

ECONOMIC EFFICIENCY OF LAND USE BY AGRICULTURAL PRODUCERS IN THE SYSTEM OF THEIR NON-CURRENT ASSETS ANALYSIS: A CASE STUDY OF THE AGRICULTURAL SECTOR OF UKRAINE

Tetiana O. SHMATKOVSKA¹, Mykola I. DZIAMULYCH^{2*}, Valentyna M. YAKUBIV³,
Olha A. MYSHKO^{2**}, Liudmyla V. STRYZHEUS^{2***}, Roman D. YAKUBIV³

¹Lesya Ukrainka Eastern European National University, Department of Accounting and Audit, 28 Vinnichenko str., Building 7(G), 43021, Lutsk, Volyn region, Ukraine, Phone: +38 0332 242 145;. Emails: shmatkovska2016@gmail.com, 7tresure@ukr.net

²Lutsk National Technical University, *Department of Economics, **Department of Entrepreneurship, Trade and Exchange Activities, ***Department of Management, 75 Lvivska str., 43018, Lutsk, Volyn region, Ukraine. Emails: m.dziamulych@lntu.edu.ua, l.stryzheus@lntu.edu.ua, o.myshko@lntu.edu.ua

³Vasyl Stefanyk Precarpathian National University, Department of Management and Business Administration, 57, Shevchenko Str, 76018, Ivano-Frankivsk, Ivano-Frankivsk region, Ukraine. Emails: yakubiv.valentyna@gmail.com, romanyakubiv2@gmail.com

Corresponding author: shmatkovska2016@gmail.com

Abstract

The paper substantiates that because the soils ploughing level in Ukraine has not changed for a long time, soil depletion is growing every year. As a result of the formed culture tendencies which grow on such lands, every year will lose productivity, and consequently, the efficiency of managing the agricultural enterprises systematically decreases. Cartogram of Ukrainian regions grouping by the average annual rent for the agricultural land use is given. It was found that that in the current business environment in Ukraine, the amount of rent does not depend on the soil fertility level, because in most western, southern and south-eastern regions of Ukraine, where the most fertile soils are concentrated, the level of rent is relatively low. In addition, it should be noted that the agricultural land of public and private ownership renting cost differs significantly from each other, which we found by comparing the data of the relevant cartograms of Ukraine. We systematized the results of the impact factors assessing on the sale of gross output of agricultural enterprises of Ukraine in 2014 – 2018 by analysing the dynamics of the return rate on their fixed assets and the factors that influenced its formation. The results of the factor analysis will make it possible to identify the quantitative impact of factors on the efficiency of non-current assets of agricultural producers, the significant share of which is directly occupied by land resources. The work is systematized the results of assessing the impact of factors on the return on assets of agricultural producers of Ukraine for 2014 - 2018 by identifying the factors that influenced its formation by determining their quantitative impact through factor analysis methods, including the method of elimination. It is substantiated that having significant and quite high-quality reserves of fertile lands, Ukraine is 2–3 times less productive than developed countries, which is evidence of inefficient use of agricultural land by agricultural enterprises of Ukraine. In our opinion, the main task of the state to rationalize and establish the efficient use of land resources in the agricultural sector is to introduce a number of measures to ensure efficient land use.

Key words: economic efficiency, agricultural producers, land resources, non-current assets, cartogram

INTRODUCTION

Land and land resources are the basis for the economy of any country, and especially for agriculture.

Land in agriculture performs two important functions, such as the object of labour (when a person's activity affects it, changing its

surface) and tools (when a person uses the physical, mechanical and biological properties of the soil to obtain the desired result). Therefore, land is the main asset for agricultural enterprises.

Since every owner-agricultural producer wants to minimize resource costs, the question arises in choosing the land use method. It is

important for farmers, as well as for the country as a whole, to use efficiently and sparingly the exhaustive and limited resources to which land belongs. Therefore, the issue of economic efficiency of land resources use and management by agricultural enterprises in the Ukrainian agricultural sector does not lose its relevance.

The work of many scientists is devoted to the study of this issue, in particular such as: Andriichuk V. [1, 2], Boiar A. [3], Dobrovolska N. [7], Dziamulych M. [8, 9, 26], Hutorov O. [11], Hordienko V. [10], Lavruk V. [12], Musyka P. [15], Popescu A. [16, 17, 18, 19, 20, 21, 22, 23, 24, 25], Sodoma R. [28], Tofan I. [31], Shulyk Y. [32], Yakubiv V. [34, 35, 36], Zhurakovska I. [37], etc.

The purpose and objectives of this study are to assess the economic efficiency dynamics of land resources use and management by Ukrainian agricultural producers in the factor analysis system of their total non-current assets efficiency and identify factors aimed at improving such efficiency.

MATERIALS AND METHODS

In the study of the land use efficiency by Ukrainian agricultural producers, the official statistical data published by the State Statistics Committee of Ukraine for the relevant period under analysis were used.

To calculate the ploughing level of agricultural land was used the formula:

$$L_p = \frac{S_{al} + S_{pp}}{S_{agl}} * 100 \%,$$

where: L_p – ploughing level of agricultural land;

S_{al} , S_{pp} , S_{agl} – areas of arable land, perennials and all agricultural land, respectively.

In order to identify factors to improve the efficiency of land use by agricultural enterprises, a factor analysis of the gross output volume and return on assets of agricultural enterprises using a set of elimination methods.

When conducting factor analysis, the method of chain substitutions was used, according to which the calculations were performed using a set of the following formulas:

$$Z = \frac{X}{Y},$$

where: Z – performance indicator;

X , Y – indicators (factors) that affect the performance indicator.

$$Z_0 = \frac{X^{p.y.}}{Y^{p.y.}}$$

$$Z_1 = \frac{X^{r.y.}}{Y^{p.y.}}$$

$$Z_2 = \frac{X^{r.y.}}{Y^{r.y.}}$$

where: $X^{p.y.}$, $Y^{p.y.}$, $X^{r.y.}$, $Y^{r.y.}$ – indicators for the previous and reporting years, respectively.

$$\Delta Z^X = Z_1 - Z_0$$

$$\Delta Z^Y = Z_2 - Z_1,$$

where: ΔZ^X , ΔZ^Y – measure of the factors influence on the performance indicator.

For the successful implementation of the analyzing process the return on assets of agricultural producers used a set of formulas:

$$R/a = \frac{Q}{FA},$$

$$Q = FA * R/a,$$

where: R/a – return on assets;

Q – gross sales volume;

FA – fixed assets value.

In the study of the agricultural producers return on assets and their factor analysis was used the formula:

$$R_a = \frac{P}{FA} * 100\%,$$

where: R_a – return on assets;

P – net profit.

RESULTS AND DISCUSSIONS

According to the Land Code of Ukraine, all lands are divided into categories with different purposes [29]. Land used for agricultural production is agricultural land, which is further divided into agricultural land (arable land, perennials, hayfields, pastures and fallow lands) and non-agricultural land (land under farm buildings and household infrastructure elements).

In the land management process, the main indicator for assessing the land management quality is the land use efficiency. According to the study results, scientists have identified the following land use efficiency types in agriculture (table 1).

Table 1. Land use efficiency types in agriculture

Efficiency type title	Characteristics of the efficiency type
Natural	The effectiveness provided by natural fertility, location in markets, climate, topography, configuration, acquisition of resources.
Structural	The efficiency based on the agricultural land-use intensity.
Technical	The ability of an enterprise to produce a volume of products using a minimum of resources or to produce as many products as possible using a certain amount of resources.
Technological	The result of the production factors interaction, which characterizes the achieved productivity of living organisms used in agriculture as a means of production.
Economic	The ratio between resources and production results, according to which production efficiency cost indicators are obtained.
Expensive	The result obtained due to the existing level and costs structure during production.
Social	The compliance of the economic activity results with the basic social needs and social goals.
Ecological	The ecological environment preservation while increasing production productivity and providing the population with ecologically clean food products.
Energy	The efficiency of the available energy capacity use.
Investment	The effectiveness of resources investing.
Socio-economic	The result of meeting human needs and industrial development.
Ecological and economic	The economic efficiency of environmental costs during agricultural activities.
Production and technical	The comprehensive efficiency of labour resources, a set of material and technical base, technology and production organization, and marketing methods, the interaction of which affects the production cost.
Production and economic	The result of the combined impact of production and technical efficiency and economic policy of the enterprise.

Source: Systematized based on [1, 2, 4, 5, 6, 7, 10, 11, 12, 14, 27, 33].

According to the State Land Agency of Ukraine, as of the beginning of 2020, the total

area of agricultural land is 42.79 million hectares, which is 71.0% of the total area of Ukraine (Fig. 1).

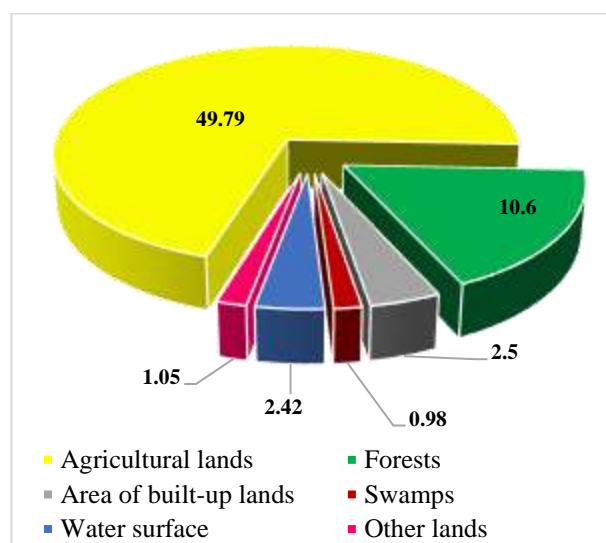


Fig. 1. The land fund of Ukraine structure as of January 1, 2020, million hectares
 Source: Developed based on [29].

According to the analysis results dynamics in the study period (2015–2019), a tendency to reduce agricultural land by 0.4% was revealed. In particular, the area of fallow land decreased by 20.4%, while the area of arable land increased by 0.5% (Table 2).

Table 2. Dynamics of agricultural lands of Ukraine for 2015 – 2019, thousand hectares

Land type	Study period, years					2019 in % to 2015
	2015	2016	2017	2018	2019	
Agricultural lands, total: including	41,511.7	41,507.9	41,504.9	41,489.3	41,329.0	99.6
Arable	32,531.1	32,541.3	32,543.4	32,544.3	32,697.1	100.5
Perennial plantings	892.9	892.4	897.1	894.8	864.4	96.8
Fallowlands	239.4	233.7	230.6	229.3	190.5	79.6
Hayfields	2,407.3	2,406.4	2,402.9	2,399.4	2,294.4	95.3
Pastures	5,441.0	5,434.1	5,430.9	5,421.5	5,282.6	97.1

Source: Generalized based on [29].

It was found that the agricultural land in Ukraine ploughing level in 2015 and in 2019 was 80.5% and 81.2%, respectively, i.e. increased by 0.7%.

According to the study, the highest ploughing level, namely in the range from 70% to 80% in 2019 is observed in four regions of Ukraine – Kirovograd, Mykolaiv, Kherson, Zaporizhia, and the lowest ploughing level, i.e. up to 30% of the territory – in the

Zakarpattia and Ivano-Frankivsk regions (Fig. 2).

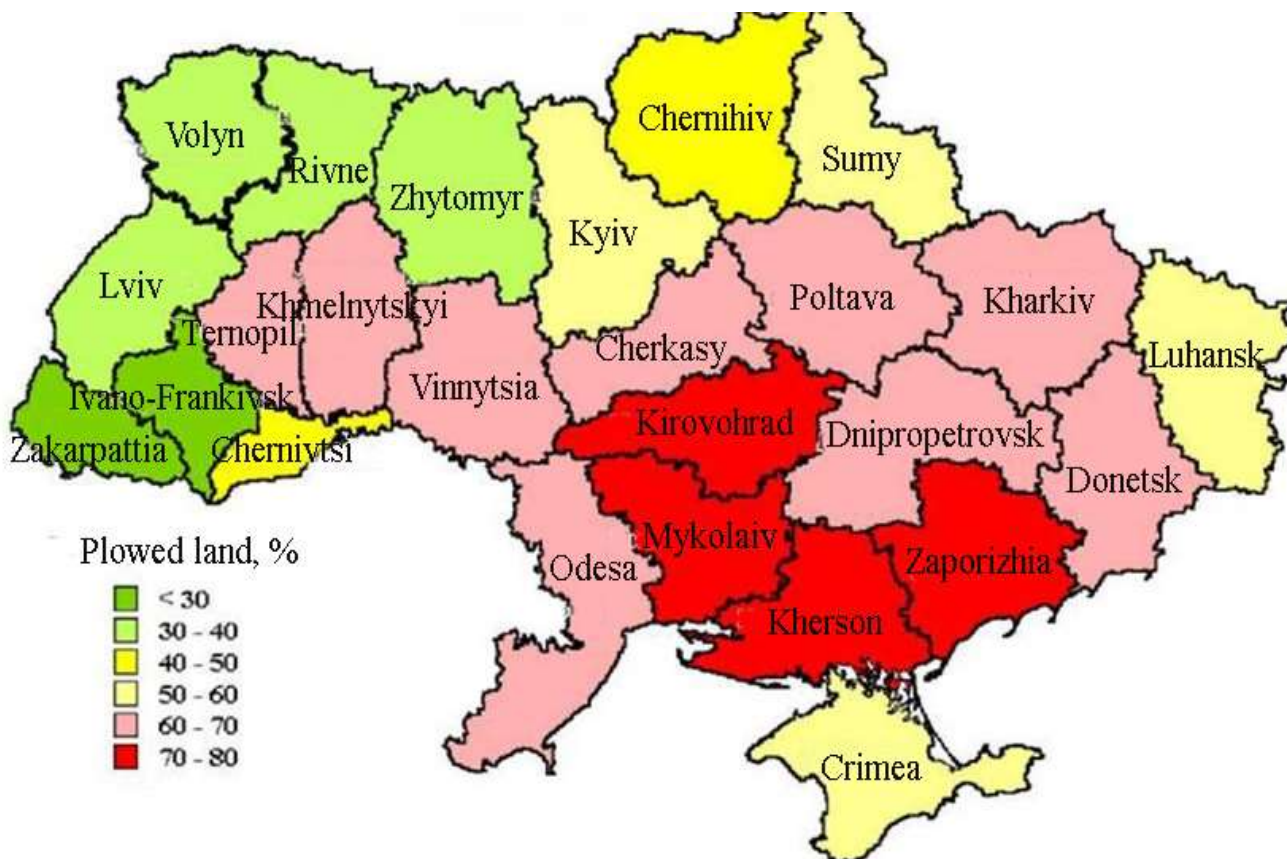


Fig. 2. Cartogram of regions grouping of Ukraine according to the indicator of ploughed agricultural lands, as of 2019.

Source: Developed and systematized based on [29].

As the soils ploughing level in Ukraine has not changed for a long time, soil depletion is growing every year. As a result of the formed culture tendencies which grow on such lands, every year will lose productivity, and consequently, the efficiency of managing the agricultural enterprises systematically decreases.

As of the beginning of 2020, the general ownership structure of the agricultural lands of Ukraine in private hands is concentrated their largest share – 74.95% (Fig. 3).

It should be noted, that in Ukraine is gaining popularity land use type on the rights of emphyteusis, i.e. long-term, alienable and inheritable right to another's property, which is to provide a person with another's land for agricultural purposes in order to obtain fruits and income from it with obligation effectively use it in accordance with the intended purpose.

At the same time, the lease relations between business entities are regulated by the Law of

Ukraine «On Land Lease», which in fact does not set any significant restrictions. This Law stipulates that the lease agreement must specify the leased object, the term of the agreement and the amount of rent, as well as that such an agreement has legal force, it must be notarized.

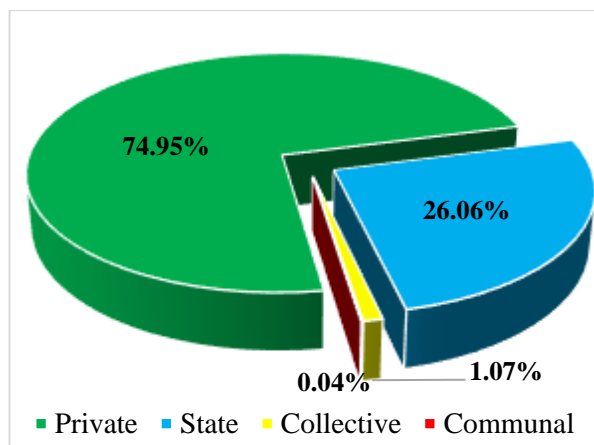


Fig. 3. Ownership structure of agricultural lands in Ukraine as of January 1, 2020, %

Source: Developed based on [29].

There are also deadlines for renting agricultural land, namely the minimum lease term is 7 years, and the maximum – cannot exceed 50 years.

In our opinion, this approach is wrong, because the tenant is not always, or more precisely, almost never worries about the

fertility of the land after the lease. Such mismanagement leads to the loss of the earth's natural fertile properties, which causes total depletion of soils.

We studied the dynamics of the sale of lease rights to state-owned agricultural land in Ukraine for 2015–2019 (Table 3).

Table 3. Lease rights sale dynamics to state-owned agricultural land in Ukraine for 2015 – 2019

Indicators	2015	2016	2017	2018	2019	2019 in % to	
						2015	2018
Area, ha	27,860.09	42,582.39	42,488.26	64,046.77	61,572.62	221.0	96.1
Starting cost of the annual fee, UAH/ha	799.45	1,461.27	1,462.47	1,449.33	1,332.83	166.7	92.0
The cost of the annual fee according to the auction results, UAH/ha	1,377.75	2,249.84	2,793.44	3,431.77	3,431.53	249.1	100.0

Source: Generalized based on [29].

According to Table 3, it is established that for the period of 2015–2019, the area of land plots in respect of which the lease rights sale was carried out increased by 3,712.56 hectares or 121.0%, despite the fact that in 2019 compared to 2018 the volume of such sales decreased by 2,474.15 hectares or by 3.9%. In general, for the analysed period, the starting value of the annual rent increased by 533.38 UAH/ha or 66.7%, and in 2019 compared to 2018 the starting price fell by 166.5 UAH/ha or 8%.

We studied the average rent for the use of agricultural land in Ukraine in terms of its regions as of 2018 (Figs. 4 and 5).

According to the cartogram results analysis (Fig. 4), it is established that the highest level of rent is observed in Cherkasy and Poltava regions, it is slightly lower in Khmelnytskyi and Kharkiv regions. Instead, in most regions of Ukraine, namely – 14 out of 25 the annual rent level is at the lowest value and does not exceed 1,539.7 UAH. Thus, we can conclude that in the current business environment in Ukraine, the amount of rent does not depend on the soil fertility level, because in most western, southern and south-eastern regions of Ukraine, where the most fertile soils are

concentrated, the level of rent is relatively low.

In addition, it should be noted that the agricultural land of public and private ownership renting cost differs significantly from each other, which we found by comparing the data of the cartograms shown in Figs. 4 and 5.

In general, the average annual rent in Ukraine for shares is 1,613.4 UAH/ha, and for state-owned land plots leased at land auctions – 3,431.5 UAH/ha. At the same time, it can be concluded that in general the cost of renting state-owned agricultural land is higher in key regions of Ukraine, similarly to the cost of renting privately owned land. In particular, the amount of annual rent of state lands is highest in Khmelnytskyi, Vinnytsia, Kirovohrad and Poltava regions. At the same time, Khmelnytskyi and Poltava regions are also among the four regions with the highest rents for privately owned land. It was found that the low level of rent for land resources of both private and state ownership is typical for all southern and south-eastern regions except Odessa region, where the cost of renting state-owned land is slightly higher, due to high recreational value and potential of this region of Ukraine.

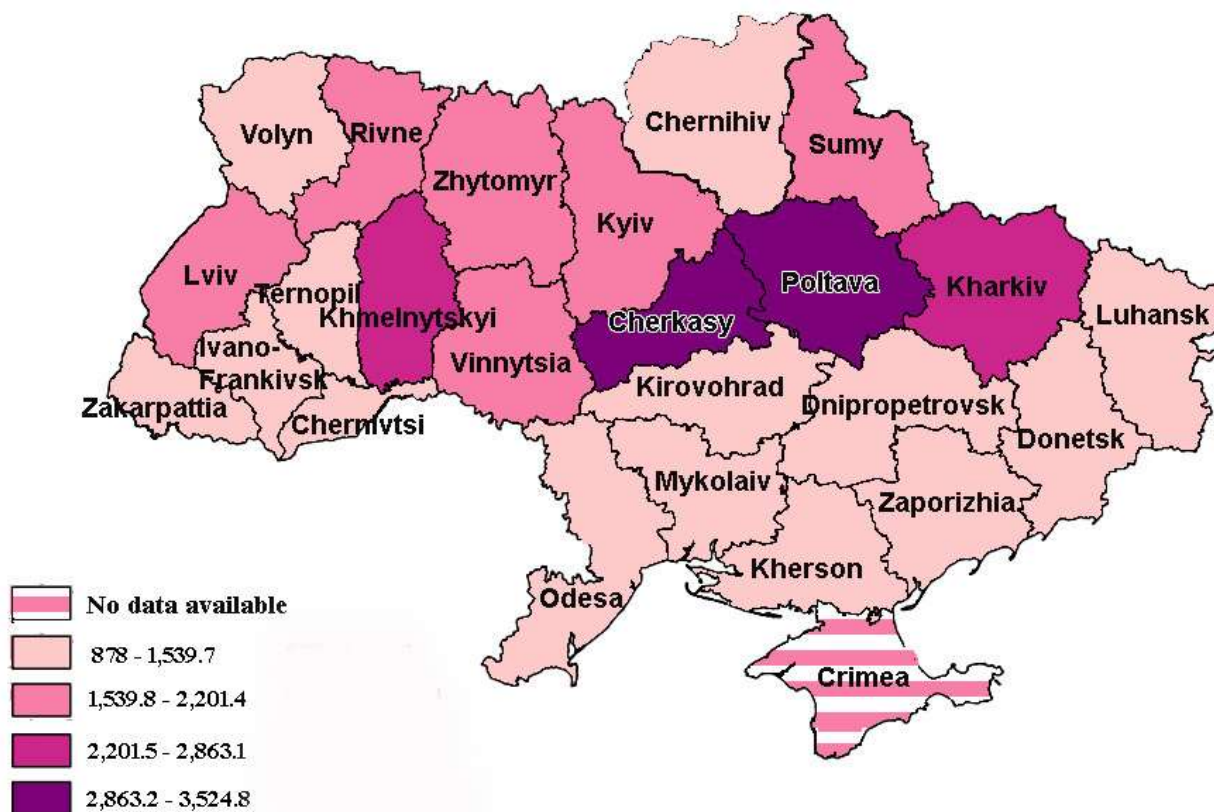


Fig. 4. Cartogram of Ukrainian regions grouping by the average annual rent for the agricultural land use in 2018, UAH/ha

Source: Developed and systematized based on [29].

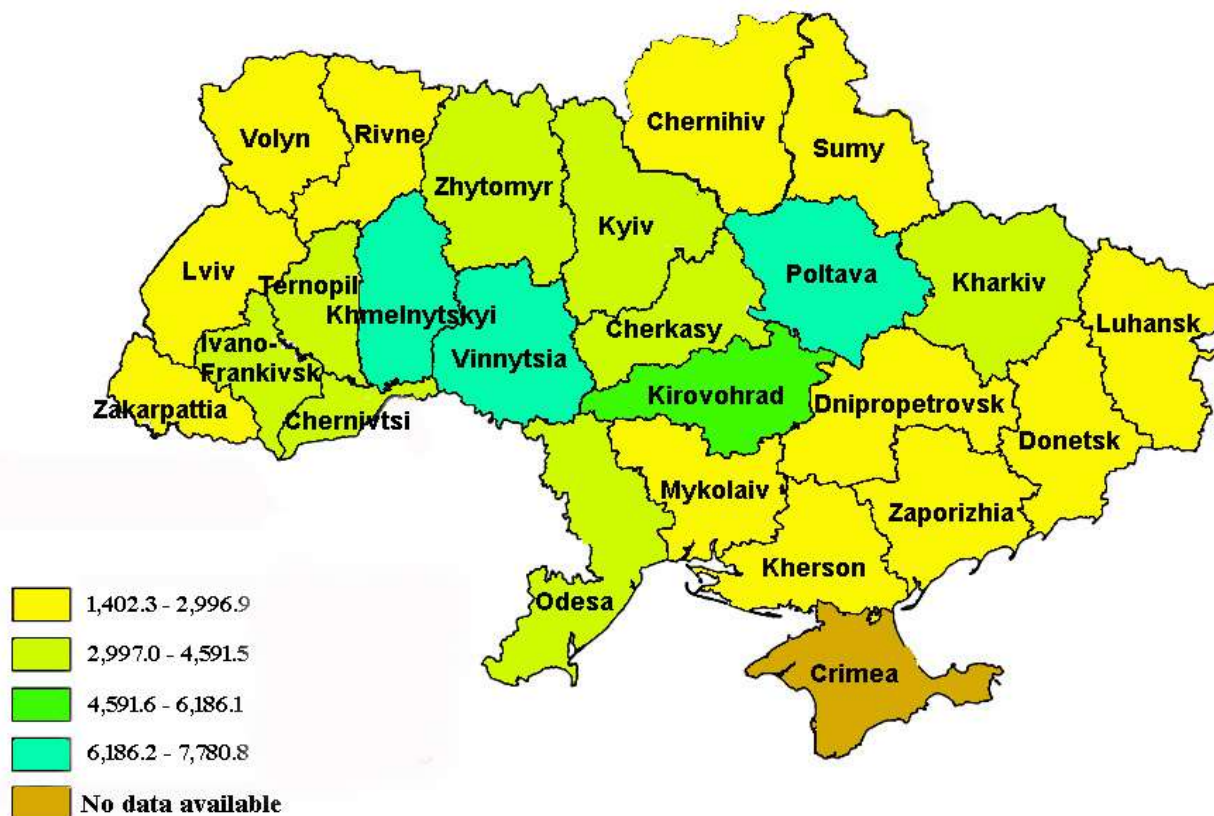


Fig. 5. Cartogram of Ukrainian regions grouping by the average rent amount in 2018 for state-owned agricultural land plots leased at land auctions, UAH/ha

Source: Developed and systematized based on [29].

As is known, until March 31, 2020 in Ukraine there was a moratorium on the sale of agricultural land. However, the Verkhovna Rada of Ukraine later adopted the Law of Ukraine “On Amendments to Certain Legislative Acts of Ukraine on the Conditions of Circulation of Agricultural Land” [13], which defined the peculiarities of the regulatory requirements formation for the organization of the agricultural land market. Thus, it allowed providing conditions for the effective formation of transparent market conditions of purchase and sale and the final acquisition of ownership of agricultural land by citizens of Ukraine. Peculiarities of application of this law determine that the right of agricultural land ownership with an area up to 100 hectares can be acquired only by citizens of Ukraine. Also, from January 1, 2024, such a right will be granted to resident legal entities with an increase in the area of land that can be acquired in the ownership up to 10 thousand hectares.

In our opinion, the specifics of the agricultural land market functioning for legal entities becomes especially relevant in terms of expanding opportunities to attract investors in the agroindustry sector. After all, access to land ownership will result in an increase in the land fund of agricultural enterprises and agricultural holdings and expand their opportunities for planning seasonal changes in sown areas. Accordingly, such planned changes in crops on agricultural lands will result in an overall increase in the efficiency of agricultural land use.

Ukrainian lands are quite fertile and rich in chernozems, which is another important factor that the effectiveness of their use in the case of successful management decisions can reach a sufficient level (Fig. 6).

Thus, the land bank of chernozems of Ukraine is 28 million hectares, which is 28 times more than in Germany and Poland. The area of Ukrainian soils is 60 million hectares, which is 37 million hectares more than in Romania, 29 million hectares more than in Poland and 25 million hectares more than in Germany. The situation is similar with arable land reserves, the volume of which in Ukraine is

32 million hectares, while in Poland this figure is lower by 71.9%, in Germany – by 62.5%, in Romania – by 56.3%. All this is evidence of significant untapped potential and realization of possible prospects for land market development in Ukraine, as the presence of a significant amount of fertile land is the basis for increasing investment in agroindustry sector with increasing efficiency in both short and long term. Such a generous land fund of Ukraine allows them to grow and produce agricultural products in sufficient quantities and at a high-quality level. However, this is only theoretical, but in practice, the situation is somewhat different.

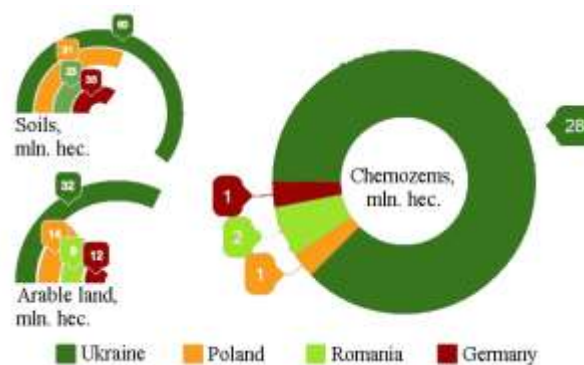


Fig. 6. Reserves of chernozem, soil and arable land in Ukraine, Poland, Romania and Germany, in million hectares, as of 2018 year

Source: Generalized and systematized based on [29].

Having significant and high-quality reserves of fertile lands, Ukraine is 2–3 times less productive than developed countries, which is evidence of inefficient use of agricultural land by agricultural enterprises of Ukraine.

According to Table 4, it is established that the sown and harvested areas in the period 2015–2019 in Ukraine decreased in all types of products, except cereals and legumes and sunflower, given that these crops are very depleting even for Ukrainian chernozems.

The increase in the area sown with industrial crops indicates the desire of their owners to get very high profits, because the profitability of sunflower, soybean, rape is higher than the profitability of wheat, which ultimately leads to agricultural land depletion, and the cost of their restoration is sometimes incomparable.

Table 4. Major crops areas and production dynamics by agricultural enterprises of Ukraine in 2015 – 2019

Product	Years					2019 in % to	
	2015	2016	2017	2018	2019	2015	2018
Sowing area. thousand hectares							
Cereals and legumes	10,719.4	10,461.6	10,573.1	10,785.9	11,202.3	104.5	103.9
Sugar beet factory	213.5	271.5	296.6	258.2	206.0	96.5	79.8
Sunflower	4,155.2	4,981.4	4,980.6	5,068.7	4,855.6	116.9	95.8
Potato	23.0	22.4	18.8	16.2	15.9	68.7	98.8
Vegetable crops	35.8	35.5	30.7	31.6	34.7	96.9	109.8
Fruit and berry crops	74.8	66.6	67.0	68.9	65.9	88.1	95.6
Collected area. thousand hectares							
Cereals and legumes	10,622.9	10,397.6	10,509.7	10,740.6	11,176.1	105.2	104.1
Sugar beet factory	213.1	270.2	294.1	256.7	205.4	96.4	80.0
Sunflower	4,092.6	4,968.1	4,953.6	5,019.3	4,824.3	117.9	96.1
Potato	23.0	21.8	17.8	16.0	15.8	69.1	98.1
Vegetable crops	35.3	34.3	30.6	31.3	34.0	96.3	108.6
Fruit and berry crops	58.2	51.0	51.4	52.2	47.7	82.0	91.4
Production volume. thousand quintals							
Cereals and legumes	465,065.8	520,222.5	479,050.9	560,961.9	599,820.8	129.0	106.9
Sugar beet factory	95,537.6	133,488.6	142,271.8	133,166.3	96,583.1	101.1	72.5
Sunflower	95,492.5	117,300.5	105,967.3	121,935.8	130,886.5	137.1	107.3
Potato	4,559.6	4,681.6	4,294.1	4,163.5	3,734.3	81.9	89.7
Vegetable crops	12,817.0	13,229.3	13,439.3	13,571.1	14,208.5	110.9	104.7
Fruit and berry crops	4,116.8	3,705.4	3,337.7	5,566.1	3,510.5	85.3	63.1
Yield from 1 ha. quintals							
Cereals and legumes	43.8	50.0	45.6	52.2	53.7	122.6	102.9
Sugar beet factory	488.2	494.0	484.1	518.8	470.3	96.3	90.7
Sunflower	23.0	23.5	21.3	24.1	27.0	117.4	112.0
Potato	198.6	212.1	238.4	252.0	230.5	116.1	91.5
Vegetable crops	363.4	382.7	435.3	427.4	415.8	114.4	97.3
Fruit and berry crops	70.8	72.5	64.9	106.2	72.7	102.7	68.5

Source: Generalized and systematized based on [30].

In addition, the analysis data show a constant increase during the analysed period in the volume of agricultural production, except for potatoes and fruits, and berries. This is due to the gradual opening of the European market for Ukrainian producers.

According to the results presented in Table 4, we found the difference between the sown area and the area from which the crop was harvested. It is obvious that the harvested area is smaller than the sown area, which is evidence that agricultural producers have lost some of their products due to the reduction of the harvested area of their land.

In addition, an important element of the land–use efficiency analysis in agricultural production is to take into account the number of crop losses by agricultural enterprises that arose as a result of the difference between sown and harvested agricultural land (Table 5).

In particular, according to Table. 5, we found that the lowest yield losses during the study period are observed for cereals, legumes, and beets, namely – only 0.2% of total production (in 2017 and 2015, respectively). In particular, the largest losses for beets were only – 0.9% of total production (in 2015 and 2017, respectively). At the same time, the most significant yield losses of agricultural producers in the study period are observed for fruit and berry crops, where the lowest loss rate was 28.5% of total production in 2015, and the highest loss rate – 37.7% of total production was observed in 2019. Thus, according to the results of the study in 2015 – 2019, it was found that the difference between sown in the harvested area most significantly affected the yield of fruit and berry crops in agricultural producers of Ukraine.

Table 5. Yield losses of the main agricultural crops by agricultural enterprises of Ukraine in 2015–2019

Product	2015	2016	2017	2018	2019
Yield losses, thousand quintals					
Cereals and legumes	4,226.7	3,200.0	2,891.0	2,364.7	1,406.9
Sugar beet factory	195.3	642.2	1,210.3	778.2	282.2
Sunflower	–	127.3	–	–	–
Potato	181.7	459.2	43.5	128.2	291.1
Vegetable crops	1,175.3	1,131.0	1,012.4	1,773.5	1,323.1
Yield losses in% of total production					
Cereals and legumes	0.9	0.6	0.6	0.4	0.2
Sugar beet factory	0.2	0.5	0.9	0.6	0.3
Sunflower	–	2.7	–	–	–
Potato	1.4	3.5	0.3	0.9	2.0
Vegetable crops	28.5	30.5	30.3	31.9	37.7

Source: Generalized and systematized based on [30].

Table 6. The analysis results of the factors impact on the sales dynamics of gross output of agricultural producers of Ukraine for 2014 – 2018 by factor analysis of the assets return of their fixed assets

Researched indicators	The study period			Deviation				Quantitative influence of factors on the performance indicator, UAH million	
	2014	2017	2018	absolute		relative, %		2017 – 2018	2014 – 2018
				2018 – 2014	2018 – 2017	2018 – 2014	2018 – 2017		
Sales of gross output, UAH million	214,972.5	452,760.1	528,657.8	313,685.3	75,897.7	145.9	16.8	X	X
Fixed assets, UAH million	171,392.0	341,622.0	407,146.0	235,754.0	65,524.0	137.6	19.2	86,830.5	295,710.7
Return on assets, thousand UAH	1,254.3	1,325.3	1,298.4	44.1	–26.9	3.5	–2.0	–10,932.8	17,974.6

Source: Generalized and systematized based on [30].

We systematized the results of the impact factors assessing on the sale of gross output of agricultural enterprises of Ukraine in 2014 – 2018 by analysing the dynamics of the return rate on their fixed assets and the factors that influenced its formation (Table 6). The results of the factor analysis will make it possible to identify the quantitative impact of factors on the efficiency of non-current assets of agricultural producers, the lion's share of which is directly occupied by land resources. Thus, according to the factor analysis results by the elimination method (Table 6), we found that in 2014 - 2018, the growth of sales by agricultural producers gross output by 145.9% (or 313,685.3 million UAH) was influenced by rising costs fixed assets by 137.6%, which led to an increase in the performance indicator by 295,710.7 million UAH. At the same time, the growth of the return on non-current assets for 2014 - 2018

by 3.5% led to an increase in the performance indicator by 17,974.6 million UAH. Thus, a more significant impact on the sale of gross output by agricultural producers of Ukraine in the study period has a value of their fixed assets, a significant share of which is land resources.

In 2017 - 2018, the growth of the gross sales of agricultural producers by 16.8% (or 75,897.7 million UAH) was influenced by the growth of the value of fixed assets by 19.2%, which led to an increase in the performance indicator by 86,830.5 million UAH. As a result of the study, it was found that the decrease in the return on non-current assets for 2017 - 2018 by 2.0% led to a decrease in the performance indicator by 10,932.8 million UAH.

We systematized the results of assessing the impact of factors on the return on assets of agricultural producers of Ukraine for 2014 -

2018 by identifying the factors that influenced its formation by determining their quantitative impact through factor analysis methods, including the method of elimination (Table 7).

Table 7. The analysing results of the factors impact on the dynamics of assets return of agricultural producers of Ukraine for 2014 – 2018 by conducting a factor analysis by the method of elimination

Researched indicators	The study period			Deviation				Quantitative influence of factors on the performance indicator, %	
	2014	2017	2018	absolute		relative, %		2017 – 2018	2014 – 2018
				2018 – 2014	2018 – 2017	2018 – 2014	2018 – 2017		
Fixed assets, million UAH	171,392.0	341,622.0	407,146.0	235,754.0	65,524.0	137.6	19.2	-3.345	-23.988
Profit, million UAH	21,481.3	68,858.5	71,002.6	49,521.3	2,144.1	230.5	3.1	0.628	28.894
Return on assets, %	12.533	20.156	17.439	4.906	-2.717	X	X	X	X

Spource: Generalized and systematized based on [30].

Thus, according to the factor analysis results by the elimination method (Table 7) we found that in 2014 - 2018 the dynamics of the return on assets of agricultural producers of Ukraine was affected by an increase in the value of fixed assets (including land resources) by 137.6%, which led to a decrease in performance by 23.9%. At the same time, the increase in the profit of agricultural producers of Ukraine for 2014 – 2018 by 230.5% led to an increase in the return on their assets by 28.8%. As a result, under the influence of all factors for 2014 – 2018, the return on assets of agricultural producers in Ukraine increased by 4.9%.

It is established that in 2017 – 2018, the increase in the value of fixed assets (including land resources) by 19.2% led to a decrease in the return on assets of agricultural producers of Ukraine by 3.34%. At the same time, the increase in the profit of agricultural producers of Ukraine for 2017 – 2018 by 3.1% (i.e. by UAH 2,144.1 million) led to an increase in the return on their assets by only 0.62%. As a result, due to the combination of all factors for 2017 – 2018, the return on assets of agricultural producers in Ukraine decreased by 2.72%.

CONCLUSIONS

According to the study results, it is established that the land resources use by agricultural enterprises of Ukraine is not

efficient enough. This is confirmed by the yield loss, as the harvested area for individual crops is significantly smaller than sown. That is, due to a number of reasons related to poor management (flooding, drought, significant frosts, poor pest control) could not be harvested on certain lands.

Summarizing the work results, it is possible to form the main directions and reasons for the reduction of soil fertility and the land fund of Ukraine inefficient use:

- 1.increase in the volume of agricultural land allocated for technical and oilseeds;
- 2.impossibility of agricultural lands free circulation;
- 3.the land lease market insufficient development due to the ineffectiveness of the levers for its regulation, which leads to mismanagement of tenant companies;
4. low level of land reclamation and constant level of ploughing of soils lead to catastrophic depletion and loss of fertility of agricultural areas.

These problematic aspects are certainly signing of agricultural land use insufficient efficiency by agricultural producers in Ukraine.

In our opinion, the main task of the state to rationalize and establish the efficient use of land resources in the agricultural sector is to introduce a number of measures to ensure efficient land use, namely:

- creation of a mechanism for preferential financing of the process of reconstruction of

old and construction of new, technically advanced irrigation and drainage systems. Whereas the study has shown that Ukrainian farmers lose their crops due to the impossibility of harvesting from the entire sown area, and modern irrigation and drainage mechanisms will greatly help to avoid such problems in the future;

– improving the economic mechanism of management, which will ensure the implementation of measures to protect natural resources and preserve soil fertility in Ukraine, because in terms of maximizing the profitability of farmers often neglects the issue of rationalization and feasibility of growing certain crops in terms of preserving other useful properties. appointment.

No less important are the state actions in the land regulation legal aspect. The main thing here is to improve land legislation, introduce an efficient and transparent land circulation market, and ensure control over the land resources targeted use by agricultural economic entities.

We believe that the implementation of the proposed measures will provide the prerequisites for the land-use efficient mechanism implementation, which will have a positive impact on the economic situation in agricultural production and the economy as a whole. In our opinion, the successful continuation of the outlined measures set will help increase the efficiency of land use in Ukraine, which will ensure the entry of agricultural production to a new quality level.

REFERENCES

- [1]Andriychuk, V. Economics of agricultural enterprises. Kyiv: KNEU, 624 p.
- [2]Andriychuk, V., 2006, The efficiency of agricultural enterprises: theory, methodology, analysis. Kyiv: KNEU, 292 p.
- [3]Boiar, A., O., Shmatkovska, T. O., Stashchuk, O. V., 2018, Towards the theory of supranational finance. Cogent Business & Management. 5(1). <http://doi.org/10.1080/23311975.2018.1482594>. Accessed on May. 26, 2020.
- [4]Cherevko, G., Ivanytska, G., 2001, AIC: assessment of reform and development prospects. Bulletin of Agricultural Science, 14 (1): 14–19.
- [5]Chernetska, O., 2011, Methodical approaches to determining the cost effectiveness of agricultural enterprises in management accounting. Actual problems of economic development of the region, 7 (1): 188–195.
- [6]Demianenko, S., 2005, Management of agricultural enterprises. Kyiv: KNEU, 347 p.
- [7]Dobrovolska, N., 2013, On the issue of determining the ecological and economic efficiency of land use in agriculture. Region-2013: strategy of optimal development: materials of the International scientific-practical conference: 407–409.
- [8]Dziamulych, M., Sadovska, I., Shmatkovska, T., Nahirska K., Nuzhna O., Gavryliuk O., 2020, The study of the relationship between rural population spending on peasant households with the main socio-economic indicators: a case study of Volyn region, Ukraine. Scientific Papers: Series «Management, Economic Engineering in Agriculture and rural development», Vol. 20(2):217–222. http://managementjournal.usamv.ro/pdf/vol.20_2/volume_20_2_2020.pdf, Accessed on June. 27, 2020.
- [9]Dziamulych, M., Shmatkovska, T., Gordiichuk, A., Kupyra, M., Korobchuk, T., 2020, Estimating peasant farms income and the standard of living of a rural population based on multi-factorial econometric modeling: a case study of Ukraine. Scientific Papers: Series «Management, Economic Engineering in Agriculture and rural development», Vol. 20(1): 199–206, http://managementjournal.usamv.ro/pdf/vol.20_1/Art27.pdf Accessed on May. 26, 2020.
- [10]Hordienko, V., 2010, Ecological and economic efficiency of agricultural land use: Ph. D. Dis. special. "Economics of nature". Sumy: Sumy State University. 241 p.
- [11]Hutorov, O., 2006, Estimation of land resources and efficiency of investments. Kharkiv: Kharkiv National Agrarian University, 368 p.
- [12]Lavruk, V., 2010, Methods of evaluating the effectiveness and analysis of innovation in agriculture. Efficient economy, Vol. 4. http://irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/efek_2010_4_19.pdf. Accessed on Jul. 01, 2020.
- [13]Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Concerning the Conditions of Circulation of Agricultural Lands" № 552-IX of March 31, 2020. <https://www.rada.gov.ua/news/actual/191679.html>, Accessed on Apr. 18, 2020.
- [14]Mochernyi, S., 2000, Economic Encyclopedia: in 3 volumes. Kyiv: Academy. Vol. 1. 864 p.
- [15]Musyka, P. M., Urba, S .I., Goncharenko, L. V., 2019, Analysis of the state and efficiency of land use in Ukraine. Scientific notes of Tavria National University named after V. I. Vernadsky. Series: Economics and Management, Vol 30 (62), Iss. 4(2): 45–53.
- [16]Popescu Agatha, Caraba-Meita Nela-Loredana, 2020, Elasticity of production in Romania's agriculture – a territorial approach by micro-region, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 20(1): 489 – 503.

- [17]Popescu Agatha, Dinu Toma Adrian, Stoian Elena, 2018, Demographic and economic changes characterizing the rural population in Romania, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development* Vol. 18(2): 333 – 346.
- [18]Popescu, A., 2013, Considerations on utilized agricultural land and farm structure in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol.13(4): 221-226.
- [19]Popescu, A., Matei, A., 2008, Researches concerning the feasibility of Production Integration Management in a family sericultural farm, *Bulletin USAMV Cluj-Napoca, Horticulture*, Vol.65 (2): 302-307.
- [20]Popescu, A., Dinu, T. A., Stoian, E., 2019, Efficiency of the agricultural land use in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development* Vol. 19(3): 475–486.
- [21]Popescu, A., Alecu, I.N., Dinu, T.A., Stoian, E., Condei, R., Ciocan, H., 2016, Trends in farm structure and land concentration in Romania and the European Union's Agriculture, *Procedia Agriculture, Agriculture and Agricultural Science Procedia*, Vol. 10: 566–577.
- [22]Popescu, A., 2013, Considerations on the main features of the agricultural population in the European Union, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 13(4): 213-220.
- [23]Popescu, A., 2015a, Analysis of the dynamics of Gross Domestic Product and of its main factors of influence in Romania's agriculture, *Proceedings of 25th IBIMA Conference Innovation Vision 2020: from Regional Development Sustainability to Global Economic Growth*, Amsterdam, The Netherlands, May 7-8, 2015, pp.1379-1393.
- [24]Popescu, A., 2015b, Research on labour productivity in Romania's agriculture, *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, Vol. 15(2): 271-280.
- [25]Popescu, M., 2010, Physical Size of Agricultural Holdings in Romania. Gaps between Romania and the European Union Member States. Institute of Agricultural Economics, Romanian Academy. *Agricultural Economics and Rural Development*, New Series, Year VII, no. 1: 17–36.
- [26]Shmatkovska, T., Dziamulych, M., Gordiichuk, A., Mostovenko, N., Chyzh, N., Korobchuk, T. 2020, Trends in human capital formation and evaluation of the interconnection of socio-demographic processes in rural area: a case study of Volyn region, Ukraine. *Scientific Papers: Series «Management, Economic Engineering in Agriculture and rural development»*, Vol. 20(2): 437–444. http://managementjournal.usamv.ro/pdf/vol.20_2/volume_20_2_2020.pdf Accessed on June. 27, 2020.
- [27]Smagin, I., 2002, On the question of the method of determining the integrated indicator of the efficiency of agricultural production. *Economics of agricultural and processing enterprises*, 7: 18–20.
- [28]Sodoma, R., Skhidnytska, H., Shvorak, A., Shmatkovska, T., Zhurakovska, I., 2018, Peculiarities of agrarian receipts as a modern financial tool. *Economic annals – XXI*, 169 (1-2): 46-49. <https://doi.org/10.21003/ea.V169-09>, Accessed on May. 26, 2020.
- [29]State Service of Ukraine for Geodesy, Cartography and Cadastre. <https://land.gov.ua>, Accessed on Jul. 01, 2020.
- [30]State Statistics Service of Ukraine. <http://www.ukrstat.gov.ua>, Accessed on Jul. 01, 2020.
- [31]Tofan, I. N., Ahres, O. H., Shmatkovska, T. O., 2017, Problems in administration of real estate tax other than land in Ukraine. *Scientific Bulletin of Polissia*, 3 (11): 148-153. <http://nvp.stu.cn.ua/uk/component/k2/item/823-tofan-i-n-ahres-o-h-shmatkovska-t-o-problems-in-administration-of-tax-on-real-estate-other-than-land-in-ukraine.html>, Accessed on May. 26, 2020.
- [32]Shulyk, Y.V., Tsymbaliuk, I. O., Shmatkovska, T. O., 2017, Tax alternatives to implement the tax capacity of internet activity in Ukraine. *Financial and credit activity: problems of theory and practice*. Kharkiv, 22: 336-344. <http://fkd.org.ua/article/view/110049>, Accessed on Apr. 18, 2020.
- [33]Vasylykov, V., 2003, Organization of production. Kyiv: KNEU, 524 p.
- [34]Yakubiv, V., Boryshkevych, I., Yakubiv, R., 2019, Balanced system of economic performances as a strategy forming tool of development of agricultural enterprises in Ukraine. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development* Vol. 19(3): 669-680.
- [35]Yakubiv, V., Polujk, M., 2019, Innovative methodologies for estimating the personnel of agricultural enterprises in Ukraine. *Scientific Papers. Series «Management, Economic Engineering in Agriculture and Rural Development»*, Vol. 19(1) Retrieved from: http://managementjournal.usamv.ro/pdf/vol.19_1/volume_19_1_2019.pdf, Accessed on Apr. 22, 2020.
- [36]Yakubiv, V., Sodoma R., Hrytsyna, O., Pavlikha, N., Shmatkovska, T., Tsymbaliuk, I., Marcus, O., Brodska, I., 2019, Development of electronic banking: a case study of Ukraine. *Entrepreneurship and Sustainability Issues*, 7(1): 219-232. [http://doi.org/10.9770/jesi.2019.7.1\(17\)](http://doi.org/10.9770/jesi.2019.7.1(17)), Accessed on Apr. 18, 2020.
- [37]Zhurakovska, I. V., Sydorenko, R. V., Shmatkovska, T. O., Brodska, I. I., 2020, Factors of influence on employment in small and medium-sized business in Ukraine. *Financial and credit activity: problems of theory and practice*. Vol 1, 32: 109–119. <http://fkd.org.ua/article/view/200379/200860>, Accessed on Apr. 18, 2020.