo oggetto di riscatto non sussista la condizione impeditiva dello stabile insediamento di un coltivatore diretto grava sul retraente, senza che possa trovare applicazione il principio di vicinanza della prova, non invocabile allorché le circostanze da provare rientrino nella piena conoscibilità ed accessibilità di entrambe le parti, come avviene con riferimento alle caratteristiche della situazione presa in esame dalla legge agraria, ovvero la contiguità dei fondi e l'attività lavorativa, svolta su quello confinante, da chi esercita il retratto.

T. Vicenza, 01/03/2023, n. 404
Agricoltura – ricorso per decreto ingiuntivo – mediazione – condizione di procedibilità – obbligo di esperimento prima della fase monitoria
In materia agraria, grava sulla parte che intenda proporre ricorso per decreto ingiuntivo a tutela di un diritto nascente da un rapporto agrario l'onere di esperire il preventivo tentativo di conciliazione, secondo quanto previsto dall'art. 11 del D. Lgs. 1 settembre 2011 n. 150, a pena di improponibilità della domanda, rilevabile di ufficio anche nel giudizio di opposizione. La "ratio" di tale principio poggia evidentemente sull'assunto per cui il tentativo conciliativo nei rapporti agrari è previsto espressamente dalla legge in via "preventiva", di talché costituisce ineludibile condizione di accesso alla tutela giurisdizionale "tout court". Più precisamente, la legge impone di esperire il suddetto tentativo conciliativo anche prima di attivare il procedimento monitorio e non solo prima di incardinare i processi ordinari, dal momento che anche il procedimento monitorio a cognizione sommaria può sfociare in un processo a cognizione piena in fase di opposizione, con la conseguenza che in queste ipotesi il tentativo conciliativo va naturalmente anticipato ancor prima della fase (monitoria), benché quest'ultima sia caratterizzata da un contraddittorio delle parti solo posticipato o eventuale.

IMPOSTE, TASSE E CONTRIBUTI

Cass. civ., 06/06/2023, n. 15764
Soccida – acquisto beni strumentali – IVA
Nel contratto agrario associativo di soccida l'acquisto di beni strumentali da parte del soccidario dà diritto alla detrazione IVA, in quanto egli, come il soccidante, è sia un autonomo imprenditore agricolo sia un distinto soggetto ai fini dell'IVA.

T.A.R. Veneto Venezia07/04/2023, n. 443
Agricoltura – Agevolazioni – Benefici comunitari e nazionali
In tema di impugnazione di intimazioni di pagamento, la mancata impugnazione tempestiva della presupposta cartella di pagamento, perché in ogni caso la riscossione non può essere proseguita per il venire meno del titolo giustificativo.

CTR Abruzzo L'Aquila, 09/01/2023, n. 12
Cooperative – IRES – esenzione – beneficiari attività
L'esenzione dall'IRES prevista dall'art. 10, D.P.R. n. 601/1973, a favore delle cooperative agricole e loro consorzi è riferita anche alle attività connesse all'agricoltura, ma pur sempre ed esclusivamente collegata all'attività agricola svolta in favore dei soci.

IMPRESA

Cass., 24/01/2023, n. 2153
Imprenditore agricolo – attività connesse – requisito oggettivo – prevalenza – accertamento
Ai sensi dell'art. 2135, comma 3, c.c., la connessione dal punto di vista oggettivo va intesa all'insegna del parametro della prevalenza, nel senso che non si fuoriesce dall'alveo dell'impresa agricola allorché le attività connesse (oggettivamente commerciali e rilevanti ciascuna di per sé) riguardino prodotti ottenuti in via preponderante dalla coltivazione del fondo o del bosco oppure dall'allevamento degli animali. Il rapporto di prevalenza si risolve in un giudizio comparativo di valenza economico-patrimoniale. La produzione ottenuta con l'attività agricola essenziale, in quanto espressione di attività imprenditoriale, ancorché agricola, è destinata, comunque e quanto meno (anche in assenza di manipolazione, conservazione, trasformazione e valorizzazione), alla commercializzazione, al mercato, dato che la destinazione al mercato è coessenziale alla nozione generale di imprenditore.

Cass., 17/01/2023, n. 1239
Imprenditore agricolo – attività connesse – vendita – oggetto
Ai fini dell'accertamento della natura agricola dell'impresa ai sensi dell'art. 2135 c.c. sono irrilevanti le modalità di vendita, dovendosi invece verificare se le attività connesse a quella agricola, fra le quali rientra la commercializzazione, abbiano o meno ad oggetto prodotti ottenuti prevalentemente dalla coltivazione del fondo. L'esenzione dell'imprenditore agricolo dal fallimento postula, in ossequio all'art. 2697, comma 2, c.c. e al principio di vicinanza alla prova, la dimostrazione da parte di chi la invoca della sussistenza delle condizioni per ricondurre l'attività di commercializzazione dei prodotti agricoli all'ambito di cui all'art. 2135, comma 3, c.c.

CA Catanzaro, 07/04/2023, n. 423
Lavoratori agricoli – prestazioni previdenziali – iscrizione nell'elenco – onere della prova
In materia di iscrizione negli elenchi dei lavoratori agricoli, il lavoratore deve fornire la prova della ricorrenza del rapporto di lavoro subordinato, qualora sia stato adottato nei suoi confronti un provvedimento di cancellazione dagli elenchi, mentre, nel caso in cui sia documentabile l'iscrizione, questa costituisce prova sufficiente

ai fini del riconoscimento del diritto alle prestazioni previdenziali richieste in giudizio, salvo che l'istituto previdenziale convenuto ne contesti le risultanze con il richiamo ad elementi di fatto (in particolare, al contenuto di accertamenti ispettivi o alla sussistenza di rapporti di parentela, affinità o coniugio, tra le parti), che possano far sorgere dubbi circa l'effettività del rapporto di lavoro o del suo carattere subordinato, nel qual caso il giudice non può risolvere la controversia in base al semplice riscontro dell'iscrizione, che resta pur sempre soltanto un meccanismo di agevolazione probatoria, ma deve pervenire alla decisione valutando liberamente e prudentemente la rispondenza dell'iscrizione stessa a dati obiettivi, al pari di tutti gli elementi probatori acquisiti alla causa.

T. Foggia, Sez. lavoro, Sentenza, 11/01/2023, n. 107
Coltivatore diretto – qualifica – tempo dedicato – accertamento
Ai fini della configurabilità della qualifica di coltivatore diretto il soggetto deve essere dedito alla diretta, abituale e manuale coltivazione dei fondi, ovvero dedito al governo abituale del bestiame; dette attività devono essere svolte in modo esclusivo o anche soltanto prevalente, cioè tale che le attività stesse lo impegnino per la maggior parte dell'anno e costituiscano per lui la maggior fonte di reddito.

MARCHI, PRIVATIVE E BREVETTI

CGUE, 16/03/2023, C-522/21
Proprietà intellettuale – Privativa per ritrovati vegetali – Regolamento (CE) n. 2100/94 – Deroga prevista dall'articolo 14, paragrafo 3 – Articolo 94, paragrafo 2 – Infrazione – Risarcimento – Regolamento (CE) n. 1768/95 – Articolo 18, paragrafo 2 – Risarcimento del danno – Importo forfettario minimo pari a quattro volte il canone di licenza – Competenza della Commissione europea – Invalidità
Ai sensi dell'articolo 13, paragrafo 2, del regolamento n. 2100/94, l'autorizzazione del titolare è richiesta, con riguardo ai costituenti varietali o al materiale del raccolto della varietà protetta, segnatamente ai fini della produzione o della riproduzione (moltiplicazione). Tuttavia, ai fini della salvaguardia della produzione agricola, l'articolo 14, paragrafo 1, di tale regolamento prevede che, in deroga all'obbligo di ottenere l'autorizzazione del titolare, gli agricoltori sono autorizzati ad utilizzare nei campi a fini di moltiplicazione, nelle loro aziende, il prodotto del raccolto che hanno ottenuto piantando, nelle loro aziende, materiale di moltiplicazione di una varietà protetta, inclusa nell'elenco delle specie di piante agricole enumerate all'articolo 14, paragrafo 2, di detto regolamento. L'applicazione di tale deroga è subordinata al ricorrere di talune condizioni. L'articolo 14, paragrafo 3, del regolamento n. 2100/94, da un lato, dispone che tali condizioni sono stabilite nelle norme di applicazione ai sensi dell'articolo 114 di tale regolamento, sulla base di criteri che consentono di applicare tale deroga e di salvaguardare i legittimi interessi del costitutore, definito all'articolo 11, paragrafo 1, di detto regolamento, e dell'agricoltore e, dall'altro, enuncia tali diversi criteri. Tra questi ultimi figura quello fissato all'articolo 14, paragrafo 3, quarto trattino, del medesimo regolamento, consistente nel pagamento, al titolare, di un'equa remunerazione derogatoria dovuta per tale utilizzo. Tale remunerazione deve essere sensibilmente inferiore all'importo del canone di licenza.

PROPRIETA'

T. Nuoro, 15/03/2023, n. 137
Usucapione – requisito soggettivo – coltivazione del fondo – esclusione
Ai fini della prova degli elementi costitutivi dell'usucapione, il cui onere grava su chi invoca la fattispecie acquisitiva, la coltivazione del fondo non è sufficiente, perché, di per sé, non esprime, in modo inequivocabile, l'intento del coltivatore di possedere, occorrendo, invece, che tale attività materiale, corrispondente all'esercizio del diritto di proprietà, sia accompagnata da univoci indizi, i quali consentano di presumere che essa è svolta "uti dominus"; l'interversione nel possesso non può avere luogo mediante un semplice atto di volizione interna, ma deve estrinsecarsi in una manifestazione esteriore, dalla quale sia possibile desumere che il detentore abbia iniziato ad esercitare il potere di fatto sulla cosa esclusivamente in nome proprio e non più in nome altrui e detta manifestazione deve essere rivolta specificamente contro il possessore, in maniera che questi sia posto in grado di rendersi conto dell'avvenuto mutamento e della concreta opposizione al suo possesso.

T. Velletri, 03/02/2023, n. 201
Usucapione speciale – piccola proprietà rurale – destinazione del fondo – concreto esercizio dell'attività agricola
Ai fini dell'applicabilità della disciplina dell'usucapione speciale per la piccola proprietà rurale di cui all'art. 1159 bis c.c. è necessaria una serie di requisiti specifici; in particolare, non è sufficiente che il fondo sia classificato come rustico, occorrendo, altresì, che lo stesso sia desti-

nato in concreto all'attività agraria, atteso che tale usucapione può avere ad oggetto soltanto un fondo rustico inteso come entità agricola ben individuata ed organizzata, che sia destinata ed ordinata a una propria vicenda produttiva.

USI CIVICI

Corte cost., 15/06/2023, n. 119

Usi civici – Domini collettivi – Disciplina – Beni collettivi – Previsione la quale, nel disporre che il regime giuridico di tali beni resta quello dell'inalienabilità, non esclude dalla relativa applicazione i domini collettivi, di cui alla lett. d) del c. 1 dell'art. 3 della legge n. 168 del 2017, vale a dire le terre di proprietà di soggetti pubblici o privati, sulle quali i residenti del Comune o della frazione esercitano usi civici non ancora liquidati – Denunciata disciplina che regola in modo eguale situazioni giuridiche differenti, assoggettando al medesimo regime sia i medesimi domini collettivi sia quelli costituenti il demanio civico – Previsione che, non consentendo alcuna regolamentazione delle terre private gravate da usi civici e soggette a esecuzione forzata, manifesta una irragionevolezza, non corrispondendo a tale divieto di alienazione alcun apprezzabile interesse della collettività che si intende tutelare – Sproporzionata compressione dei diritti del ceto creditorio garantito dai beni del proprietario-debitore, anche nelle ipotesi in cui il diritto di credito derivi da esigenze primarie, espressione di diritti costituzionali quali il diritto alla retribuzione o al mantenimento – Assenza di una procedura di indennizzo che impedisce al ceto creditorio di concentrare le proprie pretese su tale indennità – Equiparazione del regime giuridico delle terre private gravate da uso civico a quello relativo ai domini collettivi costituenti il demanio civico che incide sul contenuto del diritto di proprietà, limitandone l'esercizio ed equiparando il proprietario alla condizione dell'occupante in attesa di legittimazione.

Il tenore letterale dell'art. 3, comma 3, della legge n. 168 del 2017, nel suo coordinamento con il comma 1, e la ratio che si inferisce dal complesso della nuova disciplina comprovano che la proprietà privata gravata da usi civici non ancora liquidati sia "divenuta" inalienabile in forza di una norma avente carattere innovativo rispetto alla precedente disciplina. L'inalienabilità regola un profilo della proprietà privata gravata da usi civici non ancora liquidati che, sotto qualunque prospettiva lo si consideri, si dimostra totalmente estraneo alla tutela di interessi generali. Ne discende una irragionevole conformazione e, di riflesso, una illegittima compressione della proprietà privata, tanto più ingiustificata, in quanto viene introdotta ex novo proprio dalla medesima legge, che contestualmente potenzia gli strumenti conformativi della proprietà privata. Con la nuova disciplina di cui all'art. 3 citato, infatti, il proprietario non è più tenuto solo a preservare gli usi civici, che gravano sul suo fondo, e a corrispondere per la loro eventuale liquidazione un valore costituito da una parte del fondo o da un canone enfiteutico o dall'intera proprietà, salva l'acquisizione di un credito corrispettivo, ma, anche dopo aver liberato il terreno dal diritto collettivo, resta ancora vincolato alla conservazione dell'interesse paesistico-ambientale che, attraverso la memoria della pregressa presenza degli usi civici, intende dare continuità al valore paesaggistico in precedenza tutelato. Va dichiarata pertanto l'illegittimità costituzionale dell'art. 3, comma 3, della legge 20 novembre 2017, n. 168, nella parte in cui, riferendosi ai beni indicati dall'art. 3, comma 1, non esclude dal regime della inalienabilità le terre di proprietà di privati, sulle quali i residenti del comune o della frazione esercitano usi civici non ancora liquidati.

Cass., Sez. Unite, 10/05/2023, n. 12570

Bene gravato da uso civico di dominio della collettività – Assoggettabilità ad espropriazione per pubblica utilità – Condizioni – Previa formale sdemanializzazione – Necessità – Dichiarazione di pubblica utilità o provvedimento di espropriazione – Irrilevanza – Conseguenze

I diritti di uso civico gravanti su beni collettivi non possono essere posti nel nulla (ovvero considerati implicitamente estinti) per effetto di un decreto di espropriazione per pubblica utilità, poiché la loro natura giuridica assimilabile a quella demaniale lo impedisce, essendo, perciò, necessario, per l'attuazione di una siffatta forma di espropriazione, un formale provvedimento di sdemanializzazione, la cui mancanza rende invalido il citato decreto espropriativo che implichi l'estinzione di eventuali usi civici di questo tipo ed il correlato trasferimento dei relativi diritti sull'indennità di espropriazione.

Cass., Sez. Unite, 22/03/2023, n. 8252

Giurisdizione ordinaria e amministrativa – Usi civici – Accertamento della "qualitas soli" – Giurisdizione del commissario regionale per la liquidazione degli usi civici – Sussistenza – Condizioni – Fattispecie

La giurisdizione del Commissario regionale per la liquidazione degli usi civici, prevista dall'art. 29 della l. n. 1766 del 1927, sussiste ogniqualvolta l'accertamento della "qualitas soli" – e quindi la soluzione delle questioni relative all'accertamento dell'esistenza, della natura e dell'estensione dei diritti di uso civico, nonché di quel-

le relative alla qualità demaniale del suolo – si ponga come antecedente logico giuridico della decisione; sussiste, invece, la giurisdizione del giudice amministrativo quando le domande sono dirette a censurare l'"iter" procedimentale, in via preventiva rispetto ad ogni indagine sulla qualità demaniale e collettiva dei terreni. (In applicazione del principio, la S.C. ha regolato la giurisdizione a favore del Commissario regionale per gli usi civici in un caso in cui il piano di sviluppo del comprensorio sciistico del monte Terminillo formava oggetto di questioni attinenti alla natura civico-demaniale di alcuni fondi e alla presenza di autorizzazioni al relativo cambio d'uso).

Cass., 23/01/2023, n. 1986

Occupazioni e legittimazioni – Usi civici – Giudizio intentato dalla concessionaria dell'anas per far accertare che una strada non appartiene al demanio civico – Legittimazione ad agire in capo alla concessionaria – Esclusione – Fondamento

In tema di usi civici, è esclusa la legittimazione della concessionaria dell'ANAS ad agire per far accertare la non appartenenza di una strada al demanio civico del comune nel caso in cui, alla luce dell'art. 14, comma 3, C.d.S. e della convenzione conclusa tra l'ANAS e la concessionaria, quest'ultima assuma la veste di mera detentrice alla quale siano conferiti poteri di autotutela connessi alle funzioni di polizia demaniale e alla manutenzione autostradale, ma non poteri che investano la tutela della proprietà.

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