UPDATING OF CADASTRAL DATABASE WITH A VIEW TO THE CREATION OF VINEYARDS AND FRUIT TREES

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Abstract

From the necessity of re-capitalization of the potential of 32.7923 ha of study area in the Didactic Resort V. Adamachi, Farm of University of Agricultural Sciences and Veterinary Medicine of Iasi, were made topographical measurements to update the cadastral plan and cadastral database, in order to draw up projects for reestablishment of vineyards and fruit trees plantations. For a more effective management and exploitation of the potential of a vineyard and fruit trees area, it requires the establishment of Cadastral Informational System by domains of activities, because in the absence of them, the works of territory systematization can have a negative impact on the soil and the environment. In support of the reform of the fruit and wine sector from Romania, which according to the socio-economic analysis has shown that it is in a steady decline, the European Union comes through funding projects for the rehabilitation of this sector, especially wanting to protect the traditional vineyards and fruit trees areas. Cadastral databases obtained at the level of territorial-administrative units, based on the actual data in the field, can lead to achieve certain clear and accurate records, useful for both institutions managing such systems, as well as for users of these plantations. The most obvious changes have occurred in the time of re-establishing of 12.5 ha of vineyards and 3 ha of fruit tree plantations, with European funds through the Agency for Payments and Intervention in Agriculture. At the same time, these projects are made from the perspective of sustainable development of the Adamachi Farm, and the continuation of specific tradition of the area of East and North-East of Romania.

Key words: cadastral plans, cadastral plots, agricultural and non-agricultural land use categories

For obtaining a modern system of Cadastre and Real Estate Advertising and a Cadastral Informational System by spheres of activity is necessary to perform new geodetic and topographical measurements, on the basis of which to perform exact cadastral territory mapping, cadastral register and ownership, in a unique land book, throughout the national territory.

Based on the primary data of the Cadastre, can be carried out **Cadastral Informational Systems by fields of activity**, such as: **Agricultural Informational System**, which is composed of five subsystems (*Agricultural Informational System, Pasture Informational System, Hay Fields Informational System, Vineyard Informational System and Orchards Informational System*); **Forestry Informational System**; **Water Informational System of** and **Real Estate Informational System** (**Urban**), each containing technical data and specific information, in accordance with the technical standards of achievement and maintenance (Huţanu C., 2014).

The development of cadastral data bases of Cadastral Informational Systems, on GIS programs platform, creates advantages in the management, exploitation and updating of records based on information that describe the cadastral situation on the field at any time (Bădescu G., 2007).

MATERIAL AND METHOD

The case study is the area of 32.7923 ha in the Didactic Resort V. Adamachi Farm of University of Agricultural Sciences and Veterinary Medicine of Iasi.

Within that area, it was pursued the dynamic of the changes in the structure of the cadastral parcels, such as surface and category of use, both during the period when it was in the outland of the municipality of Iasi, and after inclusion in 2007, according to the General Urban Plan of the City Hall of the municipality of Iasi, in the built-up area of the Municipality area.

To do this, it has accessed the database from the Office of Cadastre and Land Registration of Iasi, and in 2014, in order to reorganize of the land, were performed topographic measurements with total station TC 705, Leica Geosystems, with standard error of a direction of 15^{cc} and measurement accuracy of distances of 2 mm ± 2 ppm.

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RESULTS AND DISCUSSIONS

In order to obtain the cadastral plan of the studied area, from the period when he was in the outland of the Municipality of Iasi, have been accessed the cadastral data of Office of Cadastre and Land Registration of Iasi, from the year 2006 (*figure 1*).

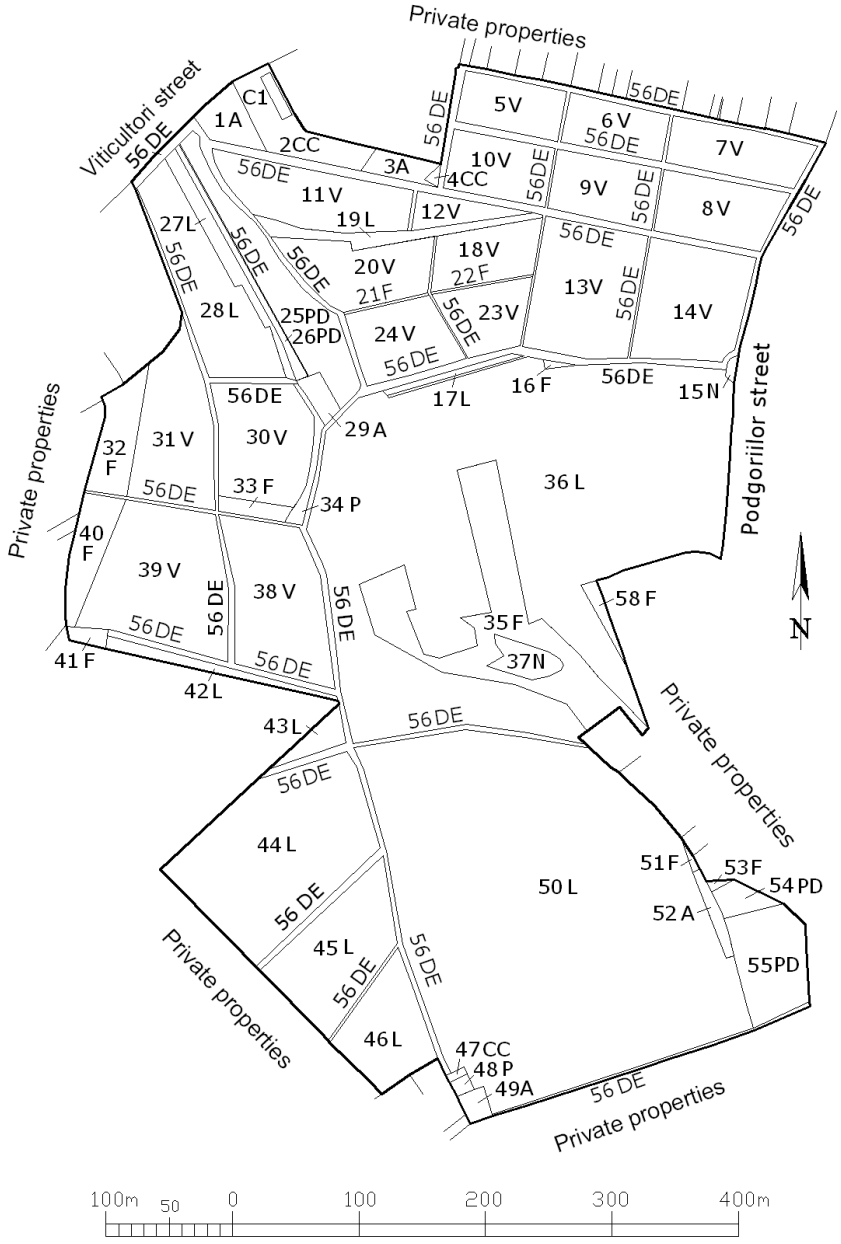

Figure 1 **The cadastral plan of the study area, regarding the use of cadastral parcels, by categories of use, in the year 2006**

In order to obtain, in the year 2008, for the studied real estate, the cadastral number and its provisional entry in the Cadastral Register of the Municipality Iasi, with indefinite character, was drawn up documentation of the Cadastral Register. O Once obtained, from the Office of Cadastre and Land Registration of Iasi, technical documentation for Cadastral Register, the Office of Cadastre and Land Registration recognizes the application concerning the tabulation of the property right on the basis of the following documents attached: normative act issued by the Government of Romania, the protocol of rendition issued by the Ministry of Agriculture and Rural Development and inventory of handed areas from the State Domains Agency towards the Didactic Resort V. Adamachi, Farm of University of Agricultural Sciences and Veterinary Medicine of Iasi.

According to the Annex of Extract of the Cadastral Register for Information, for the immobile in the area of 327923 square meters (*figure 2*), obtained from topographical measurements, are presented with the following information: tabulated on the basis of the General Urban Plan, in the inside of Municipality of Iasi; cadastral number signed up in the Cadastral

Register of the Administrative Territorial Unit of Iasi; real estate area from measurements in square meters, determined in the 1970 Stereo projection; sketch of the immobile with the numbering of the glimpse points of contour; data field (category of use, surface from acts and from measurements, no. sector, no. parcel); data regarding construction (construction destination, area from acts and from measurements, the legal situation); horizontal distances between glimpse points on the real estate contour, in decimeters.

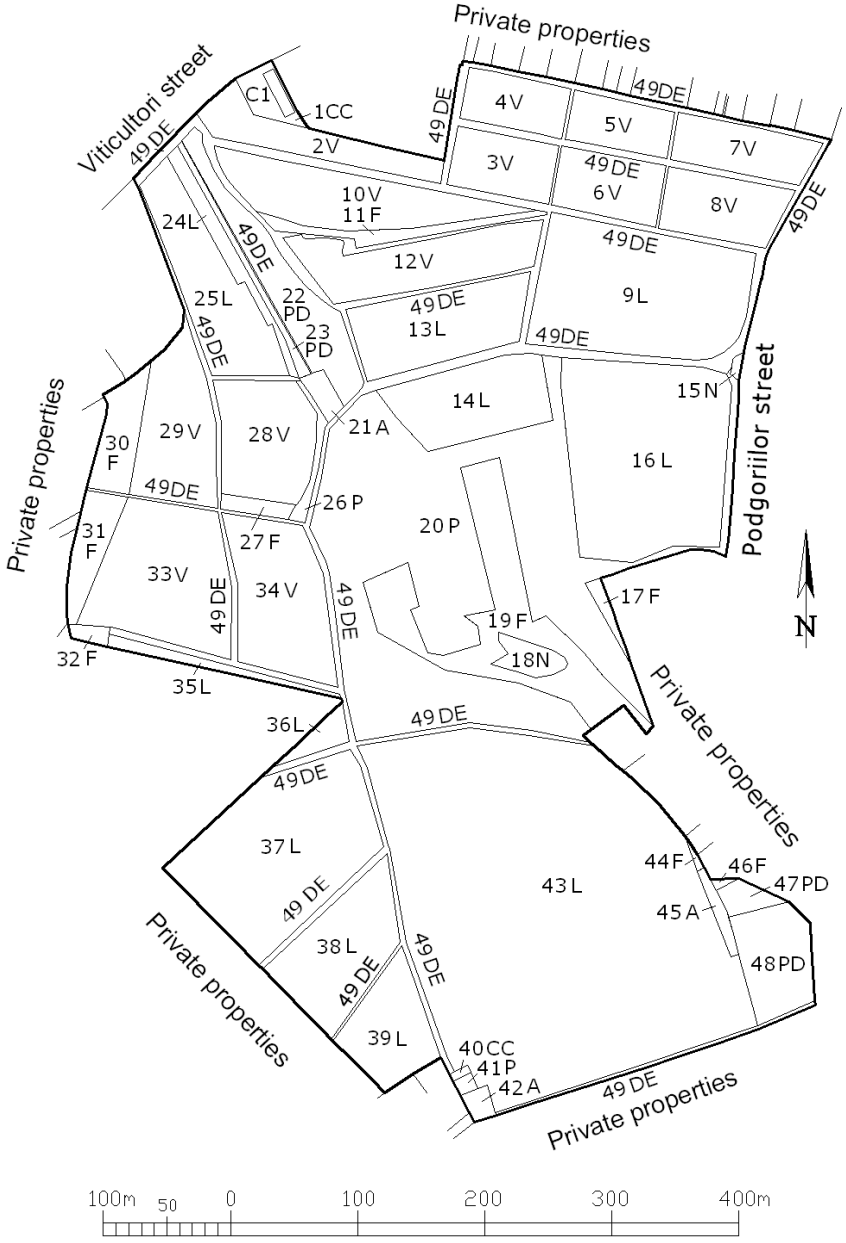

Figure 2 **The cadastral plan of the study area, regarding the use of cadastral parcels, by categories of use, in the year 2008**

For the purpose of replanting an area of 12.5 ha of vines, respectively of 3 ha with fruit trees, there were realized projects for the reestablishment of the vineyards/fruit from European funds, through the Agency for Payments and Intervention in Agriculture. The reason for the abolition of the former vineyards/fruit trees plantations was due to the fact that the existing plantations had a term of operation of more than 30 years.

In the preparation of replanting documentation for the proposed site with vineyards/fruit trees plantations were kept in sight the following issues: getting a vineyards/fruit trees plantations with productive varieties, of superior quality, resistant to diseases and frost, required both in the internal market and for export; the main pedoclimatic terms, because it provides a good degree of favorability for the species that will be planted; judicious use of the land fund law, at a profitable and efficient potential.

Organizing the emplacement proposed for the re-establishing of vineyards/fruit trees

plantations, presented in the cadastral plan (*figure 3*) is correlated with all the elements to combat soil erosion, and ensuring conditions for mechanized works (Savu P., 2002).

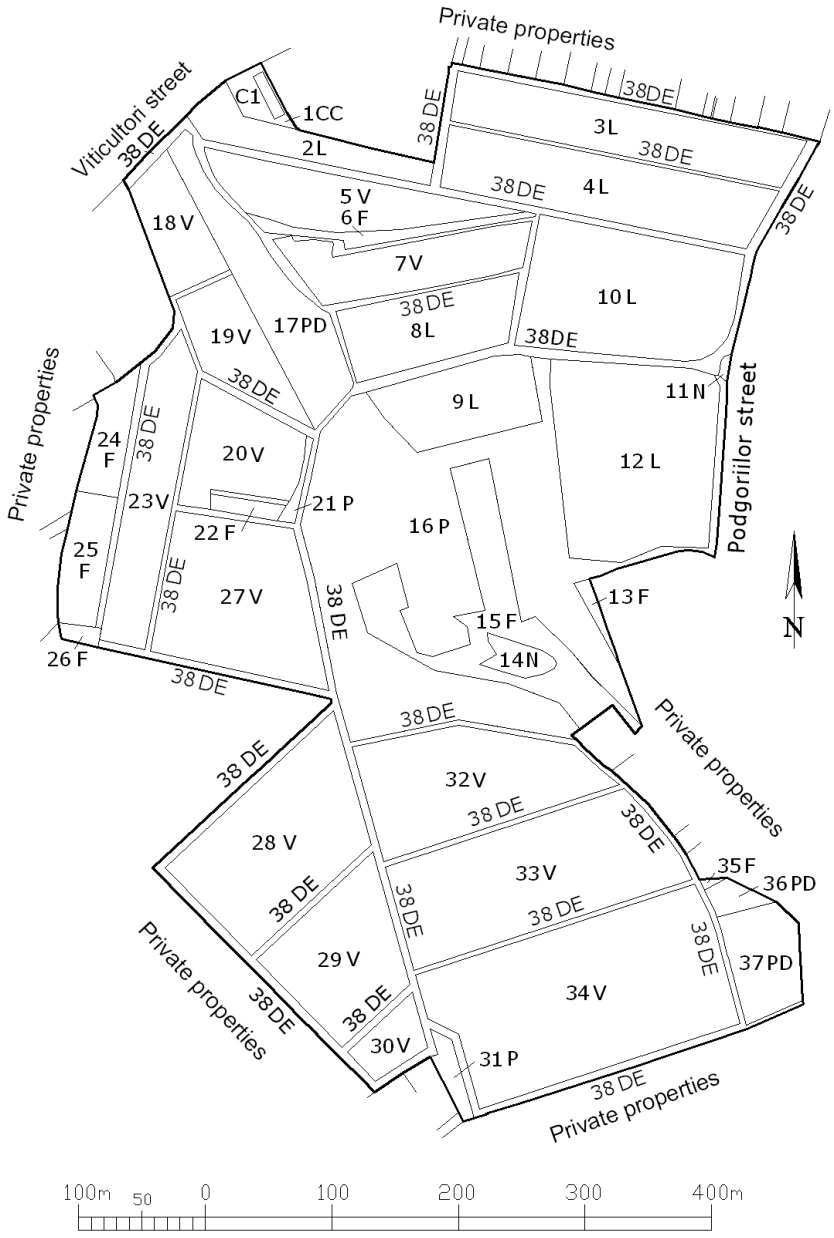

Figure 3 **The cadastral plan of the study area, regarding the use of cadastral parcels, by categories of use, in the year 2014**

Due to the layout of the Didactic Resort V. Adamachi, Farm of University of Agricultural Sciences and Veterinary Medicine of Iasi, in an amphitheatrically form, as antierosion measure, for the plots cultivated with vines and fruit trees, located on moderately inclined ground, was adopted the planting of rows parallel to the general direction of level curves, for the purposes of realising the maintenance works in the same direction.

In the designing of the operating roads have been taken into account the existing slope limits, according to the antierosional arrangements.

Thus, secondary roads were designed on the long side of the agricultural parcels, and the main ones (in terms of technological importance), upstream towards downstream, with slopes of less than 10%, the trying to obtain mechanized worked agricultural plots as close as possible to the rectangular geometric form. At the ends of agricultural parcels were provided with roads and turning area.

The overview picture of cadastral parcels distribution by category of use of land within the studied unit was achieved by centralizing data in cadastral *table 1*.

According to the cadastral situation of the year 2006 the total of agricultural land, consisting of 46 plots, is in the area of 29.1415 ha (88.87%), while total non-agricultural land, consisting of 10

plots, is in the area of 3.6508 ha (11.13%). The plots occupied with plantations of vine are on an average area of 0.5 ha, and those occupied with plantations of fruit trees on average area of 1.6 ha.

Originally, when was drew up the systematization plan for setting up the studied unit, access paths and roads of exploitation had widths between 2.5 m and 4 m.

Table 1

1989's cadastral situation of the parcels from the studied categories of use of land

No.	Use category of the land	Plots number	Plots area	
			ha	%
1	Arable (A)	5	0.4401	1.34
2	Pasture (P)	2	0.0900	0.27
3	Hay (F)	10	1.8950	5.78
4	Noble vine (VN)	18	9.6529	29.44
5	Orchard (L)	11	17.0635	52.03
6	Forest (PD)	4	1.2521	3.82
7	Roads-streets (DS)	1	1.9052	5.81
8	Yards and constructions (CC)	3	0.3600	1.10
9	Unproductive lands (N)	2	0.1335	0.41
THE STUDIED AREA TOTAL		**56**	**32.7923**	**100.00**

By analyzing the cadastral situation from 2008, shown in *table 2*, the total agricultural land, consisting of 40 plots, is in the area of 29.1992 ha (89.04%), while total non-agricultural land, consisting of 9 plots, in the area of 3.5931 ha (10.96%).

The parcels filled with vine plantations are on an average area of 0.6 hectares, and those occupied with plantations of fruit trees on average area 1.3 ha.

Compared to the year 2006's situation of cadastral register, the total vines and fruit trees area suffered substantial reductions of 6.20% (2.0323 ha), respectively 5.77% (1.8924 ha), in particular, at the expense of total surface occupied with pastures, who grew up with 12.39% (4.0627 ha).

Table 2

2008's cadastral situation of the parcels from the studied categories of use of land

Nr. crt.	Categoria de folosinţă a terenului	Nr. parcele	Suprafaţa parcelelor	
			ha	%
1	Arable (A)	3	0.1801	0,55
2	Pasture (P)	3	4.1527	12,66
3	Hay (F)	9	2.0747	6,33
4	Noble vine (VN)	13	7.6206	23,24
5	Orchard (L)	12	15.1711	46.26
6	Forest (PD)	4	1.2494	3.81
7	Roads-streets (DS)	1	2.0533	6.26
8	Yards and constructions (CC)	2	0.1569	0.48
9	Unproductive lands (N)	2	0.1335	0.41
THE STUDIED AREA TOTAL		**49**	**32.7923**	**100.00**

By analyzing cadastral situation from year 2014, shown in *table 3*, the total agricultural land, consisting of 31 plots, is in the area of 28.1161 ha (85.74%), while total non-agricultural land, consisting of 7 plots in the area of 4.6762 ha (14.26%).

In comparison with the situation of register in 2008, the total vine area grew with 19.45% (6.3787 ha), in particular, to the detriment of the total fruit trees surface, which decreased with 22.68% (7.4363 ha).

Table 3

2014's cadastral situation of the parcels from the studied categories of use of land

Nr. crt.	Categoria de folosinţă a terenului	Nr. parcele	Suprafaţa parcelelor	
			ha	%
1	Arable (A)	-	-	-
2	Pasture (P)	3	4.1943	12.79
3	Hay (F)	8	2.1877	6.67
4	Noble vine (VN)	13	13.9993	42.69
5	Orchard (L)	7	7.7348	23.59
6	Forest (PD)	3	1.4214	4.33
7	Roads-streets (DS)	1	2.9744	9.07
8	Yards and constructions (CC)	1	0.1469	0.45
9	Unproductive lands (N)	2	0.1335	0.41
THE STUDIED AREA TOTAL		**38**	**32.7923**	**100.00**

As a result of these changes, currently, vine and fruit growing plots are larger, both with an average area of 1.1 ha.

Compared to the year 2006 situation of cadastral register, total area of occupancy of exploitation roads increased with 3.26% (1.0692 ha), in particular, due to measures of insuring roadways with larger bandwidths.

In order to get a more suggestive overview on the dynamics of the areas of the plots, by category of use of the land of the area studied, the cadastral data presented in the previous tables are presented graphically in *figure 4*.

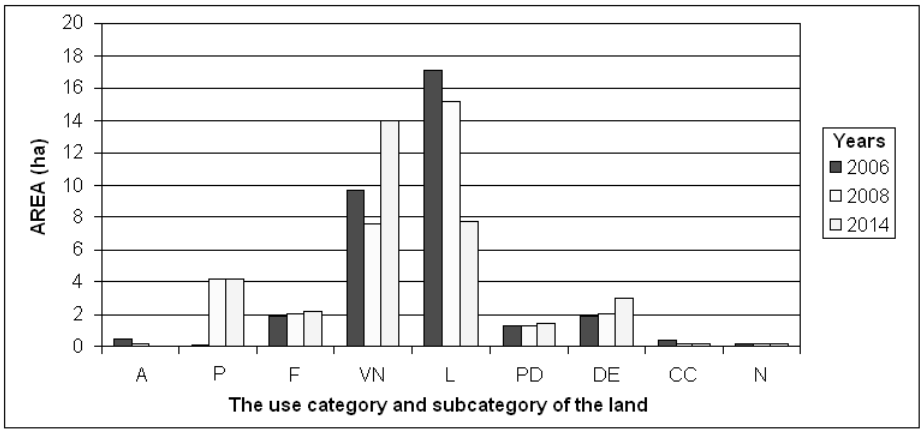

Figure 4 **The dynamic of cadastral parcels areas by category of use of the land (2006 – 2014)**

In the perspective of enlargement, modernization and maintenance in good condition of vineyards and fruit trees plantations, especially those with a long tradition, the Managing Authority for the National Program for Rural Development published in 2013 a report regarding „*Social economic analysis in rural development perspective 2014-2020*". This report argues the necessity of supporting the agricultural sector from Romania, found into a steady decline in the last 20 years, producing negative consequences not only on the economic development of the rural environment, but also on the quality of life of communities in the area.

As a response to this approach, re-establishing of 12.5 ha of vineyards, 3 ha of fruit trees plantations in the Didactic Resort V. Adamachi, Farm of University of Agricultural Sciences and Veterinary Medicine of Iasi, it is done in order to exploit the potential of this area, as well in order to continue the tradition of the Eastern and North-Eastern area of Romania.

CONCLUSIONS

The update of cadastral database, through topographic measurements, presents as advantage in the projects of re-establishment of vineyards/fruit trees plantations, a more efficient reconfiguration of the agricultural parcels proposed for re-establishing, depending on the conditions of relief, realizing a more durable re-evaluation of the potential of the area of study.

In order to make more efficient the mechanized technological works, specific to the vineyards, were obtained by reconfiguring larger surfaces with 45.5%, with an average area of 1.1 ha.

Increased interest from the part of farmers and institutions in the field of agriculture from Romania will have as a consequence, by drawing up viable projects, a sustainable development of agriculture and the continuation of the specific tradition of the Eastern and North-Eastern area of Romania.

ACKNOWLEGMENTS

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BIBLIOGRAPHY

Bădescu G., 2007 – *Aspects regarding automation of topographic cadastral works,* RevCAD – Journal of Geodesy and Cadastre, 7:215-230

Huţanu Cr, 2014 – *Vineyard Cadastre Informational System*, Tehnopress Publishing, Iasi

Savu P., Bucur D., 2002 - *The Organization and Fitting of Agricultural Land with Works of Land Improvement*, "Ion Ionescu de la Brad" Publishing, Iasi

******* *Socio-economic analysis in the perspective of rural development 2014-2020,* developed by the Managing Authority for the National Program for Rural Development, 2013

******* *Cadastre 2014 A report of the activities of the FIG Commission 7 Annual Meeting working group on modern cadastres,* Austria, 2011

******* *Technical normative for general cadastre introduction,* approved by The Order No.534/2001 of Ministry of Public Administration, M. Of. No. 744/200