

## THE ESTIMATE OF SUSTAINABLE LAND MANAGEMENT IN UKRAINE

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DOI: <https://doi.org/10.30525/978-9934-26-256-2-10>

Sustainable land management (SLM) comprises measures and practices adapted to biophysical and socio-economic conditions aimed at the protection, conservation and sustainable use of resources (soil, water and biodiversity) and the restoration of degraded natural resources and their ecosystem functions [1].

Overall, sustainable management of land (soil) resources is based on crucial parameters. However it requires an improving system of indicators, including the use of cost (monetary) evaluation [2]. We have the normative monetary evaluation of agricultural land, which is used on real economics activity. It is closely relation with methodology of rental income [3]. Also, it has a lot of weaknesses [2; 3]. Besides, previously had been obtained results our research, which evidence about setting enough quantities disadvantages [3].

However, issue appears is not only through a low evaluation base of rental income, which behind the real productivity of the agriculture land (firstly by arable land) and possible realization their existing (internal) potential [4]. One of the indicators of the presence of issues related to the expanded reproduction of agricultural land, than we have through weak development of institutions and the low efficiency of the functioning of the relevant institutes. The imperfection of the work of the institutions causes significant problems regarding the possibility of implementing the intended plans, the inability applying (functioning) in an automatic mode, because it requires constant external intervention in these processes, and restricting the budgets for the execution of works.

One of these issues are the normative monetary evaluation of agriculture land (NME). In previous research the discrepancies between the methodological approaches to the NME of arable land are substantiated and revealed due to the quantitative distribution of the values of the indicators depending on the sinusoidal function and as a result of their positioning (placement) on the trigonometric circle. Where normative monetary evaluation of arable land for five crops differ significantly from solution by method for cereals, while distribution amount NME of arable land for the latter in terms of absolute and relative comparison is inferior same too [3, p. 41].

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The method of normative monetary evaluation (NME) of agricultural land have existed an important weakness concerning their quality. The existence at least difference between the two methodological approaches to the NME of arable land is proofed. Handling the index of the humus content in soils as one of many parameters of land quality assessment in the Poltava region of Ukraine proves the advantages of the second methodological approach, within which the objects of the rent income formation are five agricultural crops, such as: winter wheat, spring barley, corn, sunflower and sugar beet. According to application of the second methodological approach makes the NME of arable land, thus it dependent on the content of humus (variation of the NME of arable land by 60,1 % is caused by the variation of the content of humus), as the variation of the NME of arable land on cereals is explained by the investigated factor only by 14,8 %. Improvement undertaken has shown that the value of the NME of arable land on five agricultural crops exceeds the value, obtained on cereals, and such increase doubles under conditions of the high humus content in soils [5, p. 1567].

Such approach into improvement the methodology of NME, will allow to qualitatively increase the level of tax, balancing other land relation for land use and registration of property rights to it. This is crucial an issues, when precisely taxes, in particular, which influence on accumulation of funds for land protection [6]. However, there is a significant not enough them, which is why more than once offer have been made to increase tax rate the land.

It has not been fully clarified, what extent the existing methods and their offered modifications or improved options are capable of assessing the sustainable management of soil (land) resources. In this context, it is worth developing analytical packages for determining trajectories of movement and equilibria within the limits of the investigated issues. That is, to provide strictly mathematical accuracy to such models in the management system, only after that we should talk at least about the qualitative parameters of the models in the regulation of sustainable land use processes.

One of these directions, based on already conducted research, is considering the further application of functions with harmonic oscillations. At the same time, taking into account the randomness of the processes as both economic and natural components to sustainable soil (land) management, this requires a wide application of a combination of harmonic oscillations with stochastic functions. Thus, stochastic harmonic models (SHM) are prioritized for application [5, p. 1563].

During the evaluation of the effectiveness of crop rotations in accordance with the normative costs for growing agricultural crops, the improved methodology of normative monetary evaluation (NME) of land proved itself qualitatively, as it acted as a cost indicator when comparing different technologies for growing agricultural crops in the conditions in the subzone of insufficient hydration Forest Steppe of Ukraine [7, p. 154; 8]. In matters of anti-

erosion measures, it was also successfully tested, showing high economic and ecological results, especially in solving issues of crop structure optimization.

Another issue which involves set of measures, which outlines and provides an economic assessment to use the land resources, should include technological features that directly use agricultural land [7; 8]. However, it is worth noting that for expansion of reproduction natural complexes relative with land resources (fertility), it is necessary significantly improve the methodical approach to calculation (more objectivity) normative monetary evaluation (NME) of land, separated it as usually updating information imaginable as halfway (half measure), where we must not restrict only this step, because will be wrong.

The categories of reproduction, sustainable land management (SLM) and evaluation of land resources are quite related in establish project tasks [4; 7]. The concept of rent [8] was a join to research on the effectiveness of land use and its protection from heavy metal contamination [6]. The technological and organization paths (measurements) have chosen in organic farming [7], an establish the project of poultry-peat compost [6], apply calcium-iron sludge (CIS) and different variations irrigate land was also carried out using a monetary (cost) approach [6], projects on irrigation of agricultural crops in which the issue of modeling random variables on the economic effectiveness and efficiency management of soil resources in conditions of moisture shortage is considered.

These projects have computed effectiveness and they based high ability to quality assess in sustainable land management is showed. The economic assessment of land is directly related to economic activity. Therefore, NME as indicator allows considered its as a tool to SLM.

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