IMPROVING THE METHODS OF APPRAISAL AND DEFINING THE QUALITATIVE STATE OF LAND ON THE INFORMATIONAL BASIS

Galiuna Pogrischuk,
Candidate of Economic Sciences,
Vinnitsa Training and Educational Institute of Economics,
Ternopil National Economic University

Annotation. *The article proposes improvement of the methods of evaluating and estimating the qualitative state of land areas on a new informational basis through substantiating the methodical approach to cost (regulatory) evaluation of arable lands. The approach is based on crop capacity indices of winter wheat (natural crop capacity) and regulatory production costs on its cultivation (according to the technological charts without adding fertilizers). The expediency and the spheres of application of the indices of soil appraisal are substantiated. The transition to spatial time methods with the help of modern geo-information technologies of soil monitoring and their separate properties is proposed.*

The proposed methodological approaches and the obtained results have practical value, that is the basic theoretical, methodological and methodical developments are brought to the level of methodical and practical recommendations.

Keywords: *agricultural land, evaluation, determination of the quality of lands, appraisal.*

The issues of capacity of agricultural lands become crucial to the development of the agricultural sector. That land resources serve as the main means of production in the whole agricultural complex, but not just in agriculture. On the whole, land assessment , which measures the economic fertility is important in the management of land resources, improvement of the economic mechanism of the agricultural sector, in developing appropriate regulatory planning and economic incentives for agricultural production, the development of tax system, rent payments, rent, at a comparative analysis of production efficiency and solving other problems associated with the use of the land.

According to G. Kireytseva: "The land in agriculture is the main means of production and unlike other tools, it is indispensable, has no reasonable monetary assessment and under the conditions of the proper use retains its qualitative properties as a unique means of agricultural production" [1].

In its turn, the issue of efficient use of agricultural land in Ukraine is increasingly worsening. Today it has different aspects, the main of which are economic, institutional and environmental ones. The level of use of land in Ukraine is now so critical that further potential degradation of land resources in agriculture can have dramatic consequences, which will surely affect the overall level of food security and welfare [2].

For the period of research conducted by research and project institutes, a lot has been done to evaluate soils according to the vegetation and natural climatic factors. The scientific society and practitioners are increasingly pointing to the need of land estimating and performing economic activities taking into account regional differences in natural economic potential.

in a certain climatic area. As for the state soil cadaster formation, the received indices of bonitation are entered to its data.

Soil bonitation can be regarded as continuation of the land survey prior to their complex assessment in economic terms. The main objective of the appraisal is to determine the relative quality of the soil fertility, i.e .establishing how many times one soil is better or worse than another according to its natural and acquired properties [5].

According to the scientist and the author of the agro-industrial groups A. Canas appraisal can be viewed as a specialized classification of soils by natural properties characterizing their fertility concerning various crops and reflects the degree of compliance of soil with biological needs of specific crops [6].

According to the scientist A. Tyhenko [7], currently the most alarming situation in the agricultural domain of the country is a steady decline in soil fertility. The state of Ukraine's land resources is worsening, the areas of man-made pollution are expanding.

According to B. Danylyshyn, the primary step towards improving the quality properties of agricultural soils, is to optimize farming through rationalize land stock and land management, environmentally friendly land use, increasing the limits of soil protection. [8].

Negligent management significantly destroyed the ecological balance, agricultural land, increasing the share of lands damaged by wind and water erosion, and as a result partial soil collapse and its dehumification. Due to the deterioration of the quality properties of land, their productivity in the agricultural sector remains very low, mainly due to unsustainable land use and the absence of land protection measures. [9].

Bonitation work is performed according with the Methodological guidelines on soil bonitation. This method involves the following stages: clarification of natural and agricultural zoning of land resources; compiling lists of agro-industrial of soil groups agroeconomical substantiation of crops allocation; collecting and processing data on the quality of soil; selecting soil standards for appraisal; calculation bonitation points. The guidelines also offer the approaches to soil bonitation under perennial plantations feeding grounds and to the quality of farm soil.

To determine the points for each agricultural group in each natural agricultural region, mapped charts for cultivations of the most common crops are made up. For arable land suitable are the following crops, such as winter wheat, winter rye, barley oats, maize, sunflower, sugar beet, potatoes and flax. For each cereal points of bonitation are determined separately.

Bonitation points are established according to objective, common natural soil properties which are correlated according to crop productivity. In different natural agricultural regions correlation between the soil properties and crop capacity is different. If the value of correlation rates are within 0,7 to 1, it testifies to a close link of capacity indices and soil properties. During soil bonitation the grade of their compliance with the requirements to crops is determined, taking into account those soil properties whose dynamics is the least and they correlate well with crop capacity. To such soil properties we can refer: humus amount in one layer in genetic horizons; humus layers capacity; the amount of lay; the physical state index; the salinity grade; soil gritty con-

sistence; acidity (pH level of the salt extract); gleization; the amount of nutrient (phosphorus and potassium); erodation; erosion with water.

According to the bonitation points two appraisal scales are made up: the firs shows objective, natural and acquired soil properties, the second shows the cro capacity for arable lands or the forage mass yield on hey lands or pastures.

The bonitation scales can be closed or open. If we take as an etalon the soils whic according to their natural properties belong to the most fertile ones, or this etalon ca be the index of maximal crop capacity, the scale is called closed. If natural propertie and capacity indices of the domineering soil type are taken as an etalon, the appraisa scale is called open.

The bonitation points are gathered to the appraisal scales, which after the chec are used for soil appraisal at farms on the territory of the agricultural region. The quali ty of bonitation scale is checked by the validity of its main appraisal item — 1 point.

To evaluate the agricultural lands within the inhabited areas, where there are n materials of soil appraisal, extrapolation soil maps are made. For this purpose soi maps of adjacent regions and the materials of airborne photoshoots of other examina tions are taken in order to compare the diagnostic properties of examined and not ex amines lands. The showed on the extrapolation map soil changes are united into agri cultural indiustrial soils with the corresponding bonitation points.

The bonitation scales within the natural agricultural regions enable to perform soi ranging according to its capacity within one region.

In order to transform the obtained bonitation scales of certain regions and form a overall national system to which the point scale is determined and unified (dependin on the zone of cultivation) ecological coefficients are used. They are calculate through the correlative index of crop yield for several years on the soil of the etalo sample, in the defined natural agricultural region and its yield where it is cultivated.

The bonitation indices are most suitable for:

- land management, to take measures on proper land use and land protection, pre serving and increasing soil capacity;

- regulatory monetary appraisal of a separate patch of land (bonitation point of th agroindustrial group of soils and a bonitation point of a hectar of cultivated farmland i a farm are taken into account);

- expert monetary ground bonitation while comparing sale prices of simila grounds of cultivated farmland among other factors qualitative features of the grounds such as fertility and estimated productivity are taken into account;

- when estimating costs of agricultural production caused by extraction of farm land (arable farmland, perennial plantations, hey land, pastures) for non-agricultura purposes, the bonitation point of the extracted ground as well as the bonitation point o the farmland in the Crimea, region and cities of Kyiv and Sevastopol.

According to the research, conventional methods of soil monitoring and (or) o their separate properties based on local, single observations, do not provide an ade quate appraisal of the state of the soil coverage. Therefore, it is necessary to make transition to spatial time methods with using modern geoinformational and aerospac technologies. The late are increasingly used due to their operational capability, objec

sistence; acidity (pH level of the salt extract); gleization; the amount of nutrients (phosphorus and potassium); erodation; erosion with water.

According to the bonitation points two appraisal scales are made up: the first shows objective, natural and acquired soil properties, the second shows the crop capacity for arable lands or the forage mass yield on hey lands or pastures.

The bonitation scales can be closed or open. If we take as an etalon the soils which according to their natural properties belong to the most fertile ones, or this etalon can be the index of maximal crop capacity, the scale is called closed. If natural properties and capacity indices of the domineering soil type are taken as an etalon, the appraisal scale is called open.

The bonitation points are gathered to the appraisal scales, which after the check are used for soil appraisal at farms on the territory of the agricultural region. The quality of bonitation scale is checked by the validity of its main appraisal item — 1 point.

To evaluate the agricultural lands within the inhabited areas, where there are no materials of soil appraisal, extrapolation soil maps are made. For this purpose soil maps of adjacent regions and the materials of airborne photoshoots of other examinations are taken in order to compare the diagnostic properties of examined and not examines lands. The showed on the extrapolation map soil changes are united into agricultural indiustrial soils with the corresponding bonitation points.

The bonitation scales within the natural agricultural regions enable to perform soil ranging according to its capacity within one region.

In order to transform the obtained bonitation scales of certain regions and form an overall national system to which the point scale is determined and unified (depending on the zone of cultivation) ecological coefficients are used. They are calculated through the correlative index of crop yield for several years on the soil of the etalon sample, in the defined natural agricultural region and its yield where it is cultivated.

The bonitation indices are most suitable for:

- land management, to take measures on proper land use and land protection, preserving and increasing soil capacity;
- regulatory monetary appraisal of a separate patch of land (bonitation point of the agroindustrial group of soils and a bonitation point of a hectar of cultivated farmland in a farm are taken into account);
- expert monetary ground bonitation while comparing sale prices of similar grounds of cultivated farmland among other factors qualitative features of the grounds, such as fertility and estimated productivity are taken into account;
- when estimating costs of agricultural production caused by extraction of farmland (arable farmland, perennial plantations, hey land, pastures) for non-agricultural purposes, the bonitation point of the extracted ground as well as the bonitation point of the farmland in the Crimea, region and cities of Kyiv and Sevastopol.

According to the research, conventional methods of soil monitoring and (or) of their separate properties based on local, single observations, do not provide an adequate appraisal of the state of the soil coverage. Therefore, it is necessary to make a transition to spatial time methods with using modern geoinformational and aerospace technologies. The late are increasingly used due to their operational capability, objec-

tive character and relative affordability, as well as unique ability of one-time coverage of large territories.

In Ukraine the issue of bonitation of farmland is becoming of great importance, especially for economists of the agrarian sphere and other specialists who deal with agriculture. This all is explained by the fact, that land through its fertility is not only the main production means in agriculture, but also an important component of the productive capital, an object of innovative investment activity, i.e. assets that is used in the process of agricultural production.

The methodological basis of land appraisal is the doctrine of land as the main means of agricultural production. Land resources are specific elements of commodity-money relations. They are carriers of item properties, but there are features that significantly distinguish them from other elements of the economic system and significantly limit the effect of traditional economic characteristics. Traditional economic characteristics inherent to goods are their exchange value and price. Land resources involved in commodity-money relations have also these characteristics. The exchange value of natural resources is the amount of money big enough to satisfy the needs in certain natural resources. Price is the number of means for which the seller agrees to sell and the buyer is willing to buy an item. [10].

S. Sumlinniy suggested appraisal of land resources according the indices of expenditures on their overall development and appropriation to farming [11]. His methods was based on defining the level of labour payment involved into the development and appropriation of lands to farming, productivity norms and labour accumulation, labour pay increase. Considering all these indices makes up the value of ground appraisal.

According to A. Wahnshtein, to appraise land it is necessary to use an expenditure approach, estimating expenditures for the economic soil fertility. [12]. To these expenditures it is necessary to include the total part of the accumulated and materialized labour within all the period of land use and annual values increase.

In agriculture land is the main production means. The quality of the cultivated crops depends on its level of fertility, location and the level of farming.

In the Soviet Union little attention was paid to land leasing. The main reason was the absence of private ownership for land, and people's property was at the core of the land ideology, which meant that the obtained revenue had to belong to people too.

However the experience shows economic senselessness of such an approach. Thus, the development of cost accounting relations, especially in the 1960s, forced the search of mechanisms of its definition and consideration basing on the valid experience of agricultural production.

Thus, O. Cheremushkin and P. Vedenichev pointed at the fact, that taxation requires the use of information about return and profitability of production which are considerably related to the soil fertility value. Besides, the primary land cadaster task is definition and monitoring of farmlands fertility. Making up cadaster entries is caused by the need of human labour distribution, intensity of work and direct correlation of production outcomes with natural soil fertility. Thus, according to the scientists, we

don't perform objective assessment of the results of agricultural activity and do not take into account the overall amount of leasing payments[13].

The use of this approach was characterized by introducing purveyance prices of differential type for agricultural products depending on certain production conditions. According to O. Kovalyshyn, with the introduction of such proposals into practice, the state partially imposed lease payments by zone pricing and direct lease [14].

Everything mentioned above testifies to the scientific search for the most optimal methods of assessing profitability of lands through various methods of bonitation of natural resources.

It has been proved, that the main factors of influence on the farmland value are:

- natural climatic factor defining the agricultural specialization, crop choice for the certain location;
- type of land management, the agricultural specialization (meat, dairy, grain or vegetable) and the main forms of agricultural organization (large industrial enterprise or its part, a farm, private entity, horticultural plots);
- structuring areas under crops and the systems of crop rotation;
- types of farmlands (arable land, hay land/meadow, pasture etc.) and harvested crops (grain, linen, vegetables, oil crops etc.);
- technological characteristics, fertility, other soil properties influencing the crop capacity and the level of soil capacity of farmlands;
- the yield level of the main crops due to intensive horticulture and husbandry on the certain territory (object location);
- allocation regarding sale markets, primary processing enterprises and the maintenance centres; improvement of farmlands (melioration);
- the density of population, employment level, demographic features, social condition;
- prices for fuel and agricultural machinery; facilities (available roads, melioration systems etc.).

Suffice it to account, that while performing the farmland appraisal it is possible to estimate:

- farmlands and other lands or vacant sites appropriate for farming;
- built-up areas with buildings for various use;
- agricultural property complex (agricultural immovable property) including farmlands, buildings, agricultural machinery, perennial crops and vegetation, productive and working cattle etc.

According to the conducted researches, the current bonitation of farmlands in Ukraine used to satisfy the industrial and private needs only for some time and played an important role in establishing market relations in the agricultural sphere and land management.

Monetary appraisal of lands should become their characteristic feature since it is based on the data of soil bonitation and economic land estimations, which considers crop productivity level, production costs and their efficiency.

Conclusions. The new methodological approach based on the regulatory values according to the developed algorithm provides the regulatory monetary appraisal of

each agroindustrial soil group, and on this basis — the bonitation of a separate land taking into account the soil structure in agrogroups, the overall land area, economic agent, administrative region, Ukraine.

The new information basis applied in practice of calculating the indices of regulatory (monetary) land appraisal will enable the total and objective bonitation of farmlands in market relations. Thus, the lease pay for land use, as well as the taxation value for plots will be objectively calculated; the level of money supply to the budgets from lease will stabilize, which will induce the innovative environmentally friendly development of the agrarian sector.

References:

1. Kireitsev G. G. Accounting of the fized assets in agricultural enterprises / G. G. Kireitsev. — K.: Urozhai, 1987. — 176 p., P.143.

2. Novikov O. Y. Economic effectiveness of farmland use and development of land-borne relationships in the region / O. Y. Novikov // Thesis for the scientific degree of PhD of economics. — Mykolaiv: MDAU. — 2006. — 206 p.

3. Novikov O.E. Economic effectiveness of farmland use and the development of land-borne relationships in the region / O. U. Novikov // abstract of the thesis for the scientific degree of PhD of economics: specialty 08.07.02 «Economics of agriculture and AIC» / Novikov Olexanr Yevhenovych . — Mykolaiv, 2006. — 22 p.

4. Methodical guidelines on soil bonitation. – K.: UAAS, 1993. – 96 p.

5. Ignatiev S. Y. Transparent land: study guide. — Kharkiv: «TNC»Ltd, 2008. — p. 163–164.

6. Kanash O. P. Soil bonitation : changes proposed, are they worth? / O.P. Kanash // Land management bulletin. – № 5. — 2008. — P. 46–50.

7. Tykhenko O. V. Comparative analysis of bonitation methods of soils in Ukraine / O. V. Tykhenko // Bulletin of the National agrarian university. — 2010. — № 6. — P. 33–39. — [e-resource]. — Available at: www.nbuv.gov.ua/old_jrn/Chem_Biol/Vkhnau_ekon/2010_6/pdf/6_33.pdf

8. Danylyshyn B. M. Natural resource domain of Ukraine: problems of sustainable developmeny and transformations / B. M. Danylyshyn. — K.: Nichlava 2006. — 704 p.

9. Kopsytsia Y. Priorities in enhancing social economic effectiveness of land management [e-resource] / Yaroslav Kosytsia // Social economic issues and the state. — 2015. — Vol. 2 (13). — P. 192–200. — Available at.: http://sepd.tntu.edu.ua/images/stories/pdf/2015/15kyoeez.pdf.

10. Zamula I. V. Appraisal of farmlands / I. V. Zamula // International collection of scientific works. — 2008. — № 1(10). — P. 97–107.

11. Strumilin S. G. About the value of "bestowed natural resources" / S. G. Strumilin // Voprosi ekonomiki. — 1967. — №8. — P. 60–72.

12. Wanstein A. L. The accounting of natural resources as part of national wealth and economic balance / A. L. Wanstein // Voprosi ekonomiki. — 1965. — №7. — P. 67–73.