

THE METHODOLOGICAL ROLE OF THE SUSTAINABLE USE OF PROPERTY RESOURCES

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Abstract: *Abstract: The protection and sustainable use of natural resources as a whole is currently a major problem. The methodological role in solving the problem of sustainable land use has a considerable influence, because it contains processes, methods to combat erosion, to improve and restore degraded lands, to preserve and increase soil fertility, to combat environmental pollution. These methods guide us to implement the land management project according to a consecutiveness and dependence between them with social, economic, ecological content.*

Keywords: *Land resources, sustainable use, methodology, land management project.*

1. Introduction

1.1 The actuality and importance of the topic addressed

Land resources together with human resources make up the main wealth of the country, this hypothesis, being known for a long time, has enormously influenced the conception of land exploitation in the Republic of Moldova and the terrestrial space as a whole. Precious land for the cultivation of agricultural plants was preserved and considered a priority in different situations.

A major problem in the protection and sustainable use of natural resources, as a whole, where agricultural land, forests, water, air are the main elements of life, is the coherent and adequate exploitation of land, by applying the methodologies of territorial organisation.

The sustainable use of land resources, in methodological terms, has both general and unitary content, aiming at the protection and rational use of land. In turn, the management of the land includes a series of unitary methodologies, as an example can be the fight against erosion, aimed at reducing, stopping the erosion processes, fighting the pollution of the environment, organising the settlements, irrigation, drying, etc.

The methodology of sustainable management of land represents a complex of organisational, technical, economic-financial methods, with social, economic and ecological impact, intended for sustainable use and protection of land resources, including soils, other limited natural resources.

The land management project has an important role in the implementation of the methodology, emerging from all its diversity and complexity, which represents a mechanism that allows us to solve the problem of sustainable use of the land, which includes various methods, which will serve for the rational use of land in time and space. The land management project includes a totality of methods and methodologies known by its particularities and applied at the time of elaboration by the author of the project. The land management project is flexible in time and space and represents an integral and complex idea at the elaboration stage.

1.2 The purpose and objectives of the research

The purpose of the paper is the need to implement a methodology regarding the sustainable use of land resources, through the process and methods on land management and to preserve the balance between the ecological, social, economic and legal aspect.

The objectives pursued in achieving the set goal are the following:

- Establishing the need to implement the methodology regarding the sustainable use of land resources.
- Identifying the particularities of implementing the methodology regarding the sustainable use of land resources.
- Determining the structure and content of the methodology regarding the sustainable use of land resources.

1.3 Material and methods

In the study, the problem of implementing the methodology regarding the sustainable use of land resources was examined, through the perspective of the development of land management project. As informative materials arising from the mentioned, the following were used: the statistical analysis, the legislative framework of the Republic of Moldova and of the countries in the EU space in the field of sustainable use of land resources; the scientific studies of local authors and from other countries; other information and scientific studies about the land management project.

2. The need to implement the sustainable use methodology of land resources

The agrarian reform in the Republic of Moldova left its mark, in terms of the sustainable use of land resources, through the privatisation of agricultural land, which had a huge impact on the development of the economy.

An increased problem, that always exists, consists of the land fragmentation, both worldwide and in our country, the result being influenced by the size of land properties.

Optimising the dimensions and configuration of land surfaces are required by the technological needs of the process of rational land processing, irrigation, and the implementation of crop rotation for the purpose of sustainable use.

Obviously, the mechanism for solving the problem, of the process of implementing the methods of sustainable management of land, is quite complicated and requires the establishment of a well-organised institutional and legislative structure.

An important role in the implementation of the methodologies for the sustainable use of land resources, emerging from all its diversity and complexity, is the land management project, only this project represents a mechanism that allows solving the problem of the sustainable use of land resources, which includes a complex of various particularities, principles, methods and methodologies applied in time and space.

The land management project includes a set of methodologies applied for the purpose of sustainable use and protection of land resources, which systematise and apply consecutively and proportionally to needs. The territorial organisation project can specifically support changes, depending on the principle of stability and rational use of land. In turn, this principle of stability will accompany the activity of the enterprise under the conditions of optimal dimensions and rational specialisation.

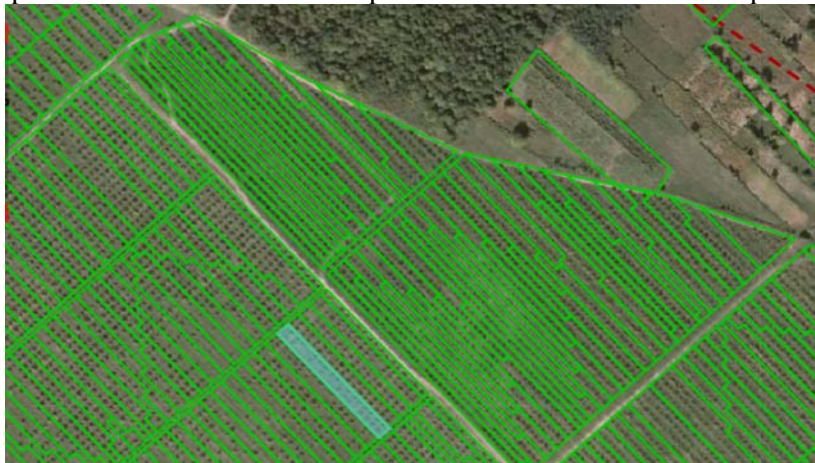


Fig. 1. Fragmentation of agricultural land

3. The particularities of implementing the methodology regarding the sustainable use of land resources.

The land management project encompasses all the methodologies applied for the purpose of sustainable use and protection of land resources. In this context, the project fulfils the role of "form", the methodologies, as a whole, are applied within the project after a certain consecutiveness. By this the project becomes a method of arranging and applying the methodologies in the process as a whole.

I have mentioned above about the fact that the land management project will be preserved even when some of its methodologies will be changed. Therefore, it is necessary for the stability in time and space of the object of the organisation, in order for this particularity of the project to be preserved. An example of stability and optimal dimensions can be found in the analysis of the dynamics of rural peasant households in the Republic of Moldova in the period 2010-2020. Thus, during the mentioned period, peasant (farmer) households with an average area of more than 10 hectares increased from 103.8 thousand hectares to 174.4, while peasant households with an average area of less than 10 hectares decreased by 142.4 thousand hectares.

4. The methodological structure of the sustainable use of land resources intended for agriculture

From the above, we can deduce the methodological content regarding the sustainable use of land resources, through the perspective of the land management project that will be based on a scenario that will include the following methods:

- Land location
- Organisation of agricultural enterprises
- Location of highways
- Consolidation of agricultural lands
- Arranging the placements
- Fighting erosion
- Land irrigation

4.1 Amplasarea terenurilor

When locating the land, special attention is paid to the location of the following important elements:
the location of the land intended for agriculture;
location of other objects, constructions, etc. with impact on the rural area;
the location of the lands intended for the forest fund;
the location of the lands intended for the water bed;

The location of agricultural land is carried out under the principles: need, possibility and capacity. At this stage, the land that, by its qualities, does not correspond to the agricultural purpose, needs to be provided for use for other purposes, for example the forest fund.

The location of the forest fund will also include two elements: the identification of the location of existing forests and, respectively, of other lands that, most rationally, should be included in the forest fund. The solution to this problem needs to be carried out taking into account the comparative weight of the forest area in the Republic of Moldova and in other European countries. Here it is necessary to note that along the way, in the territory of the Republic of Moldova, excessive deforestation was allowed, along with the excessive ploughing of pastures, hayfields, etc.

An important element of the forest fund are also the forest strips built in the process of allotments and land use planning.

The location of the water table. This compartment is important in the Land Management Project due to the fact that the territory of the Republic of Moldova is located in an area with limited water reserves, including drinking water. The water problem in the Republic of Moldova has a much more extensive and long-lasting content.

It is obvious that the main water sources (aquatic objects) (Dniester, Prut, other smaller rivers and streams) have a permanent character but at the same time quite unsatisfactory for the needs of the Republic of Moldova.

The development of the Project, in the unsatisfactory conditions of the volume of annual atmospheric precipitation, requires the search for other water sources, the application of other methodologies. For example, during the years 1985 - 1995, in the Republic of Moldova, the construction of ponds was widely practised with the aim of combating soil erosion. At the same time, the accumulation of water in these ponds represented an essential source in the process of local irrigation (small areas). Such methodology very often became an escape for farmers, especially in dry autumns for winter wheat.

4.2 Organization of agricultural enterprises

The process of forming agricultural enterprises in the Republic of Moldova is closely related to the privatisation of land and other goods which at the initial stage were called: land quotas and value quotas.

From the beginning, the process of organising agricultural enterprises faced the problem of the size of agricultural enterprises. Both "land quotas" and "value quotas" reported to a holder were small.

One of the concepts applied in the process of formation of agricultural enterprises was to preserve the minimum potential for cultivation of agricultural production in order not to admit in the process of privatisation - a food crisis.

In this context, priority was given in two directions: the formation of peasant households (farmers) and Limited Liability Companies (SRL). Both directions were based on private property (land quotas and value quotas).

4.3 Location of highways

For a normal activity, agricultural enterprises have the urgent need for communication routes and main roads. This necessity is argued from several points of view: the large volume of products transported to and from the enterprise; the need for land processing accompanied by the intensive movement of equipment; the need to monitor crops, etc.

In the absence of a system of main roads in the area of the town hall, the potential of agricultural enterprises will decrease essentially. Such a situation will have a negative influence on living conditions. Therefore, the problem of main roads for the purpose of serving agricultural enterprises is a social problem, which can be solved at the state level, by subsidising the construction of main roads to serve agricultural enterprises, in the rural area.

4.4 Consolidation of agricultural lands

World practice is known with land consolidation. The land consolidation methodology is a component of the land management methodology. For these reasons, within the land management project, the land consolidation methodology must be applied.

Consolidation of agricultural land includes several methods: sale - purchase; change; long-term lease; redefinition of borders; land association. In the process of developing the land management project, we can face the situation when the development of the project is impossible without the implementation of consolidation methods.

The role of land use in all progressive methods of rational land use is known. On the other hand, the implementation of a subdivision depending on its content requires, in each specific case, compact areas of land. In the situation created, under the conditions of privatisation through excessive parcelling, compact surfaces for the creation of housing estates, a long time will be a problem.

At the current stage, it is useless to analyse the dimensions of the errors admitted in the process of privatisation through excessive parcelling. It is more correct to analyse society's ability to solve the problems that have arisen.

Land consolidation is an eternal process (more correctly, a phenomenon). Within the land management project, three methods of consolidation are requested more often, out of the five mentioned above: land exchange, long-term lease, association of land owners.

Land for constructions, located in rural areas, that can have an impact on the environment and the agricultural production process is diverse. Here we will find the location of individual houses (villages), industrial objects (factories, plants), raw material processing. In the process of developing the land management project, it is necessary to know the mentioned objects, which will influence the implementation process of different land management methodologies. An example can be the placement of vegetable crop rotation and vegetable processing objects. The location of the processing objects near the base of the raw material will influence the prime cost of the production through transportation expenses.

4.5 Arranging the placements

One of the most important methodologies to combat erosion is the correct establishment of the structure of crops and their rotation in crop lands. Annual and perennial grasses in the structure of crops, autumn crops (wheat, rye) other crops sown often, having a low coefficient of erosion also represent a considerable protection.

Crop rotation represents a whole methodology in the process of sustainable land use. Lands that are not affected by the danger of erosion are identified for the purpose of placing some plots to be cultivated.

The need to concentrate crops in crop rotations is primarily required by the requirements of the optimal application of the technique in the process of servicing (care) of the plants. Namely, the expenses sustained in the process of mechanised land work, plant care represent an important source of reducing the cost of a production unit.

4.6 Fighting erosion

The soils of the Republic of Moldova are subject to the danger of erosion. By this, the economic activity in the rural area must be oriented towards combating the danger of erosion. Under the notion of erosion is understood: the washing of the soil by the flowing water of rain and snow and the blowing by the wind of the fertile top layer of the soil.

- The organisation of land in conditions of erosion includes compliance with the following basic principles:
 - the development of measures to combat erosion is necessary to be carried out on the entire surface subject to danger, regardless of the destination of the land and the production process carried out;
 - the consecutiveness of the development of measures to combat erosion, namely, at the level of: the republic; district; locality; enterprise; land;
 - the complex development of the project according to the component parts: specialisation; shape and dimensions; establishing the land structure; the structure of employment; setting up the accommodation;
 - argumentation of project decisions: economic, ecological, social.

4.7 Irrigation/drying of lands

Irrigation becomes a conceptual methodology in the agriculture of the Republic of Moldova. Seen through the prism of climate changes, irrigation can be considered as a necessity without which the agriculture of the Republic of Moldova cannot exist. This conclusion is confirmed by the last 10 years in a row.

In the conditions of the deficit, the organisation of the water use process becomes an important element in the management of land. The coordination of the implementation of the solaments, the process of combating erosion, the irrigation of crops, becomes an integral social and economic problem.

Solving the problem includes, first of all, assessing the volumes of water that can be used and their location. This is a national issue. The water sources that can be used for irrigation purposes in the Republic of Moldova are:

- water resources (rivers: the Nistru, the Prut, the Răut and other streams that can transport volumes of water to the irrigation object).
- limited water storage ponds.

It is necessary to note that during the years 1985-90 the irrigation capacity of the existing system and water sources exceeded the surface of 250-300 thousand hectares, quite a lot for the needs of the Republic of Moldova. Regrettably, at the current stage the irrigated surface is 10 times smaller. In such conditions, the danger of dry years is much more advanced, if we also take into account the aggressiveness of the climatic conditions.

5. Conclusions

The sustainable use of land resources aims to protect the environment, by combating pollution, by rationally managing land, by combating erosion, in order to achieve high productivity with minimal expenses and a decent living, etc.

Due to the fragmentation of agricultural land, the problem of rational land processing has arisen, that is, the development and application of the methodology regarding the design of the land management, which includes in itself:

- the organisation of crop rotations, which will allow the imitation of natural ecosystems and the qualitative and quantitative increase of land productivity;
- combating soil pollution and erosion, which directly influences the agrophysical properties of the soil;
- reparceling or consolidation of lands, which will increase the productivity of lands through their rational processing;
- the location of main roads that will improve the service of agricultural enterprises which can be solved at the state level by subsidising the construction of main roads;
- the arrangement of croplands through the application of which the problem of combating erosion, maintaining or increasing soil fertility will be solved, which will lead to higher productivity
- irrigation becomes a conceptual methodology in the agriculture of the Republic of Moldova. Through the prism of climate changes, irrigation can be considered as a necessity without which the agriculture of the Republic of Moldova cannot exist.

Following the study on the issue of sustainable use and protection of land resources intended for agriculture, we found that the development of the methodology on the sustainable use of land is inevitable and plays an important role in the future development of the economy of the Republic of Moldova. The implementation of the developed methodology will allow land improvement, by maintaining or increasing soil fertility, combating erosion, combating environmental pollution.

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