

THE OBJECT OF AGRICULTURAL CADASTRE IN THE REPUBLIC OF MOLDOVA

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Abstract: *At present, it could be noticed a high level of agricultural land use. Therefore the need of creating a modern agricultural information system is obvious.*

In their turn, both agriculture, where agricultural land represents the main element, and the agricultural land, which is under intensive influence of agriculture, include a variety of forms, contents, qualitative and quantitative aspects, etc.

With the purpose of determining the object of agricultural cadastre, the author of this article proposes to use the following definition: „Agricultural Cadastre is the specialized cadastre in the field of agriculture and as such it must provide systematic record and inventory of the real estate property considering its various aspects - surface, category and subcategory of land use, land owner etc. - as well as other information in order to meet the needs related to agriculture”.

Keywords: *Agricultural cadastre, Agricultural information system, Category and subcategory of land use, Landowner.*

1. Introduction

Having an economic content, the agricultural cadastre existing in the Republic of Moldova depends on the economic and social problems of society.

The development of market economy creates very important problems, including for the agricultural cadastre. However, the main purpose of agricultural cadastre consists in accumulating and providing information about the sectors of land, constructions, facilities located on these lands, about the size and quality of real estate as well as about their economic, ecological and social value and their rights.

The current period has its specific features because it is a period of reform and transition of the national economy the essence of which consists in the implementation of market economic relations, and namely for the agricultural cadastre - in creating the agricultural information system. At this stage, the agricultural cadastre is facing a very important challenge: the creation of favourable juridical and economic conditions for the development of real property and creation of the agricultural information system at European level including its further implementation in country's economy.

An important role of the agricultural cadastre consists in the rational use of the most important wealth of our country - its *land resources*. For the economy of the Republic of Moldova, a country with scarce mineral resources and specific spatial and geographical location, the rational use of land is of the greatest importance.

In Moldova, this aspect that is addressed at national level by all cadastral activities will determine the purpose, content and object of agricultural cadastre for a long period of time.

Correct formulation of the agricultural cadastre content depends largely on how accurately the object of agricultural cadastre is formulated in the Republic of Moldova.

The object of agricultural cadastre, during its development, suffered very important changes. Analyzing multiple sources of information on the content of the cadastral activities carried out in different countries and in different periods of time, it could be concluded that the purpose of the agricultural cadastre at the initial stage was the correct measurement of land sectors while specifying the landowner [2].

According to the above mentioned facts we can determine that the object of agricultural cadastre, at this stage, is the land (parcel) and its purpose is formulated by the economic requirements, more specifically, by the requirements of the fiscal policy. The need to keep a correct fiscal policy helped to formulate the purpose of agricultural cadastre activity both as activity and science as a whole.

At present, the object of agricultural cadastre is the land (parcel) with or without constructions or engineering facilities determined by their location in space and the land owner with the property rights related to this land.

Land sector as object of agricultural cadastre has an important role. The constructions, facilities, perennial plantations and even landowners are components of the agricultural cadastre object only if the sector of land is present. The object of agricultural cadastre doesn't exist without the land sector. Also, the land sector can't be the object of agricultural cadastre without the existence of an owner.

It was proved, in terms of agricultural cadastre object, that there are no land sectors that would not belong to someone in the Republic of Moldova. This is an axiom of the agricultural cadastre, regardless of the fact that the law recognizes the concept of “property without ownership”. Even in cases where it is not possible to determine the owner of the property then provisionally it is recognized as public property until the final determination of the property rights.

This fact is of great importance for the correct formulation of agricultural cadastre object.

In its turn, each of the two parts of the agricultural cadastre object (land sector and landowner) includes several features and namely:

- the land sector (property) - could be characterized by its quantity, quality, destination, use, placement etc.;
- the landowner - could be characterized by his/her identification documents under which he/she became the owner of the property [2].

As the main object of agricultural cadastre, the land sectors and the whole land fund are represented in the form of land use categories.

According to the land legislation in force, the land fund of the Republic of Moldova, i.e. the agricultural land, by its area, represents the largest category of destination.

Currently, total area of agricultural land constitutes 1,978,900 ha, out of which 85% is private property. Arable land constitutes 84% of the total area of agricultural land. This situation remains practically unchanged for several consecutive years with small deviations.

Out of the total area of the above mentioned agricultural land, 44 % belong to the degraded agricultural land under the influence of erosion at different stages.

2. Materials and methods

The category of agricultural land is determined based on its most essential features: the principle of suitability, feasibility and socio-economic need, which as a whole is or would ensure the best use of land.

Further, the category of agricultural land is divided into the following categories of destination (Fig. 1): *subcategories of agricultural land; categories of land use; subcategories of land use (mode of use); agricultural parcels; species, varieties.*

According to this consecutive order and to the size, the „category of agricultural land” will occupy the highest position in the hierarchy of agricultural cadastre.

The subcategories of agricultural land represent the first detail of the object of agricultural cadastre.

For a deeper breakdown of the agricultural cadastre object and thereby in order to achieve a higher level of agricultural land use it is necessary to divide the agricultural land into productive and non-productive land (Fig. 1):

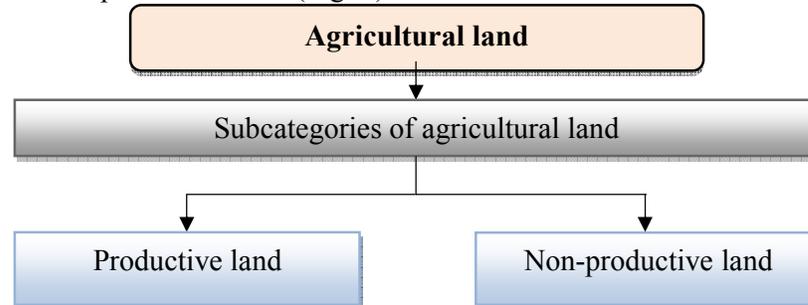


Figure 1. Structure of the agricultural land use category

Source: elaborated by the author based on the accomplished studies

The subcategory of productive land includes the land that is directly involved in the cultivation of various agricultural crops.

1,929,100 hectares out of the total 1,978,900 hectares of agricultural land participate directly in plant cultivation. These lands include: arable land, perennial plantations, pastures and hayfields that make up the land fund of productive land.

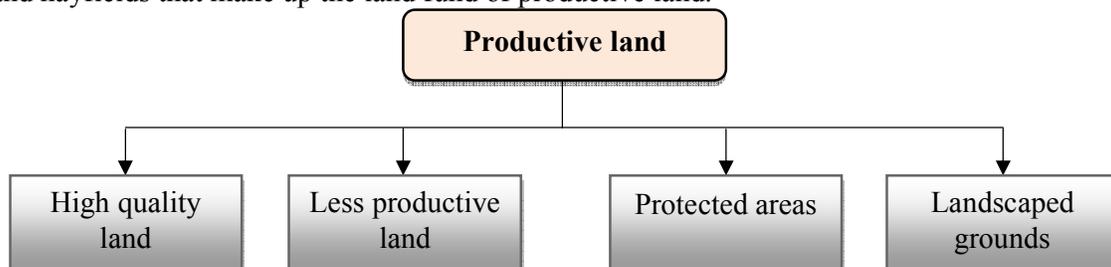


Figure 2. The structure of productive land

Source: elaborated by the author based of the accomplished studies

Also, the productive land, depending on the economic, environmental and social requirements, could be divided into the following subcategories (Fig. 2):

- high quality productive land;
- less productive land;
- protected areas;
- landscaped productive grounds (land).

The formation of the subcategory of high quality land was influenced by the economic, environmental and social requirements as a whole.

The economic aspect of high quality land is well pronounced. The differentiation of land according to its natural potential is used for centuries by the fiscal policy in the „differentiation of ground rent”. Usually the land tax is higher for the high quality land.

In its turn, it is of crucial importance to keep the potential of high quality land in the land use process. This requirement also has a social aspect - preserving soil potential (fertility) for the benefit of future generations.

All these facts have been reflected in the legal framework of the Republic of Moldova.

Thus, the article 83 of the Land Code approved by the Law no. 828 of 25.12.1991 stipulates: „*In order to protect high quality agricultural land it is prohibited to exclude them from the agricultural cycle, to use them for purposes other than farming, to carry on such land technological or other activities that lead to soil degradation, except the cases when these lands are assigned for the construction of linear sites (roads, telecommunication lines, electric power transmission lines or pipelines), sites for mineral and oil/gas exploitation and production facilities required for their exploitation.*

The exclusion of high quality agricultural land from the agricultural cycle for state and public needs is made only in exceptional cases, by Government decision” [1].

The protection of high quality land is provided by the legislation of all countries. This fact proves the objective need to identify this subcategory of land by separate units. Otherwise it is impossible to protect them.

Thus, high quality lands are the horizontal and quasi-horizontal land plateaus, large plains situated on the slopes up to 3 degrees, land with assessed natural fertility over 60 degrees as well as the irrigated land [1].

The construction of objects destined to the protection of agricultural land (soil layer), irrigated land, drained land, forest land etc., is not considered as changing the land use category.

It is obvious that if we have identified the high quality land within the productive land fund then the rest of the land will be of medium or low quality (less productive).

From the point of view of the economic, environmental and social interests, it is not less important to study another subcategory, the one of less productive land.

Less productive lands are the lands located on compact surfaces, not less than 0,25 ha, on slopes greater than 5 degrees and having the fertility degree of no higher than 30 degrees [2].

Regardless of the fact that these lands are classified as less productive land, the attention paid to them is major. The purpose of agricultural cadastre regarding such lands is to select a rational way (in terms of economic, environmental, social, etc. aspect) for their prospective use. In most cases, any of the selected ways is accompanied by major budgetary expenses. Therefore the chosen decision must be substantiated.

The decision to include the agricultural land in the subcategory of „less productive” land is adopted by a special committee of the local council based on pedological studies performed by the highly qualified specialized public institutions.

In most cases, lower quality lands are the subject to agricultural land consolidation projects.

The use of less productive land under the Program of agricultural land consolidation does not deprive that person of the right to the land, moreover the owner benefits from the results of the Programme.

Less productive lands could be often found under the following names:

– *degraded land* (land undergoing excessive degradation, without vegetation) includes:

– *Boulders, cobbles, pebbles* (land covered by massive boulders, cobbles or pebbles without vegetation);

– *Gullies, ravines, valleys* (active landslides which are not productive unless they are not afforested);

– *Land with salty crust surface* (highly saline soils which form a whitish salty crust on the surface);

– *Marshes and bogs* (types of wetland and land with frequent alternations of excessive water and drought, without vegetation. The land with reed marshes is recorded in the category of waters and reed;

– *Borrow pits and quarries* (lands that became non-productive by the removal of topsoil and rocks for various economic needs);

– *Dump (landfill) sites* (sites for the disposal of waste materials resulting from industrial and mining activities).

The policy regarding rational use of agricultural land includes a special chapter devoted exclusively to less productive lands.

Agricultural lands regardless of their productivity or quality level and depending on the circumstances may also become the object of protected areas.

Protected areas - represent an area within which are located different objects that require specific regulation in order to safeguard their quality, to preserve their equilibrium through interventions and conservation as well as to ensure harmonious relations with the environment.

The legal framework regulating land relations within the protected areas includes: *the Law on the fund of natural areas protected by the State (no. 1538 of 25.02.1998)*; *the Law on the principles of Urban and Regional Planning (no. 835 of 17.05.1996)*; *the Law on the protective zones and forest belts of river waters and water basins (no. 440 of 27.04.1995)*; *the Water Code Law of the Republic of Moldova (no. 1532 of 22.06.1993)* [2].

The measures regarding agri-environment protection as well as the size of protected areas are established depending on the category of object, the requirements for this object and the way this object influences the environment. The dimensions of protected areas are established according to the legislation in force.

All agricultural lands threatened by the activity of a property could be considered as object of protected areas. For example: different factories (cement, sugar), facilities designed for mineral extraction, aquatic objects that are threatened to be polluted in the process of farming and other facilities designed for entertainment.

The legal regime of agricultural land included in the protected area, the limitation of rights as well as the establishment of certain mandatory conditions are set by the legislation in force.

Land marking of the agricultural land included in sanitary protected areas is performed using conventional signs according to a special regulation approved by the specialized authority.

The restrictions regarding the use of agricultural land included in sanitary protected areas are entered in the Real Estate Register in accordance with the legislation.

The land included in the protected area remains the property (under the management) of the landowner.

The exclusion of affected land of protected areas from the category of agricultural land and their inclusion in the category of public property shall be made in accordance with the land legislation in force.

Landscaped grounds - landscaped grounds are considered the lands with irrigation systems, drainage systems and other constructions and facilities that have direct influence on the regime of plant growth, soil quality and production volume.

Irrigated land - is the land useful for agriculture and irrigation, equipped with temporary or permanent irrigation networks, provided with sufficient water from the irrigation source.

Land organization and land use is achieved respecting the optimal operating conditions of the irrigation systems, drainage systems, prevention of erosion phenomena etc.

All landowners having land within the perimeter of the irrigation system complies with all common operating conditions established on the basis of a mutual agreement confirmed by the mayor.

The right to use water resources is issued to the holders of agricultural land under the procedure established by law.

Drained lands - are the lands equipped with drainage systems providing a favourable air and water regime suitable for growing plants.

The drainage of land is performed for the purpose of being used in agriculture, halting the destructive processes (landslides etc.), protecting and using the constructions and facilities.

The drainage system is designed taking into consideration the peculiarities of soils and their hydric regime, without taking into account the boundaries of estates.

The construction of drainage systems is carried out based on a mutual agreement between landowners which is confirmed by the mayor.

The damage caused to the land owners as a result of constructing the drainage systems is compensated by the physical or juridical persons for whom these works were carried at a negotiated price or in the amount set by the court based on the report of independent experts.

Also, *the category of landscaped grounds* could include other constructions and facilities located on the agricultural lands which are designed to serve the agricultural production process.

Non-productive agricultural land - with an area of 48.800 ha is not directly involved in plant cultivation. These lands include roads, protective forest belts, constructions etc.

The agricultural land could be also non-productive because of other reasons:

- anthropic factor;
- natural factor [2].

The agricultural sector, by its content, includes a whole infrastructure, a complex of constructions, installations and facilities. This set of objects includes:

- *land occupied by agricultural or animal breeding constructions and facilities;*
- *fish breeding and land improvement facilities;*
- *platforms;*
- *storage facilities;*
- *warehouses that serve the process of agricultural land exploitation;*
- *protective forest belts to control erosion;*
- *technological and agricultural service roads.*

Technological roads are usually crossing the vineyards and orchards serving for a single landowner.

Agricultural service roads serve usually several landowners and establish connections between the massifs of agricultural land and public roads.

Both the technological and agricultural service roads are privately owned by the agricultural land owners.

Agricultural service roads are mostly common property. The share in the common property area is proportional to the length of the road afferent to the served area.

It is prohibited to use the technological and agricultural service roads for purposes other than as intended.

However, within the massifs of productive agricultural land, because of natural reasons, there are lands unused into production.

CATEGORIES OF LAND USE - the need to identify the categories of land use is one of many other incentives to develop the structure of agricultural cadastre up to the level of parcels.

The structure of uses within the category of land use is reflected in Fig. 3. The categories of agricultural land use include the following types of land: arable land, orchards, vineyards, pastures, hayfields, forest plantations, waters, roads, agricultural constructions and other land (which can't be farmed: gullies, landslides etc.).

As indicated by its name, the category of agricultural land use expresses its anthropogenic content. However, the category of land use can't be determined without taking into account the suitability factor (favourable conditions).

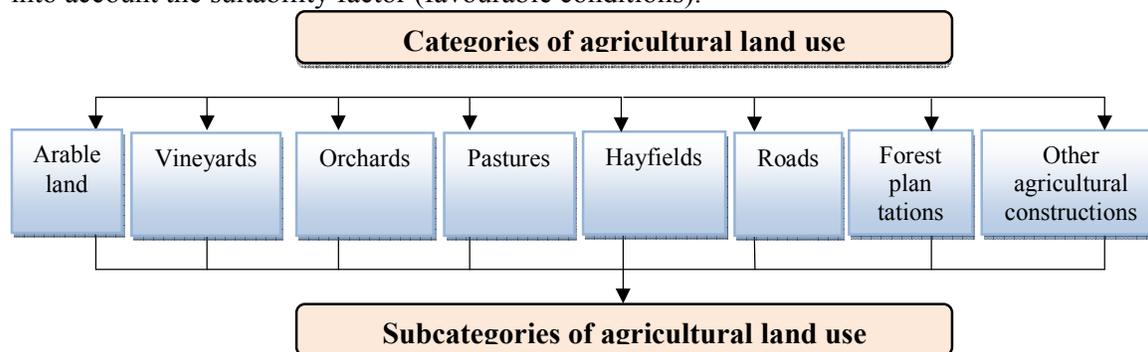


Figure 3. The structure of categories of agricultural land use
Source: elaborated by the author based on the accomplished studies

The first division within the categories of land use was carried out according to the following principles:

- *included in the agricultural cycle;*
- *excluded from the agricultural cycle.*

The category of land *included in the agricultural cycle* comprises: arable land (plowed land), perennial plantations (orchards, vineyards, etc.), hayfields and pastures.

The category of land *excluded from the agricultural cycle* comprises: forest plantations (including protective forest belts), ponds (water basins), marshes, roads, buildings, gullies, landslides etc.

Arable land - This category includes those lands that are plowed each year (or more than two consecutive years) and are cultivated with annual or perennial plants.

The arable lands designed with or improved by irrigation, drainage, terracing facilities, etc. will be distinguished as arable lands with all their area, including the areas occupied by canals, dams, billows, grass strips etc., which can't be represented by the plan scale of the agricultural parcels' location.

The rational use of arable land supposes their use according to their suitability in regime of increased efficiency and it is envisaged to prevent degradation processes (erosion, landslides, the loss of humus, water logging, salinization, compaction and others) according to the draft of Land Planning.

An example of arable land with autumn sowings is presented in Fig. 4.

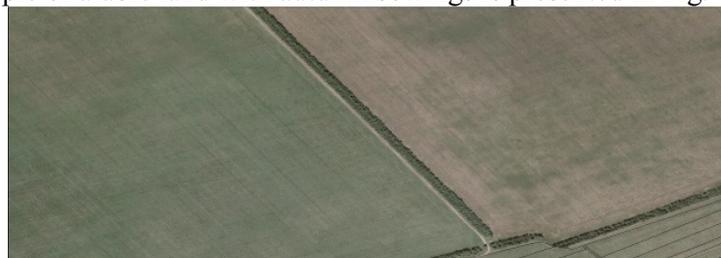


Figure 4. Arable land. Autumn sowings. Protective forest belts
Source: elaborated by the author based on the accomplished studies

When the slope exceeds 5°, the landowner carries out plowing and other basic agrotechnical activities across the slope.

In order to prevent the negative effects of water currents, protective forest belts or perennial grasses will be planted on the slope, respecting the conditions established by the existing legislative and normative acts.

The use of chemicals in the process of field crops cultivation is permitted according to the requirements stipulated in the legislation on environmental protection.

The category of “arable land” can also include other land that being permanently used for the cultivation of field crops will not create a danger of destruction by its degradation.

If the danger of destruction occurs then the arable land is transferred, as provided by norms, into another category (sub - category) of land use.

Usually, the following crops are cultivated on the arable land: *cereals, leguminous crops, oleaginous crops, technical crops, root vegetables for fodder, medicinal and aromatic plants, vegetables, and ornamental plants.*

Fallow ground - is the ground which has once been tilled. Since autumn, for a period of 1-2 years, it is not more processed or prepared for being sowed with crops.

Perennial plantations - is the land occupied by perennial plantations and it is used for tree and shrub plantations or other perennial plantations for obtaining fruit growing, vine growing, technical and medicinal products. Usually, these lands include orchards, vineyards, raspberry plantations, mulberry plantations, aromatic-oleaginous plants, hops, nurseries.

The image of a perennial plantation is presented in Fig. 5.

The use of land occupied by vineyards, orchards and other perennial plantations is performed according to the project of establishing a vineyard, orchard and other perennial plantations.

When a vineyard or orchard became the property of several physical or juridical persons, as a result of the privatization process, the landowners will respect the unique conditions regarding the use of the whole plantation, during the entire period of exploitation and according to the established technological requirements.

The terms of common land use of the parcel occupied by grapevines or orchards are established based on the draft of the regional Land Planning by the mayoralty.

Vineyards - this land use category includes the land planted with vineyards and namely:

- *noble grapevines (NG)* - including grafted and native grapevines: the first are grafted on a rootstock and the native grapevines are not grafted;
- *hybrid grapevines (HG)* - are the grapevines which are called “direct producers”;
- *plantations of hops (PH)* - are classified in this category of use because their agro-technology is similar to the one used for grapevines;
- *Grapevine nurseries (GN)* - are the land for producing grapevine planting material; these are the plantations of vine rootstocks and vine nurseries or grapevine nursery schools.



Figure 5. Orchards, vineyards, protective forest belts

Source: elaborated by the author based on the accomplished studies



Figure 6. Orchard. Protective forest belts
Source: elaborated by the author based on the accomplished studies

Orchards - represent the land planted with fruit trees in systems different from traditional planting such as:

- *orchards with intercropping system, orchards with cover crops, orchards combining the agricultural and fruit growing systems etc.* This sub-category includes the land planted with fruit trees and shrubs and namely:

◆ *intensive and super intensive orchards* are the lands characterized by high density of trees per hectare having specially trained crown forms where all maintenance and harvesting activities are mechanized;

◆ *fruit shrub plantations* are the lands planted with raspberries, gooseberries, currants, roses used for rose petal jam etc.;

◆ *fruit growing nurseries* are the lands destined to produce fruit growing planting material.

The Figure 6 presents an orchard.

Pastures and hayfields - The pastures are the lands which are covered with grass naturally or artificially by performing the seeding at intervals of maximum 15-20 years and which are used for grazing animals. This category of use includes the following sub-categories of use:

- *grassland (clean pastures)* - pastures covered only by grass;

- *woodland pastures* are those pastures which, besides the grass, are also covered with forest vegetation, with different degrees of consistency;

- *pastures with fruit trees* - are the pastures planted with fruit trees in order to control soil erosion or landslides as well as the pastures originating from derelict orchards. When including them into this category, one should take into consideration that the main production is the green mass destined for grazing, the fruits representing a secondary product;

- *pastures with shrubbery and brier.*



Figure 7. Pastures

Source: elaborated by the author based on the accomplished studies

The hayfields are the same type of lands as pastures, the criterion for distinguishing these two categories of use being the fact here crop production is mowed. This category includes the following sub-categories:

- clean hayfields;
- wooded hayfields;
- hayfields with fruit trees;
- hayfields with shrubbery and brier.

The images presented in Figure 7 reflect some fragments of the most common types of pastures in the country.

Most of the pastures and hayfields are included in the reserve fund and are therefore public property of the administrative territorial unit. The local public administration authority manages the use of pastures and hayfields for the benefit of local population according to their destination.

The modification of pastures and hayfields use category is carried out with the consent of the local council after studying the opinions and interest of local inhabitants.

For the purpose of rational use of the land occupied by pastures and hayfields, the local public administration authority, based on the draft of Regional Land Planning, implements actions to improve soil quality and status of weeds and grass content.

According to the information provided by cadastre, the area of pastures and hayfields in the country constitutes respectively 357 947 ha and 2110 ha. Unfortunately, both pastures and hayfields are in a state of increasing degradation.

The implementation of the Agricultural Cadastral Information System is ineffective and even impossible without carrying out a process of pedological studies on the entire territory of the Republic of Moldova and also without formulating correctly, from a scientific point of view, the object of agricultural cadastre [3].

3. Conclusions:

1. The category of agricultural land is determined based on the most important features and namely: the principle of suitability, feasibility and socio-economic need that can guarantee an efficient use of land.

2. The object of agricultural cadastre is the land (parcel) with or without constructions, installations or engineering facilities determined by their location in space and the landowner with his/her rights related to the land.

3. The role of the land sector (parcel) is important as object of agricultural cadastre. The constructions, installations, facilities, perennial plantations and even landowners are components of agricultural cadastre object only when the land sector is present. The object of agricultural cadastre can't exist without the existence of a land sector.

4. The correct approach to the land use category allows to formulate a logical and clear concept accepted by society and based on the principle of property rights.

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