

THE REALIZATION OF SYSTEMATIC CADASTRE WORKS IN THE PERSPECTIVE OF THE SUSTAINABLE DEVELOPMENT OF THE VINEYARD AND FRUIT-GROWING SECTOR IN ROMANIA

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ABSTRACT. In order to develop the vineyard and orchard sector in Romania from a sustainable point of view, the European Union primarily finances plantations with native varieties. To be able to talk about sustainable development and environmental protection, GIS systems should be structured by fields of activity and become an interface between man and nature. The integration of these projects within the systematic cadastre work would have the effect of obtaining a better reassessment of the agricultural potential of the area. Thus, the "Vasile Adamachi" didactic farm of the Iasi University of Life Sciences has reconfigured the cadastral plots, currently occupying a total area of 16.1 ha with vines and 12.2 ha with fruit trees. This project to modernise the vineyard/fruit-growing plantations was realised from the rehabilitation funds of the European Union, through the Payments and Intervention Agency for Agriculture. The

creation by the Cadastre and Real Estate Publicity Agency of an integrated cadastre and land book system, as a "multipurpose" type system within the National Cadastre and Land Book Program, would help the Payments and Intervention Agency for Agriculture to identify agricultural real estate, which includes vineyards/fruit trees, and would encourage the owners of such plantations to access projects from the European Union funds for the modernisation, maintenance in good condition or expansion of vineyard and fruit-growing. Also, the technical-legal situation of the existing real estate at the administrative-territorial unit level could be obtained in real time.

Keywords: systematic cadastre works; tabulated agricultural real estate; vineyard and fruit-growing cadastral plots.



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INTRODUCTION

The objective of the General Cadastre is to manage Romania's land fund, obtained from real and correct technical data at the level of each administrative territory of the country. Unfortunately, unlike most member states of the European Union, Romania does not yet have a general cadastre of the land fund, which should contain essential data regarding the technical, economic and legal situation of properties in the public and private domain, at the administrative territory level.

Based on the primary data of the General Cadastre, Cadastral Information Systems can be created for fields of activity, previously called specialised cadastral records. From the cadastral records data, the General Cadastral Information System, centralised and selectively processed, can result in maps and topographic-cadastral plans specific to each field of economic activity. The purpose of these systems is to provide real data regarding land and constructions of any nature and their owners or possessors, to evaluate them, capitalise them as effectively as possible, establish the right tax, etc.

Only through the introduction of Cadastral Information Systems by fields of activity and the analysis over time of how resources are used, can we speak of sustainable development and the protection of the environment, becoming an interface between humans and nature (Dragomir *et al.*, 2000).

The National Agency for Cadastre and Land Registration (ANCPPI) proposes through the National Cadastre and Land Book Program (PNCCF) to create an integrated cadastre and land registry

system, which has as a priority "increasing the degree of coverage and inclusion of the property registration system in rural areas from Romania", and "the geographical extension of the property registration system in the cadastre and the land book", through the systematic registration of all real estate throughout the territory of Romania at the level of the current administrative organization.

By carrying out these systematic cadastral works at the level of administrative-territorial units and/or cadastral sectors, the real estate database is obtained, complying with Law no. 7/1996, published with subsequent amendments and additions (Badea, 2018; Radu, 2022). Thus, this program will support agriculture, infrastructure and the economy in general (Ciani *et al.*, 2011).

To obtain a modern system of General Cadastre and Real Estate Advertising and an agricultural cadastre Informational System, it is necessary to make new topographic and geodetic measurements on which to perform accurate cartography of cadastral territories, real estate and ownership registration, in a unique land book system, across the entire national territory (Busko and Apollo, 2023).

In its turn, the agricultural cadastre Informational System consists of five subsystems (Agricultural Informational System, Pasture Informational System, Hay Informational System, Vineyard Informational System and Orchard Informational System), each containing technical data and specific information, following technical standards of achievement and maintenance.

The new topographic cadastral measurements and realisation by the

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cartography of the property will ensure the necessary database for the introduction of the general and agricultural cadastre, and also of the real estate advertising cadastre, from the existing administrative territories in Romania.

Obtaining the cadastral plans requires the use of modern technologies, in the field phase for measurement of the geometric elements, and in the desk phase (calculations), which will produce a database for the Cadastral Informational System.

In order to achieve a unified and homogeneous General Cadastre of the country, as well as the Geographical Information Systems (GIS) by fields of activity, ANCPPI (2015) established the following implementation strategies, until the year 2030:

- the application in Romania of the principles of the "Cadastral Declaration from the European Union", adopted at the 2002 Cadastral Congress (Granada, Spain);

- the realisation of the national spatial geodetic network of classes A, B and C, through GPS determinations, ensuring at least 3 geodetic points on the surface of each administrative territory, which will serve the cadastre entry works;

- the integration of the national GPS geodetic network of class A, in the European reference system ETRS'89;

- integration of the class B geodetic network into the National Geodetic Fund;

- the development by ANCPPI (2015) of a network of permanent GPS stations, ensuring an average density of 1 station/2 000 km²;

- elaboration of the atlas of conventional signs at the European level,

for the digital mapping of topographic and cadastral maps and plans;

- the standardisation of geospatial information by adopting the European reference systems and the parameters and transformation functions between these systems;

- standardisation of the entries in the land book of immovable property and the owner's title to the registered immovables;

- providing online access for users to the existing database at the Office for Cadastre and Land Registration;

- realisation of the information system for the transfer of cadastral documents in electronic format;

- creating a system for assessing the taxable value of real estate to properly tax real estate;

- the complete privatisation of cadastral works, except for those regarding objectives that serve national security;

- creating a general cadastre and the real cadastral database, including the opening of land records based on the data of this cadastre;

- mapping and pedological assessment of agricultural land, for the most correct property taxation;

- realization of the information system of the cadastre and real estate advertising at the level of administrative-territorial units and ensuring access to this system for users;

- continuous updating of the general cadastre and geographic information systems specific to the fields of activity to avoid information becoming obsolete (Mika *et al.*, 2020).

The realisation of the Information System of the cadastre and real estate

advertising, at the level of the administrative-territorial units of the counties and of the entire country, will be accompanied by support, maintenance and continuous updating works to avoid the information from the specific databases becoming obsolete (Roic *et al.*, 2021).

Due to the changes produced in the cadastral data from the land register approved by the Office for Cadastre and Land Registration of Iasi, through the implementation of projects for the establishment of new vineyard/fruit-growing plantations to replace the aging plantations located on the area of the "V. Adamachi" didactic farm of the University of Life Sciences Iasi, the existing land registers must be updated. The implementation of the projects was carried out from European funds through the Payments and Intervention Agency for Agriculture Iasi, which required the approval of the establishment of new vineyard/fruit-growing plantations in compliance with European Union legislation.

Thus, in order to use it as efficiently as possible from an agricultural point of view, the teaching staff of the viticulture and fruit-growing department took into account the classes of suitability and favourability offered by the slope, with sunny exposure favourable to the varieties that have best adapted to the climatic zone offered by the Moldova plateau.

At the same time, it is necessary to correlate the legislation in Romania with that of the European Union, as when the owners of agricultural land declare new vineyards/fruit-growing, established with their own funds, to the Office for Cadastre and Land Registration and to the

General Directorate of Economic and Local Public Finances, located within the administrative-territorial unit, these state institutions must be able to ask the applicant for documents to certify that the locations chosen for the new plantations are favourable in order to approve the application.

MATERIALS AND METHODS

The objective of introducing the cadastre is to enable registration in the real estate advertising register on the level of administrative-territorial units. Obtaining the cadastral plans, which ensure the agricultural and general cadastre's geospatial database, requires modern technologies, with automated acquisition, processing, exploitation and updating in all work phases. To achieve the Vineyard/Orchard Informational System objectives, data processing and programs for the editing of digital plans were used in making geographic topographical measurements.

The "V. Adamachi" didactic farm of the Iasi University of Life Sciences is identified on the geoportal of the National Agency for Cadastre and Land Registration as real estate, through the cadastral numbers 145,973, 140,621 and 135,187 of three land registers (*Figure 1*). The total area of the real estate resulting from the three land records is 51.1368 ha.

The real estate is composed of three land records because the western area included in the cadastral number 145,973 is separated from the rest of the land of the real estate due to the public utility of Podgoriilor Street, and the area included in the cadastral number 135,187 at the date of registration in 2005 was outside the Municipality of Iasi.

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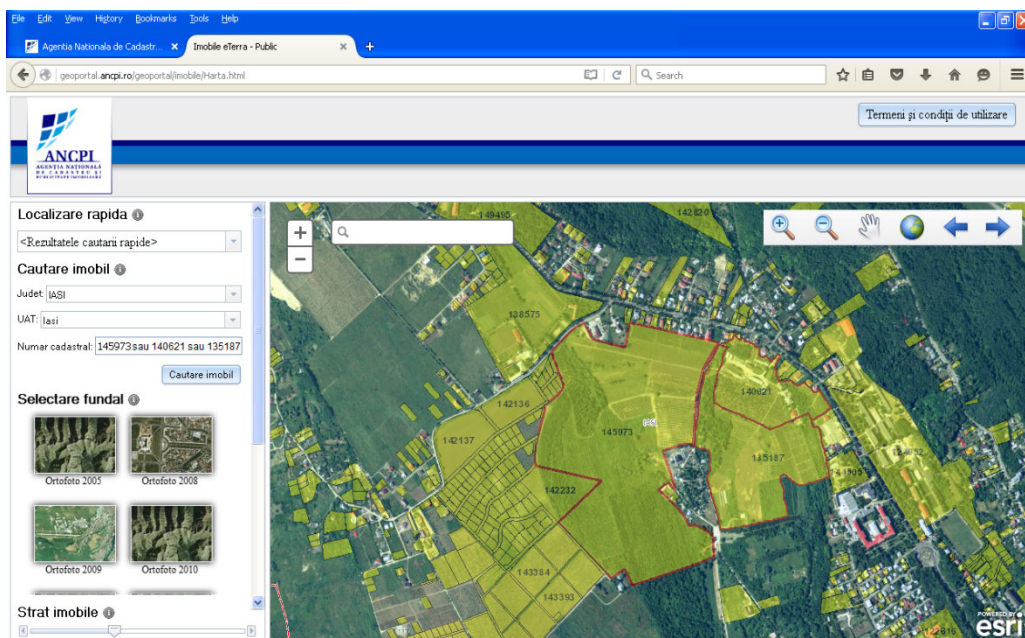


Figure 1 – Location of the listed property, on the geoportals of the National Agency for Cadastre and Land Registration, according to the cadastral numbers, within an administrative-territorial unit (UAT)

Starting from 2007, however, the areas identified on the geoportals of the National Agency for Cadastre and Land Registration with cadastral numbers 145,973 and 135,187, with a total area of 45 ha, were included in the extended urban area of the Municipality of Iasi, based on the General Urban Plan of the City Hall of Iasi.

The projects to maintain in good condition, modernise or expand the vineyard and fruit-growing plantations were carried out on an area of 16.1 ha of vines and 12.2 ha of fruit trees, followed according to the relief of the site and the efficiency of the mechanised technologies used in the work, by reconfiguring the vineyard/fruit orchard plots into larger areas (Huțanu, 2014).

By accessing the geoportals, one can see the mosaic of tabulated cadastral

parcels, overlain on the satellite image, for which the technical and legal situation has been established in the territory by the Office for Cadastre and Land Registration. This integrated cadastre and land book system is to be developed as a "multipurpose" type system, using an inventory based on systematic cadastre works and untabulated agricultural plots, establishing only the technical and economic situation (Iordan *et al.*, 2013; Popescu, 2015; Rakusa *et al.*, 2021). Making the information on the "multipurpose" type system available to local and/or county public institutions will make it possible to identify the legal or individual persons responsible for the agricultural plots, in order to encourage them to access non-refundable funds for the sustainable development of the administrative-territorial unit (Burja and

Burja, 2014; Rakusa *et al.*, 2021; Zărnescu *et al.*, 2019).

Because the work of introducing the general cadastre cannot be done simultaneously for all the communes, cities and municipalities of a county due to financial reasons and the specialised workforce required, the general director of the Office for Cadastre and Land Registration (OCPI) periodically establishes, by common agreement with the National Office for Cadastre, Geodesy and Cartography (ONCGC), the number and succession of administrative units. In selecting these, the following will be taken into account: the priority of the available funds, the size and complexity of the administrative-territorial units, the existing cartographic documentation, the state of the geodetic network in the area, the interest shown by the local authorities, the available specialised workforce etc.

Also, the National Cadastre and Land Book Program (PNCCF) aims to clarify the legal situation of properties owned without documents, so that they can be registered in the integrated cadastre and land book system.

At the same time, a more efficient way of capitalising on existing graphic and non-graphic information at the level of vineyard/fruit-growing real estate is proposed, both by owners/holders and by state institutions, for the sustainable development of these sectors.

The approval of the cadastral documentation by the OCPI involves a procedure of verifying the technical information provided by the location and delimitation plan of the land register, obtained on the basis of topographical measurements made in the field, together with the verification of the legal

information attesting the ownership of the real estate.

Based on the cadastral numbers identified on the ANCPI geoportal, a request was made for the three land registers existing at the OCPI in Iasi from 2005, submitted by PhD Prof. Eng. Popia Adrian-Constantin (deceased), from the "Gheorghe Asachi" Technical University of Iasi. When carrying out the topographical measurements from the field, PhD Prof. Eng. Popia Adrian-Constantin collaborated with the teaching staff from the Department of Topography and Cadastre of the Iasi University of Life Sciences - PhD Prof. Eng. Moca Valeriu (deceased) and the authors of this article. The updating in 2021 of the cadastral data was carried out on the basis of topographical measurements in the field by the authors of the article, with the help of the existing equipment at the department where we carried out our teaching activities. This equipment comprised a TC 705 Leica Geosystems total station and GPS Stonex S7G4083040007. These were used to ensure the accuracy of the 2D topographic measurements, as required by the technical rules for drawing up the site plan and delimitation of the land records, as well as for the 3D positioning of the points in the case of topographic surveys.

RESULTS

Based on the topographical measurements from the land carried out in 2021, the location and delimitation plan of the real estate were updated, and based on the coordinates of the elevation points of the land, it was possible to represent the relief through level curves. In order to obtain a revalorisation of the

agricultural land, under the administration of the "V. Adamachi" didactic farm of the Iasi University of Life Sciences, which has the configuration of an amphitheatre, plots occupied with vine plantations were reconfigured on an area of 16.1 ha and with fruit trees on 12.2 ha, using non-refundable funds from the Payments and Intervention Agency for Agriculture. The emplacement plan shows also the land relief by means of level curves, whose normal equidistance is $E_n = 5$ m, having the Black Sea as the reference plan for bench marks. For a better overview of the real estate, the graphic information was combined in a single drawing (*Figure 2*).

When developing projects for the plantations of vineyards/orchards, the following were taken into account:

- the ecological factors that define the geographical area of north-eastern Romanian viticulture/fruit-growing and influence growth and fruiting (Irimia *et al.*, 2012; Popescu, 2021);

- pedoclimatic conditions specific to the area when choosing grape varieties/fruit trees (David *et al.*, 2023; Tissot *et al.*, 2020);

- varieties resistant to diseases and frost in order to obtain higher quality harvests (Irimia *et al.*, 2012);

- anti-erosion measures to combat soil erosion by planting rows in the general direction of contour lines;

- increasing the yield of mechanised works by reconfiguring plots in larger areas depending on the slope of the relief (Irimia and Patriche, 2011).

If, within the systematic cadastral works carried out at the administrative-territorial unit level, the technical-legal information on the existing real estate in the cadastral/topographic plan also

contains specialised data related to the cadastral record, the Payments and Intervention Agency for Agriculture can access, as useful information, the plantation status and plantation gaps. By reconfiguring the plots occupied with vineyard/fruit trees plantations (Huțanu *et al.*, 2016), larger plots were obtained, with an average area of 0.8 ha (*Figure 3*). At the same time, it would be useful to develop a Geographic Information System (GIS) equipped with functions to create, manage and process the digital cadastral plans, the orthophoto images, the Terrain Digital Model and the Data Bank. The validation and generation of the data, in the concept of a relational database, is done through topological management functions and parallel updating of the graphical data with the information from the database. The generation of level curves plans is done in the form of 2D and/or 3D models, through interactive functions, allowing the creation of the Terrain Digital Model (Doner, 2021). For fairer management, from an administrative and economic point of view, of the Informational Systems by field activity, on the level of territorial-administrative units of the counties and of the whole country, the General Cadastre introduction must be completed. Therewith, also standardisation of the means for updating the systems must be ensured, and continuously maintained, to avoid the expiration of data from the database. For example, only by managing a database of the Agricultural (Vineyard/ Orchards) Informational System to be as true and correct as possible, can the real potential of an area be established, for more efficient management and exploitation.

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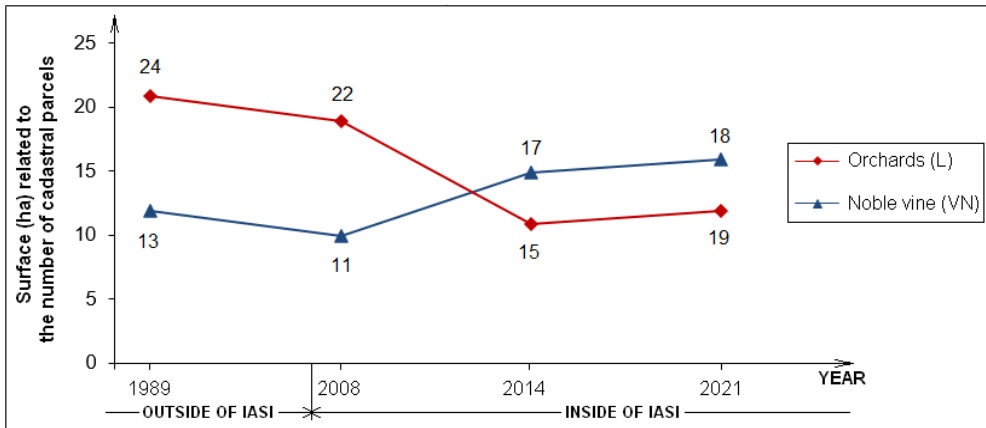


Figure 3 – The dynamics of the areas of vineyard/fruit-growing plantations in relation to the number of cadastral parcels of the studied agricultural property

Thus, the GIS software falls within the action to modernise services for smooth and fast solving of the various problems that may occur in the territory to stimulate the housing market and investment (Badea, 2018).

For example, the GIS program should provide data for:

- the preparation for the UAT of a digital cadastral plan in 2D format with the limits of the cadastral sectors, the property bodies and cadastral plots, together with a topographic cadastral digital plan with level curves in 3D format, to create a Terrain Numeric Model (TNM), which is extremely important for the study of the terrain, in the vineyard area, and a 3D colour model, according with the altitude of the determined points, for creating a relief and slope cartogram of the vineyard unit, to obtain information regarding the introduction of the vineyard cadastre;
- the updating of the cadastral digital plan based on the dismemberments approved by the Office for Cadastre and Land Registration and cadastral data of

the general technical cadastre received for each UAT;

- the identification and enumeration of updated legal regulations, concerning the methodology, the implementation and maintenance of introduction works of agricultural and general cadastre, for the Vineyard/Orchards Informational System. By realising these informational systems, based on domain-specific methodology, the conditions are created for unitary establishment of the quality elements necessary for the evaluation of terrains, the creation of a just base for the establishment of dues and taxes, and also for optimised terrain utilisation;

- the implementation of the stipulations of the mentioned methodology, by creating a computerised application based on using the GIS software that allows for efficient and quick generation of the digital plan and conducting the training, use and querying of spatial reference data;

- the study of the mode of designing and modelling a modern and unitary Vineyard/Orchards Informational System that respects the requirements of the

European Union and also the introduction rules of agricultural and general cadastre and offers good functionality in all phases of use of the spatial information;

- the development of a database, in a single GIS application, that allows cadastral and real estate data management, with the accent on the presentation of fundamental concepts regarding the modelling of data structures and statistical queries;

- the correct integration of the graphical data necessary for the preparation of digital cadastral plans, due to the performance of the measurement equipment, by strengthening the support and networks of points identified in the field by topographic landmarks, based on the triangulation network and main GPS network of each UAT;

- the data resulting from the land book documentation shows the situation, by fields and plots, of the use categories and the cadastral plots, as well as the distribution of cadastral plots by agricultural use and by the plots' average slope. Based on this data, utilisation by the European Union of the Agricultural Informational System becomes possible, for the support of farmers from Romania, through the Payments and Intervention Agency for Agriculture (APIA);

- the analysis of ways of exploiting and maintaining the vineyard/orchards cadastre of a vineyard/fruit tree unit, by presenting the locations of different varieties in the work fields, the distribution of dominant varieties, on automated work fields, the degree of occupation of the dominant varieties, together with the technical documentation of the Vineyard/Orchards Cadastral Informational System, related to the property sheet;

- the establishment of the economic value of the terrains and constructions in a unitary way, through cadastral evaluation of the agricultural fields, of the favourability classes, of the suitability of agricultural uses, together with the construction's terrains and evaluation of the constructions;

- the specification of the importance of legal cadastre, by identifying the real estate and owners, and the establishment of property rights, legal relations and real estate advertising systems, especially the land book;

- the creation of a 3D model and slopes cartogram from the vineyard unit and slope orientation relative to the sun;

- the statistical study of the dynamics in time of the plots areas and the use categories and owners;

- the realisation of the Agricultural Informational System, with presentation of the technical operations involved in creating the data bank, specific to each field, for the storage, management and querying of the cadastral database;

- the development of GIS software, as a modern and unitary system, in compliance with European Union requirements and national rules;

- the possibility of modifying the data structure in conjunction with legal changes, for the revaluation to date of the terrains for agricultural and/or urban purposes (Dolejs *et al.*, 2019).

- Internet access to the application data to enable them to be exploited by users in other platforms and systems applications;

- the possibility of creating informational systems specific to other fields of activity, such as: transport routes, water bodies and forests, tourism, industrial enterprises and protected areas;

- if the real estate summary made for each cadastral plot is completed with documentation, in scanned form, that evidences the property rights establishing the legal status of the terrain, then this Cadastral Informational System can be successfully used by the Plots Identification Service, from the Payments and Intervention Agency for Agriculture (APIA);

- the development of 2D+T and 3D+T applications that contain the general cadastre data, allowing the study of the evolution in time of the changes made in the mode of using the terrain, the plot sizes, and determination of the owners (Paasch *et al.*, 2021).

This GIS software, finally, enhances the quality of services offered to many recipients, by providing a database that is as complex as possible, permanently updated, and at a minimum cost.

If, when the systematic cadastre started within the National Cadastre and Land Book Program (PNCCF) is carried out, the basic and specialised cadastral data established at the level of each plot will be obtainable through a model document, generically named "Summary of the cadastral plot", for example, "Summary of the vineyard cadastral plot" (*Table 1*) and "Summary of the fruit-growing cadastral plot" (*Table 2*); local and county public institutions could then have a clear picture of the agricultural potential at parcel level per use category based on classes of suitability and favourability, providing very important information for the implementation of sustainable agricultural policies. Initially, this idea was required to be implemented according to the Methodological norms of the realisation and maintenance of the

viticultural cadastre, approved by Order no. 34/2000 of the Ministry of Agriculture and Food and published in the Official Gazette no. 212/2000, by establishing the basic and specialised data of vineyard units in Romania (Moca *et al.*, 2002). The document contains, for each of the individual properties, cadastral data and information collected in the measurements step (address of the real estate, property sketch, category of use, characteristics of property etc.), information from the real estate or land owners, from the Office for Cadastre and Land Registration (cadastral data of identification etc.) and other specialised services.

DISCUSSION

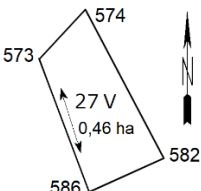
Until the launch of the National Cadastre and Land Book Program (PNCCF) in 2015, the difficulty of completing the cadastral documentation in order to register the legal situation of the property in the land register depended on the option of the owner, this being mandatory only in the case of a real estate transaction. Correlating Romanian legislation with that of the European Union is required in order to avoid the chaotic and unsustainable development of vineyard/fruit-growing plantations established by owners from their own funds. In the case of the cadastral parcel sheets given as an example, it is confirmed that the chosen varieties fall into the best classes of suitability and favourability according to European Union legislation.

When establishing vineyard/fruit-growing plantations with European funds, through the projects submitted to APIA, the owners of agricultural land

prove that the locations chosen are favourable for such plantations, but, because, in the case of those who establish plantations from their own

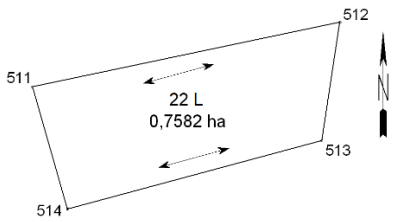
funds, they are not conditioned in any way by Romanian legislation, we consider it necessary to align the legislation in Romania with that of the EU.

Table 1 – Summary of the vineyard cadastral plot

County: IASI		Nomenclature: L-35-32-A-c-3-II-4-a		
Administrative unit: IASI		No. cadastral sector: 13		
Code SIRUTA: 95060		No. cadastral plot: 27 V		
Code inside / outside city: 1		No. cadastral register: 145973		
Property outline		Coordinates and surface inventory		
		Coordinates in Stereo-70 Projection System		
		No. point	X (m)	Y (m)
		573	636142.168	692766.298
		574	636173.939	692795.935
		582	636078.694	692846.322
		586	636057.063	692798.342
		SURFACE (mp)		4600
A. Fruit-growing land database				
Use category	Use subcategory	Destination group code	Quality class	Zone inside territory
Vineyard (V)	Classical vineyard (V)	Agriculture destination fields (TDA)	84 points	Copou – Iasi, M. Sadoveanu neighbourhood
B. Landowner database				
Landowner's name		➤ U.L.S. Iasi / D.R. / "Vasile Adamachi" Farm		
Landowner's residence / headquarters		➤ No. 9 M. Sadoveanu alley, Iasi		
Landowners group code		➤ DS – state public domain		
Ownership of the field		➤ Exclusive		
C. Real estate cadastral records speciality database				
Type of soil		➤ Cambic chernozem		
Suitability class		➤ Land with few restrictions		
Favourability class		➤ 81 – 100 points of cadastral creditworthiness		
Average slope of the plot		➤ 14 % (slightly inclined)		
Average altitude of the plot		➤ 160.3 m – Black Sea reference system		
Slope exhibition		➤ Semi-sunny (south-east)		
Anti-erosion arrangements		➤ Parallel rows of fruit trees in the general direction of level curves		
Type of culture		➤ Pure culture		
Type of culture system		➤ Intensive system		
Species name and surface		➤ Brack Fetească = 4600 mp		
Variety and surface / rootstock		➤ Brack Fetească		
Planting distances		➤ 2.2 m x 1.2 m		
Current degree of occupation		➤ 1698 hubs (97 %)		
Current age of the plantation		➤ 6 years		
Current stage of the plantation		➤ Very good		

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Table 2 – Summary of the fruit-growing cadastral plot

County: IASI	Nomenclature: L-35-32-A-c-3-II-4-a			
Administrative unit: IASI	No. cadastral sector: 13			
Code SIRUTA: 95060	No. cadastral plot: 22 L			
Code inside / outside city: 1	No. cadastral register: 145973			
Property outline	Coordinates and surface inventory			
	No. point	Coordinates in Stereo-70 Projection System		
		X (m)	Y (m)	
	511	636046.142	692929.766	
	512	636076.457	693074.720	
	513	636020.926	693065.975	
	514	635988.921	692946.243	
	SURFACE (mp)		7582	
A. Fruit-growing land database				
Use category	Use subcategory	Destination group code	Quality class	Zone inside territory
Orchard (L)	Classical orchard (L)	Agriculture destination fields (TDA)	92 points	Copou – Iasi, M. Sadoveanu neighbourhood
B. Landowner database				
Landowner's name		➤ U.L.S. Iasi / D.R. / "Vasile Adamachi" Farm		
Landowner's residence / headquarters		➤ No. 9 M. Sadoveanu alley, Iasi		
Landowners group code		➤ DS – state public domain		
Ownership of the field		➤ Exclusive		
C. Real estate cadastral records speciality database				
Type of soil		➤ Cambic chernozem		
Suitability class		➤ Land with few restrictions		
Favourability class		➤ 81 – 100 points of cadastral creditworthiness		
Average slope of the plot		➤ 14 % (slightly inclined)		
Average altitude of the plot		➤ 142.1 m – Black Sea reference system		
Slope exhibition		➤ Sunny (south)		
Anti-erosion arrangements		➤ Parallel rows of fruit trees in the general direction of level curves		
Type of culture		➤ Pure culture		
Type of culture system		➤ Intensive system		
Species name and surface		➤ Sour cherry tree = 7582 mp		
Variety and surface / rootstock		➤ Crişana = 5213 mp x Mocăneşti = 2369 mp		
Planting distances		➤ 3.9 m x 3.8 m		
Current degree of occupation		➤ 486 fruit trees (96 %)		
Current age of the plantation		➤ 6 years		
Current stage of the plantation		➤ Very good		

When owners want to change the category of use of the cadastral plots in order to update the cadastral documentation of the land registers, the Office for Cadastre and Land Registration should ask them for similar

projects to those at APIA, so that owners establishing plantations with their own funds will also have to comply with the same European Union legislation. For example, requests to change the use category of cadastral plots where vineyard

plantations have been established on north-facing slopes should no longer be approved by the Office for Cadastre and Land Registration, because there are frequent gaps in such plantations due to the risk of frost in spring during the flowering period. Likewise, for the same reason, the General Directorate of Economic and Local Public Finances located in the UAT could refuse approval when a change in the category of use of the cadastral parcels is declared, in order to establish the new tax rates.

The Cadastre and Real Estate Advertising Law highlights the importance of establishing the technical and legal instruments that contribute to proving and defending the ownership rights over the real estate.

From the point of view of the database user, it is specified that any graphical and non-graphical information about a real estate should be obtainable by querying this database.

Digital cadastral plans, on the other hand, are best suited to support the formation of thematic plans and collective files that contain data of an economic or social nature related to industry and the phenomena of atmospheric pollution, taxation, the population etc.

For better management and valorisation of graphic and non-graphic data of agricultural land, institutions should develop "multipurpose" systems, both for revalorisation of vineyard/fruit-growing plantations and also to continue the specific tradition in the north-eastern region of Romania.

CONCLUSIONS

Through the implementation of the projects for the re-establishment and

maintenance of vineyard/fruit trees plantations at the "V. Adamachi" didactic farm, with varieties permitted by the European Union, for the North-Eastern area of Romania, better exploitation of the potential of the area was achieved also by the repositioning of the cadastral parcels according to the relief.

In particular, the integration of the projects to maintain good conditions, modernise or expand the vineyard/orchard plantations with native varieties in the systematic cadastre works is expected to rehabilitate and protect the vineyard/orchard areas, which are region-specific.

Accessing large databases, through local networks and/or the Internet, presents an advantage in capitalising on the geo-informational data made available to potential users, where and when they need them, without being limited by poor computer performance.

Only by managing a system that is based on up-to-date data can it become a viable and useful support for making decisions on the rational use of agricultural land through land organisation, thus preventing the chaotic expansion of habitable areas, identifying new land resources etc.

In recent years, the areas occupied by vineyard/fruit-growing in Romania have decreased significantly, being in a continuous process of degradation. This is due to the inadequate maintenance of plantations owned by private producers and commercial companies and the low replacement rate of aging plantations with young ones. In some situations, the clearing of plantations was due to the expansion of buildable area of the localities as a result of the application of Law no. 18/1991.

The provision of current technical, economic and legal data through information systems has been developed as a "multipurpose" type system at the administrative-territorial unit level. The sustainable development of the wine and fruit-growing sector in Romania should now, therefore, be based on projects whose information was extracted from such "multipurpose" systems.

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REFERENCES

- Anggraini, N.D.; Trisnawarman, D.; Wasio; Arisandi, D. Geographic information systems of fire vulnerability area in West Jakarta. *TICATE*. **2019**. <https://doi.org/10.1088/1757899X/508/1/012122>
- ANCPI. National Cadastre and Land Book Program (PNCCF) 2015-2023, developed by the Cadastre and Land Register National Agency. *Site ANCPI*. 2015. <http://geoportal.ancpi.ro/geoportal/imo/bile/Harta.html>
- Badea, A.C. *Spatial planning and GIS for sustainable development. Applications/ Summaries* (in Romanian). MatrixROM, Technical University of Construction Bucharest, Romania, 2018, 64-76.
- Busko, M.; Apollo, M. Public administration and landowners facing real estate cadastre modernization: a win-lose or win-win situation? *Resources*. **2023**, *12*, 73. <https://doi.org/10.3390/resources12060073>
- Burja, C.; Burja, V. Sustainable development of rural areas: A challenge for Romania. *Environmental Engineering and Mangement Journal*. **2014**, *13*, 1861-1871.
- Ciani, A.; Porcellati-Pazzaglia, L.; Acatrini, R.; Dobrica, S.S.; Farcas, E. Sustainable management and promotion of territory: a challenge for the rural areas in the world. *Scientific works, Agronomy series*. **2011**, *54*, 42-43. <https://repository.uaiasi.ro/xmlui/handle/20.500.12811/3420>
- David, L.; de Rességuier, L.; Petitjean, T.; Tissot, C.; Quénot, H.; Le Roux, R.; van Leeuwen, C. An innovative interactive mapping tool to present research results: example of a terroir study in the context of climate change. *IVES - International Viticulture and Enology Society*. **2023**. <https://doi.org/10.20870/IVES-TR.2023.7652>
- Dolejs, M; Forejt, M. Franziscan cadastre in landscape structure research: a systematic review. *Quaestiones Geographicae*. **2019**, *38*, 131-144. <https://doi.org/10.2478/quageo-2019-0013>
- Doner, F. Analysis of literature on 3D cadastre. *International Journal of Engineering and Geosciences*. **2021**, *6*, 90-97. <https://doi.org/10.26833/ijeg.703244>
- Dragomir, P.I.; Haret, C.; Moraru, N.; Neuner, I.; Săvulescu, C. *Topographic works in the cadastre. Guide* (in Romanian). MatrixROM, Technical

- University of Construction Bucharest, Romania, 2000, 117-236.
- Huțanu, C.** *Vineyard Cadastre Informational System*. Tehnopress, Iasi, Romania, 2014, 132-189.
- Huțanu, C.; Radu, O.; Pădure, D.** Updating the cadastral database with a view to the creation of vineyards and fruit trees. "Ion Ionescu de la Brad" Iasi, *Agronomics Series*. **2016**, 59, 289-294.
- Iordan, D.; Munteanu, B.; Eni, I.** Sporadic cadastre, systematic cadaster. *Scientific Papers. Series E*. **2013**, 7, 133-136.
- Irimia, L.; Patriche, C.V.** GIS application in viticulture: The spatial distribution analysis of slope inclination and slope exposure in Huși vine growing centre - Huși vineyard. *Agronomic research in Moldova*. **2011**, 1, 51-59.
- Irimia, L.; Patriche, C.V.; Quenol, H.** Mapping Viticultural Potential in Temperate Climate Areas. Case Study: Bucium Vineyard. *Journal of Applied Life Sciences and Environment*. **2012**, 2, 75-84.
- Mika, M.; Kotlarz, P.; Jurkiewicz, M.** Strategy for cadastre development in Poland in 1989-2019. *Survey Review*. **2020**, 52, 555-563.
<https://doi.org/10.1080/00396265.2019.1674472>
- Moca, V.; Popia, A.C.; Radu, O.; Fronea, L.; Filipov, F.** Realization of the technical and specialized record system of the viticultural cadastre (in Romanian). *Scientific works of the GeoCAD 2002 Symposium*, **2002**, 8-16
- Paasch, J.M.; Paulsson, J.** 3D property research from a legal perspective revisited. *Land*. **2021**, 10.
<https://doi.org/10.3390/land10050494>
- Popescu, A.** Pollination and its contribution to the fruit production value in Romania's orchards in the period 2011-2020. *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development*. **2021**, 21.
- Popescu, C.** General cadastre. Systematic registration of real estates. *Eurostampa*. 2015.
- Radu, O.** Realization of the systematic cadastrum in Romania. *Scientific works, Agronomy series*. **2022**, 65, 11-16.
- Rakusa, M.; Liseac, A.; Ceh, M.** Integration of land cadastre with spatial plan data. *Geodetski vestnik*. **2021**, 65, 385-399.
<https://doi.org/10.15292/geodetski-vestnik.2021.03.385-399>
- Roic, M.; Krizanovic, J.; Pivac, D.** An approach to resolve inconsistencies of data in the cadastre. *Land*. **2021**, 10.
<https://doi.org/10.3390/land10010070>
- Tissot, C.; Rouan, M.; Petitjean, T.; David, L.; Le Roux, R.; Quénol, H.; Neethling, E.; de Rességuier, L.; van Leeuwen, C.; Irimia, L.; Patriche, C.V.** Simulating the impact of climate change on viticultural systems in various european vineyards. In *XIIIth International Terroir Congress* (Adelaide, Australia). 2020, Available at: <https://hal.archives-ouvertes.fr/hal-03094081>
- Zărnescu, A.; Ungurelu, R.; Secere, M.; Coman, C.M.; Varzaru, G.** Putting Internet-of-Things at the service of sustainable agriculture. Case study: Sysagria. *Scientific works, Agronomy series*. **2019**, 62, 9-14.

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