DETERMINATION OF THE POTENTIAL OPPORTUNITIES FOR THE FOOD PROVISION WITH GRAIN PRODUCTION: UKRAINIAN AND EUROPEAN VIEWPOINT

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Abstract. The purpose of the paper is to determine the potential of the food provision of the Sumy region The agricultural production in the region is not just a complex of the industries, developing independently from each other, but the rational and systematic combination of all elements and factors of production under certain specific natural and economic conditions, the interrelated development of various branches of agriculture, first and foremost, the rational combination of scientifically grounded systems of farming and livestock, the optimal combination of which lies in their rational interconnection. What is important to notice is that between the volumes of agricultural production and food consumption in the agro-industrial countries, there is a direct relationship with the total amount of consumption, because the manufacturers of this production and most of its consumers are the same individuals. Along with this, the main problems which may occur in the growth of production volume in the agri-food complex of the transition economy could be: the low purchasing power of population and insufficient level of the development of product promotion infrastructure. Having regard to the principles of agricultural location, and in view of a range of the above problems, in our opinion, it stands to reason that the

issue of the region self-provision with the main types of production, which should be affordable to the average consumer, i.e. be solvent in effective demand, is the most pressing. It is essential to put emphasis on the fact that the theoretical and practical aspects of the formation of the regional food policy and the market strategy of their development, the motivational potential of their existence in the market economy environment require further research.

Methodology of the study. When conducting this research, we used the statistical records of Sumy Region for the last 3 yearsand the statistical records of EU-28 for the last year (DerzhavnyikomitetstatystykyUkrainy. Holovneupravlinniastatystyky v Sumskiioblasti, 2016, SilskehospodarstvoUkrainy u 2016rotsi, 2017, Agricultural statistics of EU-28, 2017). The regression and index analyses for the development and calculation of the integrated factor of agricultural land adjustment have been used as well.

Results. After conducting the research, we have determined that the solution to the problem of food provision of Ukraine and Sumy Region and of EU-28 and Estonia, Latvia, Lithuania, in particular, is to increase the efficiency of agricultural landuse. Taking the above mentioned into consideration, we consider it appropriate to transfer unused arable land to the full-fledged private and owner-operated farms, and private households. However, the large agricultural enterprises in the coming years should seek to play a more significant role in addressing the problems of food provision of the region, especially in grain crop.

Practical use. The results of the conducted research will help reallocate land plots among agricultural enterprises of different forms of ownership for their more efficient use and improve food security in the regionafter the proper implementation of the land reforms. In view of the foregoing, there is a need for the state regulation of the grain market and support for grain sales prices. This necessitates the objective assessment of the potential opportunities on the region scale for Ukraine and Europe.

Key words: potential gross yield, opportunities, resource factors, agricultural land adjustment, food provision.

1. Introduction

The agricultural production in the region is not just a complex of the industries, developing independently from each other, but the rational and systematic combination of all elements and factors of production under certain specific natural and economic conditions, the interrelated development of various branches of agriculture, first and foremost, the rational combination of scientifically grounded systems of farming and livestock, the optimal combination of which lies in their rational interconnection.

This combination of industries is based on the rational use of land as the main means of production in agriculture, which requires the monoculture exclusion, and the optimal system of crop rotation. However, the full employment of labor with the consideration of the seasonality of agricultural production requires the combination of crop cultivation with the development of livestock industries and industrial sectors of the agricultural formations.

The economic basis of such labor division determines the efficiency of the location of agricultural production on the territory of the country or region in accordance with the principles of food security. In the Decree of the Cabinet of Ministers of Ukraine "On Principle of the Location of Competitive Agricultural Production by Natural-Economic Zones, Depending on Market Conditions", these principles are divided into priority and specific.

What is important to notice is that between the volumes of agricultural products and food consumption in the agro-industrial countries, there is a direct relationship with the total amount of consumption, because the manufacturers of these products and most of their consumers are the same individuals. Along with this, the main problems which may occur in the growth of production volume in the agri-food complex of the transition economy could be: the low purchasing power of population and insufficient level of the development of product promotion infrastructure.

Having regard to the principles of agricultural location, and in view of a range of the above problems, in our opinion, it stands to reason that the issue of the region self-provision with the main types of products, which should be affordable to an average consumer, i.e. be solvent in effective demand, is the most pressing one.

It is essential to put emphasis on the fact that the theoretical and practical aspects of the formation of the regional food policy and the market strategy of their development, the motivational potential of their existence in the market economy environment require further research. The above aspects are to some extent reflected in the scientific works of V. Balabanov, V. Boiko, Yu. Kovalenko, P. Loiko, V. Mykytiuk, G. Palamarchuk, Yu. Parkhomova, G. Pidlisetskyi, P. Sabluk and others.

The majority of authors, such as V. Bytov, K. Kozak, L. Stashynska, V. Proskura, Ye. Grygoriev, O. Shevchenko, O. Shapovalova and others, agree that the government should develop the effective doctrine of food security as a component of the national security.

In view of the foregoing, we believe that food security of the region is one of the main tasks in improving the national development sustainability for the near future. The above reasonings are the convincing argument of expediency of strengthening the influence of state regulation of the process of manufacture of food products, especially in terms of the region self-provision. Against this background, the issue of the development of methodical bases of determining the potential opportunities of the region for manufacture of agricultural products, in particular, grain, is of relevance.

The main directions of improving the food security of the Ukrainian regions include:

- intensive development and increased competitiveness of agro-industrial complex against import on the basis of the integrated assessment of the natural and climatic, and production potential of the region;

- increase in real income of the population, especially its socially vulnerable groups on the basis of proficiency, employment and labor productivity enhancement, as well

as the targeted provision of social institutions, educational institutions, low-income families;

- promotion of export of food products with high added value rather than raw materials to be processed in Ukraine, the widespread use of the non-tariff methods of import regulation;

- state support of prices for agricultural products through the establishment of reserve funds, subsidies for the infrastructure development and crediting of agricultural enterprises, the compensation of the disparity of prices for agricultural products and resources for their manufacture;

- development of regional clusters in food production;

- creation of the national system of information on the condition of regional and external food markets (Kozak, 2014).

2. Analysis of agricultural market of Sumy Region

Sumy Region geographically covers two natural zones – Forest-Steppe and Polissia that determines the specialization and location of its agricultural production. The natural and climatic conditions are sufficiently favorable for the successful cultivation of raw material of the main agricultural food products.

Certain specified criteria of the optimal manufacture of the main types of agricultural products do not exist, with the exception of grain, the optimal amount of which in the region is 1,000 kg per capita (taking into account the needs of the livestock industry). According to the research results, the manufacture of the main agricultural products per capita per almost each product name annually tends to increase in Sumy Region (Table 1).

A more detailed analysis of the production output of the types of products listed in Table 1 has made it possible to reveal the general trend over the last six years. The positive growth rate, except for sugar beet and potato, the gross yields of which per capita have decreased annually by 111.0 centners or 39.0% and 5.0 centners or 0.5%, respectively. The production of sunflower and grain crops has increased most significantly. The average annual increase of the above crops in

relative measurement accounts for 14.9% and 10.4%. The production of vegetables, meat and eggs has annually increased approximately with the same intensity (from 2.2% to 2.9%). The slightest average annual growth characterizes the intensity of milk production, and accounts for only 0.2% annually.

Table 1

Production of the main types of agricultural food products per capita in Sumy Region, center

Product	2012	2013	2014	2015	2016	The average annual growth (+/-), center	Average annual growth rate,%
Corn	2323.3	3152.7	3492.8	3339.3	3448.0	281.2	110.4
Sugar beets	515.5	27.2	68.4	66.7	71.5	-111.0	61.0
Sunflower	253.2	368.1	375.7	421.4	441.3	47.0	114.9
Potato	982.8	959.4	1175.7	955.3	962.9	-5.0	99.5
Vegetables	161.4	166.4	172.2	169.1	181.1	4.9	102.2
Meat (in slaughter weight)	55.0	37.1	39.9	39.2	61.6	1.7	102.9
Milk	372.1	375.5	378.6	373.4	374.6	0.4	100.2
Eggs, pcs.	328.9	373.8	391.2	371.5	362.0	8.3	102.4

The solution of the food problem in Ukraine depends primarily on the efficiency of grain production, the level of the development of which largely determines the socio-political and economic stability in the country, its food security. One can judge the level of the grain production development not only by the economic performance of the agro-industrial complex and its sectors, but also by the might of the state itself (Ambrosov, Sabluk, 2000).

3. Analysis of agricultural market of European Union

The structure of agriculture in the Member States of the European Union (EU) varies as a function of differences in geology, topography, climate and natural resources, as well as the diversity of regional activities, infrastructure and social customs.

Traditionally, agriculture in the EU is divided into crop and livestock production.

The range and variety of crops grown across the European Union (EU) reflects their heritable traits as well as the ability of plant breeders to harness those traits to best respond to the myriad of topographic and climatic conditions, pests and diseases.

The statistics on crop production in Estonia, Latvia and Lithuania are shown in the table 2 (Agricultural statistics of EU-28, 2017).

Table 2

Crop production, 2016

Product	EU-28, housandtonnes	Estonia		Latvia		Lithuania	
		housandtonnes	percent	housandtonnes	percent	housandtonnes	percent
Cereals	301357.9	934.1	0.310	2703.2	0.897	5120.82	1.699
Potatoes	55969.8	62.91	0.112	203.6	0.364	344.78	0.616
Tomatoes	17956.31	0.36	0.002	5.8	0.032	11.4	0.063
Carrots	5593.57	11.14	0.199	14.8	0.265	43.02	0.769
Onions	6577.92	0.06	0.001	5.2	0.079	25.01	0.380
Apples	12568.46	2.77	0.022	9.8	0.078	57.52	0.458

In 2016, the harvest of crops in the EU decreased by about 4.4 % compared to the previous year, which was largely explained by unfavourable climatic conditions.

From Estonia, Latvia and Lithuania in 2016 came less than 1 percent of every type of production. Estonia, Latvia and Lithuania do not grow peaches, oranges and sugar beet.

The economic relevance of animal production in agricultural accounts is underlined by the fact that it accounts for 43.1 % (EUR 167 billion) of the total EU-28 agricultural output. Animal production covers two items: output for animals and animal products. Output for animals, which represents 57.5% of animal output, is the value of animals produced either directly for slaughter, or used alive for herd renewal or for further growing and fattening. Animal products account for the remaining

42.5% and cover eggs, milk, wool, etc. (table 3) (Agricultural statistics of EU-28, 2017).

Table 3

Livestock production, 2016

Product	EU-28, housandtonnes	Estonia		Latvia		Lithuania	
		housandt onnes	percent	housandt onnes	percent	housandt onnes	percent
Bovine meat	7799.01	9.43	0.121	17.7	0.227	42.29	0.542
Pigmeat	23440.41	42.82	0.183	31.16	0.133	60.35	0.257
Poultry meat	14400.0	0.0	0.0	30.02	0.208	104.1	0.723
Drinking milk	30700.0	99.22	0.323	61.98	0.202	93.48	0.304
Cream for direct consumption	2770.0	25.65	0.926	35.99	1.299	23.38	0.844
Milk powder	2800.0	2.04	0.073	0.0	0.0	36.22	1.294
Butter	2400.0	5.14	0.214	7.2	0.300	17.67	0.736
Cheese	9616.0	43.29	0.450	38.63	0.402	97.5	1.014

In 2016, the production of raw cows' milk in the EU-28 remained relatively stable, with only a slight increase (+0.2 %). Similarly, a slight decrease was observed in the number of dairy cows (-0.4 %). High decreases were reported in Latvia (-5.2 %), Estonia (-5.0 %), Lithuania (-4.9 %).

The apparent milk yield per dairy cow in EU-28 increased by 0.6 % (40.2 kg/head), reaching 6 941 kg per dairy cow in 2016. The apparent milk yield grew strongest in Estonia (452 kg/head) and in Latvia (380 kg/head).

In 2016 nearly seven million holdings (6.92 million) reared livestock, representing 56.5 % of EU-28 farms. As a proportion of all farms, 23.5 % reared pigs, 21.4 % bovine animals (cattle, buffaloes, etc.), 18.7 % broilers, 7.7 % sheep and 4.4 % reared goats.

4. Definition of the resource potential of the region

In order to define the potential opportunities of the region in relation to the manufacture of grain products we may use, to a degree, one of the three methods for determining the resource potential. Its essence reduces itself to the determination of the total resource with the size of the so-called adjusted agricultural land, which by its structure differs significantly in the soil quality. In addition, there are some significant differences in the levels of investments per area unit, the imployment rate in individual enterprises or areas, and they often reach two-three-time value. In order to account for these objective differences, we introduce the relative resource provision indicator per area unit, and then determine the area of the adjusted agricultural land (Myroshnychenko, 1997).

We have chosen the quality of agricultural land, the provision with fixed assets and current assets, the supply of labor force given labour productivity as the resource factors. These factors are weighted by the equity ratio.

Given a large variation range of the characteristics, the value of each resource factor is weighed by the adjustment factor, which, in this case, is determined by the ratio of the magnitude of the corresponding resource of a certain area and the average region value. The adjusted area of agricultural land is determined as the product of the actual area and integrated adjustment factor, calculated according to the following formula (1) (Myroshnychenko, 1997):

$$\bar{K} = \sqrt[5]{k_B * k_{CL} * k_{CA} * k_{LF} * k_{ER}} \qquad (1),$$

where $\bar{K}$ - integrated agricultural land adjustment factor;

k_B, k_{CL}, k_{CA}, k_{LF} – factors of adjustment of soil bonitet, capital-labor ratio, current assets value, labour force participation rate per 100 ha of agricultural land;

k_{ER} – equity ratio.

Thus, it has been determined that the area of the adjusted agricultural land is distinctly different from the actual indicators, and these deviations fluctuate significantly by districts (Table 4).

In relation to the factors and their coefficients - the coefficients of variation are within the acceptable limits (from 25.3 % to 40.5%), confirming the objectivity of the performed calculations. Depending on the values of the resource factors and the level

of financial self-sufficiency, the area of individual districts can be more or less than the actual value. Accordingly, the amount of food potential will depend on the degree of influence of the resource factors and the financial self-sufficiencyof the district.

Table 4

Determination of adjusted arable land area taking into account the influence of resource factors in the districts of Sumy Region

Districts	Area of corrected lands, ths ha	Deviation from the actual value, ths ha	Plow land,%	Area of adjusted arable land, ths ha
Belopolsky	81.0	-26.0	90.0	72.9
Burinsky	60.5	-24.0	86.8	52.5
Velikopasyarivsky	55.1	-3,5	87,0	47,9
Glukhivsky	76.7	-22.3	84.4	64.7
Konotopsky	95.3	11.7	83.9	80.0
Krasnopolsky	52.9	-14.8	83.3	44.1
Krolevetsky	40.6	-17.7	72.9	29.6
Lebedinsky	99.7	-1.8	73.0	72.8
Lipovodolinsky	69.6	-1.2	78.0	54.3
Nedryhaylivskyy	70.8	2.4	90.2	63.9
Okhtyrsky	93.9	19.0	88.4	83.0
Putivlsky	57.3	-9.3	70.4	40.3
Romensky	123.0	-11.3	83.4	102.6
Seredino-Budsky	28.3	-25.0	58.0	16.4
Sumsky	136.5	20.0	80.9	110.4
Trostyanetsky	55.8	-1.9	79.9	44.6
Shostkinsky	52.1	6.6	67.9	35.4
Yampilsky	24.3	-18.0	75.2	18.3
In the region	1273.4	-117.1	79.6	1033.7

Using the product of the adjusted agricultural land area and the coefficients of its ploughness, we will determine the adjusted arable land area that will be used in further calculations of the potential agricultural production output in Sumy Region.

5. Assessment of the grain potential of Sumy Region

The definition of the importance and relevance of the above issues, and the necessity for their regulation and solutions at the regional level result in the need to develop the system of determination of the grain productionpotential, which is the

basis of the food complex, since it is recognized as the most significant branch of agriculture, the development of which influences, to the fullest extent, the provision of food to the population and, particularly, living standard.

Based on the research findings, it is worth noting that as of today the grain production is the branch of agriculture that has the most positive dynamics. However, the growth in the production output, both in general and at the regional level, could significantly reduce market prices that would adversely affect the agricultural producers.

Unfortunately, most of the options of support for grain prices are focused on the current period, i.e. they are of a short-term nature and cannot ensure the stability of their sales policy for producers. The way out is seen in stimulating the demand for the main agricultural product, primarily on the part of the industries which are traditionally the largest grain consumers, the manufacture of bread products, poultry, cattle fattening, etc.

However, it should be noted that today there is the monopolization of markets by foreign trading companies resulting in change to the structure of wholesale trade not in favor of domestic products. They invest heavily in the creation of the nationwide network of their own structures, use a variety of the protectionist measures to promote their products in the Ukrainian market. This is so much the case that these companies use the unfair methods of competition. Unfortunately, the Ukrainian trading companies and the state regional authorities are not opposed to this process, and operateseparately that leads to the expansion of food products from abroad and the aggravation of the problem of the sales of domestic products. This passivity could result in losing both food market and food security (Grygoriev, 2015).

Although Ukraine has always been and remains the breadbasket of Europe, the consumption is partly satisfied by imports. Export capacities are expanded through the activities of large agro-industrial formations, which have the possibility of entering the international market. Nowadays, such agro-industrial formations in Ukraine are the agricultural holdings, which play a crucial role in the Ukrainian economy and under the reasoned government policy could be the basis of ensuring

food security by the virtue of the socio-economic development and the formation of Ukraine's image as a highly developed industrial-agrarian country.

The volatility of prices for grain products limits the reproductive potential of the agricultural enterprises, that is, makes the destabilizing influence on the financial performance. This situation precludes commodity producers from generating the sales volumes sufficient for reproduction. Thus, the income is unstable, the costs of production are on the rise, and prices are subject to fluctuation (Lyshenko, 2015).

In view of the foregoing, there is a need for the state regulation of the grain market and support for grain sales prices. This necessitates the objective assessment of the potential opportunities on the region scale. Using the proposed methodology, we can calculate the grain potential of Sumy Region in terms of the districts (Table 5 and Picture 1).
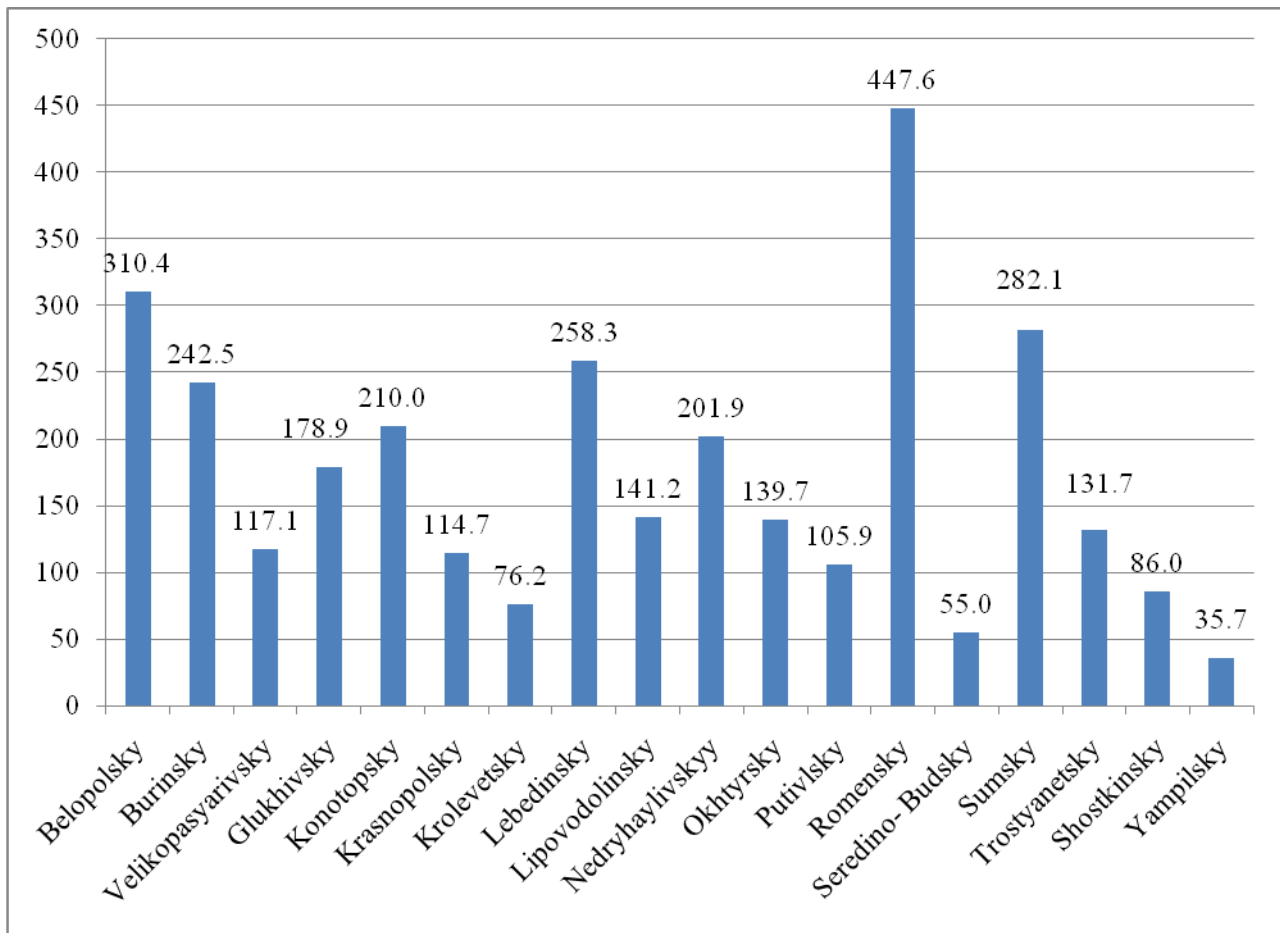
Table 5

Grain potential of the districts of Sumy Region with the existing structure of crop acreage

Districts	Area of adjusted arable land, ths ha	The share of sowing area in the area of arable land	The coefficient of marketability	Potential yields, c/ha	Potential gross tax, ths. t.
Belopolsky	72.9	0.780	0.836	65.3	371.3
Burinsky	52.5	0.916	0.798	63.2	303.9
Velikopasyarivsky	47,9	0.624	0.779	50.3	150.3
Glukhivsky	64.7	0.707	0.764	51.2	234.2
Konotopsky	80.0	0.606	0.816	53.1	257.4
Krasnopolsky	44.1	0.757	0.731	47.0	156.9
Krolevetsky	29.6	0.716	0.635	56.6	120.0
Lebedinsky	72.8	0.600	0.844	70.2	306.6
Lipovodolinsky	54.3	0.596	0.736	59.3	191.9
Nedryhaylivskyy	63.9	0.521	0.855	70.9	236.0
Okhtyrsky	83.0	0.443	0.752	50.5	185.7
Putivlsky	40.3	0.723	0.707	51.4	149.8
Romensky	102.6	0.683	0.901	70.9	496.8
Seredino-Budsky	16.4	0.914	0.645	56.9	85.3
Sumsky	110.4	0.527	0.893	54.3	315.9
Trostyanetsky	44.6	0.614	0.795	60.5	165.7
Shostkinsky	35.4	0.754	0.762	42.3	112.9
Yampilsky	18.3	0.748	0.640	40.8	55.8

In the region	1033.7	0.679	0.771	56.4	3996.4

The potential gross yield of grain is determined as the product of the adjusted arable land, the relative share of crop acres in arable land area, and average yields. The magnitude of grain potential is determined by multiplying the potential gross yield by the average marketability coefficient.

Picture 1. Grain potential of the districts of Sumy Region

According to the calculations shown in Table 3 and Picture 1, the main potential grain producers in the region are Romenskyi (14.27%), Bilopolskyi (9.9%), Sumsky (9.0%) and Lebedynsky (8.24%) and Burynsky (7.74%) districts, which account for 49.15% of the total regional grain potential.

By comparing the actual manufacture of grain products with the potential output in terms of the districts of Sumy Region, we have calculated the relevant coefficients and determined the coefficients of their self-provision (Table 6).

As evidenced by the data of Table 4, in all districts of Sumy Region, the actual volume of grain production is less than potential. The districts closer to the potential level of the manufacture of grain products are Shostkinsky (0.968), Seredyno-Budsky (0.950), Sumsky (0.948), Krolevetsky (0.938), Krasnopilsky (0.928), Glukhovsky (0,913), and Konotopsky (0.911) districts. However, these districts, except for Sumskyi, are not the main potential grain producers in the region, since their relative share in total grain sales is significantly less than 8%. Such districts as Okhtyrky (0.788), Lypovodolynsky (0.807), Velykopysarivsky (0.851), Putyvlsky (0.875), Nedrygailivsky (0.876), Trostianetsky (0.883), and to the same extent Burynsky and Yampilsky (0.888) use their production potential least of all.

Table 6

Comparison of the actual manufacture of grain products with the potential output in the context of the assessment of self-provision of Sumy Region

Districts	Actual grosstax, ths. t.	Potential gross tax, ths. t.	Absolute deviation (+/-),ths. t	Ratios of the actual production volume to the potential	Ration of self-sufficiency
Belopolsky	332.3	371.3	-39.0	0.894	7.326
Burinsky	270.0	303.9	-33.9	0.888	12.135
Velikopasyarivsky	128.0	150.3	-22.3	0.851	7.846
Glukhivsky	214.0	234.2	-20.2	0.913	10.121
Konotopsky	234.6	257.4	-22.8	0.911	8.869
Krasnopolsky	145.7	156.9	-11.2	0.928	5.486
Krolevetsky	112.6	120.0	-7.4	0.938	3.123
Lebedinsky	275.2	306.6	-31.4	0.897	15.483
Lipovodolinsky	154.9	191.9	-37.0	0.807	10.193
Nedryhaylivskyy	206.9	236.0	-29.1	0.876	9.616
Okhtyrsky	146.5	185.7	-39.2	0.788	7.002
Putivlsky	131.1	149.8	-18.7	0.875	5.383
Romensky	456.8	496.8	-40.0	0.919	14.975
Seredino-Budsky	81.1	85.3	-4.2	0.950	5.175
Sumsky	299.7	315.9	-16.2	0.948	5.057
Trostyanetsky	146.4	165.7	-19.3	0.883	4.719
Shostkinsky	109.4	112.9	-3.5	0.968	5.462
Yampilsky	49.6	55.8	-6.2	0.888	2.338
In the region	3494.7	3996.4	-501.7	0.895	7.794

Among the main potential grain producers in the region, Sumsky (0.948) and Romensky (0.919) districts use their potential to the greatest extent.

The level of self-provision of the districts of Sumy Region with grain products has been calculated by comparing the potential of manufacture of the main types of products, and taking into account the net yield of products with the rational nutritional standards. Based on the research findings, it has been established that the food potential of Sumy Region makes it possible to provide the population with grain products that 7.794 times exceeds the demand for them. Yampilsky, Krolevetsky and Trostianetsky districts have the smallest indicator of self-provision – 2.338, 3.123 and 4.719, respectively. However, given the fact that the food capacity of Lebedynsky, Romensky, Burynsky, Lypovodolynsky and Glukhivsky districts more than ten times exceeds the demand, the issue of self-provision is solved at the adequate level.

6. Assessment of the grain potential of European Union

Before the evaluation of the grain potential of European Union we have to learn about the structure of the land in this region.

Agriculture, forestry, industry, transport, housing and other services use land as a natural and/or an economic resource. Land is also an integral part of ecosystems and indispensable for biodiversity and the carbon cycle. Land can be divided into two interlinked concepts:

- land cover refers to the biophysical coverage of land (for example, crops, grass, broad-leaved woods, or built-up areas);

- land use indicates the socioeconomic use of land (for example, agriculture, forestry, recreation or residential use).

Land cover and land use data form the basis for spatial and territorial analyses which are increasingly important for:

- the planning and management of agricultural, forest, wetland, water and urban areas;

- nature, biodiversity and soil protection, and the prevention and mitigation of natural hazards and climate change.

Forests and other wooded areas occupied more than one third (37.7 %) of the total area of the EU-28 in 2016, while more than one fifth of the total area was covered by cropland (22.2 %) and by grassland (20.7 %). The remaining types of land cover in the EU-28 were much less prevalent, as shrub land occupied 7.1 % of the total area, followed by artificial land — which includes built-up areas, roads and railways — which had a 4.2 % share. The lowest shares of EU-28 land use were recorded for bare land (3.3 %), water areas (3.0 %) and wetland areas (1.7 %) (picture 2)(Agricultural statistics of EU-28, 2017).
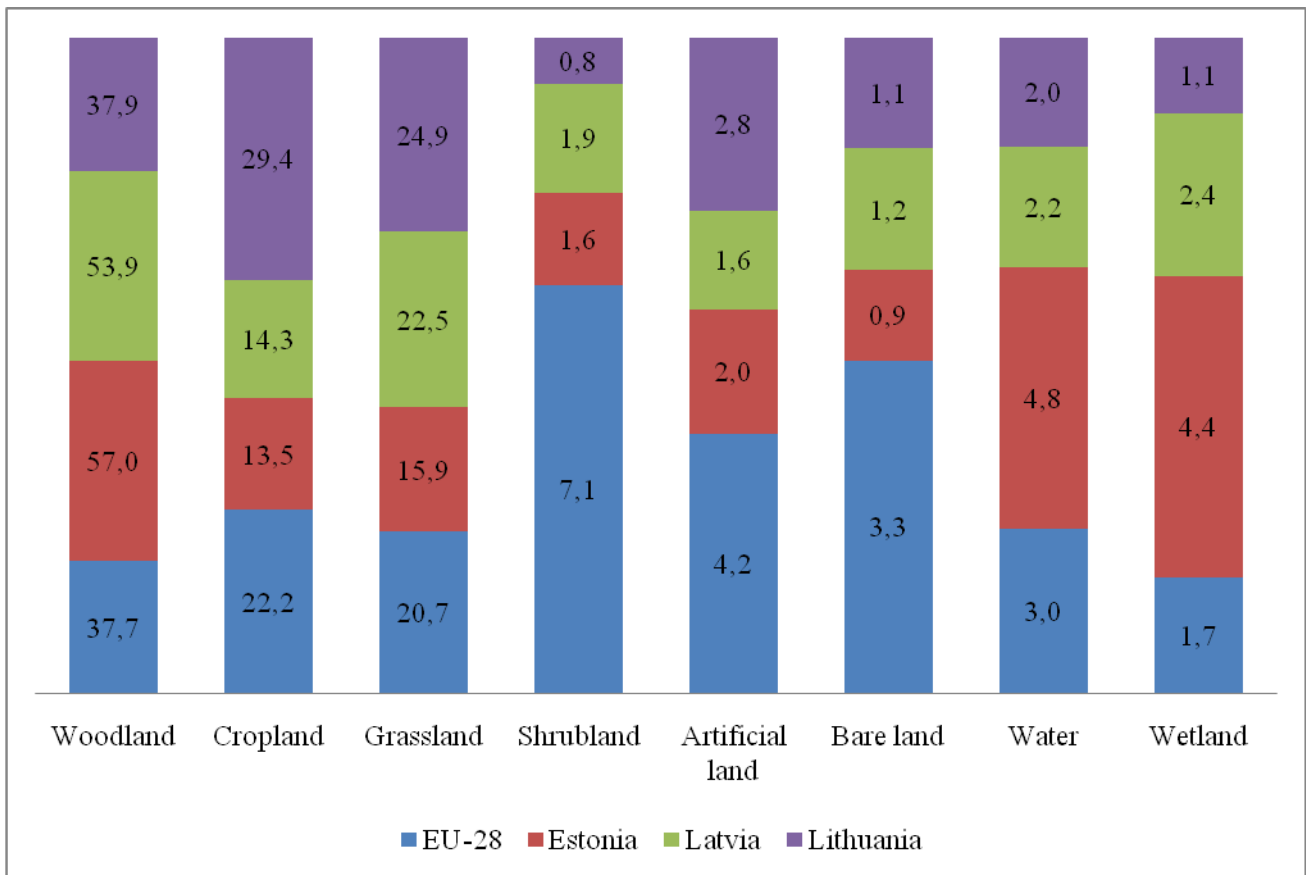
Picture 2. Main land cover by land cover type, 2016 (% of total area)

Using the proposed methodology, we can calculate the grain potential for Eu-28, Estonia, Latvia and Lithuania like we have done for the Sumy Region of Ukraine (table 7).

According to the calculations the main potential grain producers between these countries have Lithuania.

Table 7

Grain potential of the Eu-28, Estonia, Latvia and Lithuania

Country	Area of adjusted arable land, ths. ha	The share of sowing area in the area of arable land	The coefficient of marketability	Potential yields, c/ha	Potential gross tax, ths. t.	Grain potential, ths. t.
EU-28	96010,2	0,511	0,862	44,05	42290,75	36454,62
Estonia	58384,6	0,498	0,541	26,94	15729,85	94,10
Latvia	61844,4	0,477	0,581	27,71	17139,37	147,68
Lithuania	127148,6	0,482	0,590	28,44	36158,52	308,17
Average value	82459,2	0,486	0,571	27,70	23009,24	183,32

By comparing the grain potential of the Baltic countries and the Sumy region, it can be stated that this indicator is higher in Ukraine. This is due to the fact that agriculture in the regions of Ukraine has developed better than in the Baltic countries.

7. Conclusions

Summarizing the above, we believe that the priority direction of the region development should be an increase in the sales of agricultural products, given the specified potential of manufacture of agricultural food products. The solution to the problem of provision of the country and Sumy Region, in particular, with food is in the increase in the efficiency of agricultural land use. Taking the above mentioned into consideration, we consider it appropriate to transfer unused arable land to the full-fledged private and owner-operated farms, and private households. However, the large agricultural enterprises in the coming years should seek to play a more significant role in addressing the problems of food provision of the region, especially in grain crop.

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