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## Monitoring and evaluation of the efficiency of rural development of the united territorial communities of the Vinnytsia region

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► **Abstract.** Balanced development and interaction of types of economic activity form the economic potential of the region and help fill budgets. Improvement of the methodology of diagnostics of the economy of rural development taking into account natural, economic, demographic, social and recreational features is urgent. The purpose of the study was to improve and develop a methodological toolkit for assessing the effectiveness of rural development on the example of united territorial communities of the Vinnytsia region. A number of methods were used in the research process: abstract-logical, comparative analysis, tabular, statistical, calculation-constructive. According to key economic parameters, such as the pace of the Supreme Council of Justice and the volume of production per person, the Vinnytsia region is marked by a relative trend of anticipatory regional development, and the agriculture of the region in 2017-2021 retains priority positions in the structure of the agro-industrial complex of Ukraine. Analytical monitoring of the positive dynamics of the majority of economic indicators of rural development of the united territorial communities of the Vinnytsia region contributed to the growth of the partial index of the economic component. During 2017-2021, this aggregate indicator increased from 411 to 427 points, or almost 4%. It was established that the partial index of social efficiency of rural development of the united territorial communities of the region decreased by 2.4% (from 107.4 in 2017 to 104.8 points in 2021). The highest value of the index of social efficiency of rural development of united territorial communities was reached in 2017 (107.4), and the lowest in 2020 – 104.0. Calculation partial index environmental efficiency of rural development established a growth of 7.3% (from 17.2 in 2017 to 18.5 in 2021). The calculation and analytical measurement of the aggregate integral indicator of the effectiveness of rural development of the united territorial communities revealed a slight growth trend – from 91.2 in 2017 to 93.9 points in 2021, which does not exceed 3%. The practical significance of the conducted research is determined by the improvement of the toolkit and the development of a methodical algorithm for determining the integral indicator of the effectiveness of rural development of united territorial communities, which can be useful in the regional management practice of organizing monitoring and developing directions for the development of rural areas

► **Keywords:** development of rural areas; integral indicator; economic efficiency index; social efficiency index; ecological efficiency index

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## ► Introduction

Development of the region as a regional and territorial socio-economic system involves effective use of available resource potential in the process of economic, production, social, scientific and technical and other types of activity. Successful implementation of the decentralization policy, substantiation of the conceptual bases for the development of strategic directions for increasing the level of rural development, requires an objective assessment of phenomena and processes occurring in rural areas. Monitoring the development of rural areas is a mandatory prerequisite for regulating processes related to the development of agriculture, the territories of rural settlements and united territorial communities. This monitoring involves the study of the current state and effective use of the resource potential of the territories, as well as their human and social capital.

The process of analysing the level of socio-economic development for rural areas includes successive stages, including the definition of assessment criteria, the selection of indicators (indicators) and assessment methods, the assessment itself and the analysis of the results. However, there is currently no universal algorithm for the formation of indicators of the effectiveness of rural development on the basis of the balanced functioning of territorial units. There are recommendations that contribute to the creation of a set of indicators for a specific project, plan, program, or strategy. Among foreign scientists, Ya. Liu *et al.* (2022), who investigated the problems of substantiation and construction of a set of scientifically based evaluation indices for evaluating the effectiveness of the rural revitalization strategy in China. The authors proposed an index evaluation system for evaluating the effectiveness of village revitalization implementation and influencing factors from two points of view: material and spiritual life.

The problem of adaptation and evaluation of the effectiveness of the implementation of the Japanese model "One Village, One Product" (OVOP) in Vietnam was solved in their studies by L.H. Thanh *et al.* (2018). The authors proved that this model creates employment opportunities and increased employment and increased welfare of the rural population. The problems of rural development related to the mechanisms of land use and regulation of the agricultural land market in Germany were solved in their studies by D. Kirschke *et al.* (2021). The authors proved that the increase in land prices, the deterioration of ecological indicators, the structure of land use, as well as the dynamics of international prices for agricultural products are key factors affecting the level of rural development of territories.

Researcher O.V. Dovgal (2019) noted that the demographic state is the most important indicator of the development of rural areas. The authors believe that the main characteristic and prerequisite of rural development is the dynamics of relevant economic indicators. It is worth agreeing with Ya. Liu *et al.* (2022) that in the process of promoting the sustainable development of villages, it is necessary to single out the characteristics of rural development and increase the effectiveness of the implementation of rural revitalization strategies on both the material and spiritual levels. J.A. Pérez-Méndez *et al.* (2019) evaluated the impact of government subsidies on the level of rural development and the efficiency of agricultural enterprises in Spain. The results of the study showed that

subsidies have a positive effect on the technical progress of agricultural companies, and the resulting effect is materialized in the form of an increase in technical efficiency. At the same time, research focuses on substantiating the methodological aspects of assessing the effectiveness of the development of rural areas without taking into account the influence of transformational factors of the decentralization process. Many approaches to structuring, quantitative selection and mathematical substantiation of the calculation of the aggregate efficiency indicator are presented, in which attention is focused on individual factors of the development of rural areas, without updating the mechanism of rural development itself. In view of this, the existing developments require additional substantiation, clarification, and adaptation to modern conditions of the transformation processes taking place in the united territorial communities of Vinnytsia.

The purpose of the study was to measure the dynamics of the integral indicator of the effectiveness of rural development of united territorial communities on the example of the Vinnytsia region. In order to realize the set goal, it is necessary to complete the following tasks:

- carry out a comparative characterization of the dynamics of socio-economic development indicators of Ukraine and Vinnytsia region;
- to justify the toolkit for calculating the integral indicator of the efficiency of rural development of united territorial communities (UTC or ATG);
- to assess the dynamics of the level of efficiency of rural development using the method of calculating the aggregate indicator.

## ► Materials and Methods

A number of methods of scientific knowledge were used in the research process. Abstract-logical method – for formulating conclusions. The comparative analysis was used to compare the dynamics of the set of socio-economic development indicators of the Vinnytsia region with the corresponding indicators on average across Ukraine. According to the tabular method, the obtained results of the study are visually depicted. A statistical method was used to determine the variation of agricultural production indicators in Ukraine and the Vinnytsia region by category of farms. The computational and constructive method was used to analyse and compare the dynamics of natural indicators of agricultural production in Ukraine and the Vinnytsia region.

Calculation of the integral indicator of the efficiency of rural development of the united territorial communities of the Vinnytsia region, carried out according to the following algorithm:

- substantiation of the structural components of the integral index of assessment of rural development of UTC;
- calculation of individual indicators of state and development;
- construction of indices by separate blocks of indicators;
- construction of an integral index.

The partial index of the economic efficiency of rural development of the UTC is calculated based on 30 indicators that comprehensively characterize the effectiveness of the functioning of economic entities in agriculture, the

effectiveness of improving the investment climate, and the dynamics of household incomes

$$IR_{econ.t} = \sqrt[30]{\prod_{i=1}^{30} e_n}, \quad (1)$$

where  $IR_{econ.t}$  – is the partial index of economic effectiveness of rural development in ATGs;  $e_1$  – total land area, thousand hectares;  $e_2$  – area of agricultural land, thousand hectares;  $e_3$  – level of land development for agricultural purposes, %;  $e_4$  – level of plowed area for agricultural land, %;  $e_5$  – availability of agricultural land per rural resident, hectares per person;  $e_6$  – number of agricultural enterprises per 10 000 population, units;  $e_7$  – proportion of small enterprises, %;  $e_8$  – number of economic entities in agriculture, forestry, and fishery activities, units;  $e_9$  – proportion of economic entities in agriculture, forestry, and fishery activities in the total number, %;  $e_{10}$  – profitability level of agricultural, forestry, and fishery enterprises, % ( $e_{10}$ );  $e_{11}$  – proportion of employed population in agriculture, forestry, and fishery activities, %;  $e_{12}$  – average monthly nominal wage of permanent employees in agriculture, UAH;  $e_{13}$  – production of agricultural products, million UAH (at 2016 prices);  $e_{14}$  – proportion of agricultural production by household farms in total production, %;  $e_{15}$  – proportion of crop production, %;  $e_{16}$  – proportion of livestock production, %;  $e_{17}$ – $e_{25}$  – production of various agricultural products per person (kg);  $e_{26}$  – volume of agricultural products sold by agricultural producers, million UAH;  $e_{27}$  – financial results from ordinary activities before taxation: profit;  $e_{28}$  – loss;  $e_{29}$  – volume of capital investments in agriculture, million UAH;  $e_{30}$  – proportion of capital investments in agriculture, hunting, and related services in total capital investments, %.

The partial index of social effectiveness of rural development in ATGs is calculated using 39 indicators that diagnose structural shifts in the rural population, the current dynamics of housing supply, characteristics of household living conditions, changes in the state of social infrastructure elements.

$$IR_{soc.t} = \sqrt[39]{\prod_{i=1}^{39} s_n}, \quad (2)$$

where  $IR_{soc.t}$  – is the partial index of social effectiveness of rural development in ATGs;  $s_1$  – total population of ATGs, thousand people;  $s_2$  – proportion of rural population, %;  $s_3$  – number of rural residents per rural settlement, on average individuals;  $s_4$  – overall increase (-) or decrease of rural population, per 1000 people;  $s_5$  – total fertility rate per 1 woman;  $s_6$  – rural population birth rate, individuals;  $s_7$  – rural population mortality rate;  $s_8$  – economically active rural population aged 15-70, thousand people;  $s_9$  – economically inactive rural population aged 15-70, thousand people;  $s_{10}$  – level of economic activity, %;  $s_{11}$  – employment rate, %;  $s_{12}$  – unemployment rate, %;  $s_{13}$  – number of registered marriages, units;  $s_{14}$  – per 1000 population;  $s_{15}$  – number of registered divorces, units;  $s_{16}$  – per 1000 population;  $s_{17}$  – ratio of marriages to divorces;  $s_{18}$  – coverage of preschool education for children, %;  $s_{19}$  – in urban settlements;  $s_{20}$  – in rural areas;  $s_{21}$  – coverage of children in educational institutions per 100 available spots, %;  $s_{22}$  – in urban settlements;  $s_{23}$  – in rural areas;  $s_{24}$ – $s_{27}$  – number of individuals enrolled in educational institutions of different levels (at the beginning of the academic year, thousand);  $s_{28}$  – number of libraries

in rural areas, units;  $s_{29}$  – number of club establishments in rural areas, units;  $s_{30}$  – number of hospital beds, units;  $s_{31}$  – consumer price index;  $s_{32}$  – total household resources in rural areas, on average per month per household;  $s_{33}$  – value of consumed products obtained from personal subsidiary farms in rural areas, %;  $s_{34}$  – housing space per person, square meters;  $s_{35}$  – proportion of equipped flats with water supply in residential and non-residential buildings in rural areas;  $s_{36}$  – with hot water supply;  $s_{37}$  – with sewage system;  $s_{38}$  – with central heating;  $s_{39}$  – with natural gas.

The index of ecological effectiveness of rural development in ATGs is calculated using 7 indicators that characterize positive or negative changes in air and overall environmental pollution, waste management situation, monitoring of deforestation and forest resource restoration, investment in environmental protection.

$$IR_{ecol.t} = \sqrt[7]{\prod_{i=1}^7 ek_n}, \quad (3)$$

where  $IR_{ecol.t}$  – is the partial index of ecological effectiveness of rural development in ATGs;  $ek_1$  – emissions of pollutants into the atmosphere from stationary sources of pollution from agricultural, forestry, and fishery activities, thousand tons (their proportion in the overall emissions structure), %;  $ek_2$  – emissions of carbon dioxide into the atmosphere from stationary sources of pollution from agricultural, forestry, and fishery activities, thousand tons. Their proportion in the emissions structure, %;  $ek_3$  – proportion of reforested area to deforested area, %;  $ek_4$  – proportion of capital investments in environmental protection from agricultural activities to total capital investments, %;  $ek_5$  – proportion of current investments in environmental protection from agricultural activities to total capital investments, %;  $ek_6$  – proportion of area fertilized with organic fertilizers, %;  $ek_7$  – proportion of area fertilized with mineral fertilizers, %.

The integral index of effectiveness of rural development in ATGs can be determined as the cube root of the product of three partial indices: economic, social, and ecological, and analyse the obtained dynamics during the studied period.

$$IR_{tot.t} = \sqrt[3]{IR_{econ.t} \cdot IR_{soc.t} \cdot IR_{ecol.t}}, \quad (4)$$

where  $IR_{tot.t}$  – is the general index of effectiveness of rural development of the ATG in the year, t.

## ► Results and Discussion

Before the administrative-territorial reform of 2020, the Vinnytsia region had 27 districts, 6 cities of regional importance, 12 cities of regional importance, 29 urban-type settlements, 1,328 rural settlements, and 46 united territorial communities. According to the official website of the Vinnytsia Regional Council (2023), as of 2023, the Vinnytsia Region has 6 districts, 63 territorial communities. Rural areas occupy an important place in the economy of Vinnytsia, after all, in them, lives about half of the entire population of the region. It is worth noting that rural development of the territory of any region in Ukraine, firstly, it is mediated by the level of development of its agricultural sector, the dynamics of support of the state and united territorial communities of this process. A comparison of the dynamics of a

set of statistical indicators of the socio-economic development of the Vinnytsia region with the corresponding indicators of development on average across Ukraine revealed that in a number of indicators the region lags behind the average Ukraine indicator. However, a relative tendency of anticipatory regional development has been established by key economic parameters.

Thus, published data on the growth rate of the gross regional product (GRP) of the region for the period 2017-

2021 is 88.0%, which is 5.3% higher than the overall Ukrainian value, and its regional share is stable at 3.2% (Table 1). If we pay attention to the volume of GRP produced per person, the rate of growth of this indicator in the Vinnytsia region is almost 10% ahead of the all-Ukrainian rate. Thus, during the analysed period, this indicator in the region increased almost 2 times (from 58.3 to 114.2 thousand UAH), and its ratio with the average value for Ukraine increased from 83.1 to 86.7%.

**Table 1.** The main ones Indexes socio-economic development of Ukraine and Vinnytsia region in 2017-2021 year

Indicator	Units of measuring	Region	Year					2021 to 2017, %
			2017	2018	2019	2020	2021	
GRP	billion UAH	Ukraine	2 983.9	3 560.6	3 978.4	4 222.0	5 450.8	182.7
		Vinnytsia region	92.3	111.5	129.1	135.9	173.5	188.0
	The share of GRP of Vinnytsia region in GDP of Ukraine, %	3.09	3.13	3.25	3.22	3.18	—	
GRP for one a person	UAH	Ukraine	70 170	84 228	94 633	101 138	131 734	187.7
		Vinnytsia region	58 296	71 098	83 133	88 380	114 218	195.9
	Vinnytsia region in comparison with all-Ukrainian value, %	83.1	84.4	87.8	87.4	86.7	—	
People	thousands of people	Ukraine	42 584.5	42 386.4	42 153.2	41 902.4	41 588.4	97.7
		Vinnytsia region	1 590.4	1 575.8	1 560.4	1 545.4	1 529.1	96.1
	Fraction of people in Vinnytsia region in total amount of people of Ukraine, %	3.73	3.72	3.70	3.69	3.68	—	
Number of employed	thousands of people	Ukraine	16 156.4	16 360.9	16 578.3	15 915.3	15 610.0	96.6
		Vinnytsia region	640.9	652.7	660.7	634.9	621.0	96.9
Number of subjects of housing	thousands of units Vinnytsia region	Ukraine	1 805.1	1 839.7	1 941.7	1 973.7	1 956.3	108.4
		68.9	68.6	70.2	70.0	69.8	101.3	
	Share of EDROU subjects Vinnytsia region in general Numbers of subjects EDROU, %	3.82	3.73	3.62	3.55	3.57	—	
Number of enterprises on 1 thousand of existing people	units	Ukraine	42.4	43.4	46.1	47.1	47.0	111.0
		Vinnytsia region	43.3	43.6	45.0	45.3	45.4	104.7
Specific weight of hired employees of enterprises	in % to total number of employed workers	Ukraine	81.1	81.8	81.1	81.5	81.4	0.3
		Vinnytsia region	73.4	76.2	77.0	77.0	76.3	2.9
Medium-monthly salary pay	UAH	Ukraine	7 104	8 865	10 497	11 591	14 014	197.3
		Vinnytsia region	6 121	7 801	9 299	10 297	12 488	204.0
	Vinnytsia region in comparison with all-Ukrainian meaning %	86.2	88.0	88.6	88.8	89.1	—	
Arrears with payment of wages	million hryvnias	Ukraine	2 368.4	2 645.1	3 034.4	3 136.7	3 207.1	135.4
		Vinnytsia region	12.2	10.8	15.4	18.4	36.4	298.4
	The specific gravity of the Vinnytsia region in the all-Ukrainian sense, %	0.52	0.41	0.51	0.59	1.13	—	
Level of unemployment (methodology of ILO)	%	Ukraine	9.9	9.1	8.6	9.9	10.3	104.0.
		Vinnytsia region	11.0	10.2	9.7	11.0	11.4	101.8
Volumes of implemented industrial products	thousand hryvnias for one a person	Ukraine	61.7	71.8	71.6	77.2	112.5	182.5
		Vinnytsia region	38.1	44.0	50.3	55.5	58.7	154.1
Volumes of gross products of rural economy	thousand UAH on one a person	Ukraine	5.9	6.4	16.2	14.7	17.2	291.5
		Vinnytsia region	12.9	14.4	36.8	31.7	39.1	303.1
Profit/loss of enterprises before taxation	thousand hryvnias for one a person	Ukraine	1.6	1.7	2.2	1.9	5.7	356.0
		Vinnytsia region	3.7	3.4	2.4	2.0	5.4	145.7

Table 1, Continued

Indicator	Units of measuring	Region	Year					2021 to 2017, %
			2017	2018	2019	2020	2021	
Amount of capital investments on one a person	UAH	Ukraine	10 598	13 746.4	14 907	10 030	12 719	120.0
		Vinnitsia region	7 451.8	11 291.7	10 172.5	6 463.7	9 157.8	122.9
	Vinnitsia region in comparison with all-Ukrainian value	0.70	0.82	0.68	0.64	0.72	—	
including by funds of state and local budgets	% to general sum	Ukraine	12.7	12.6	14.0	19.1	17.6	+4.9
		Vinnitsia region	16.8	11.2	17.7	12.4	17.6	+0.8
Coefficient of coverage of imports by exports		Ukraine	0.88	0.83	0.83	0.92	0.94	106.9
		Vinnitsia region	3.00	2.44	2.67	2.53	1.86	61.9
Budget revenues on one person	UAH	Ukraine	4 727	5 844.2	6 914	7 468.8	9 003.6	190.5
		Vinnitsia region	4 543.6	5 573.4	6 550.3	7 093.9	8 627.4	189.9
	Vinnitsia region in comparison with all-Ukrainian value	0.96	0.95	0.95	0.95	0.96	—	
Expenses for oneperson	UAH	Ukraine	6 170.2	7 611.1	8 938.2	9 537	11 724.4	190.0
		Vinnitsia region	5 424.5	6 675.8	8 155.7	8 720.3	10 301.4	189.9
	Vinnitsia region in comparison with all-Ukrainian value	0.88	0.88	0.91	0.91	0.79	—	
Expenses on education for one person	UAH	Ukraine	1 860	2 076	2 664	2 688	3 252	174.8
		Vinnitsia region	2 220	1 680	2 412	2 218	3 540	159.5
	Vinnitsia region in comparison with all-Ukrainian value	1.19	0.81	0.91	0.83	1.09	—	
Expenses on protection health on one person	UAH	Ukraine	3 048	4 116	4 356	5 136	6 365	208.8
		Vinnitsia region	3 019	3 864	4 352	5 208	6 348	210.3
	Vinnitsia region in comparison with all-Ukrainian value	0.99	0.94	1.00 a.m	1.01	1.00 a.m	—	

**Source:** generated and calculated by the author based on the official data website of the State Statistics Service of Ukraine in the Vinnitsia region (2023)

For the period 2017-2021, the growth rates of the number of economic entities and enterprises per 1 000 people of the existing population in Vinnitsia region were lower than the average indicators for Ukraine – 101.3% and 104.7%, respectively. The ratio of the average monthly salary in comparison with the average Ukrainian value increased from 86.2% (2017) to 89.1% (2021), and the absolute amount increased more than 2 times, to 12 488 UAH. The arrears for the payment of wages in the oblast increased almost threefold during this period, and the share of the oblast in the total arrears increased from 0.52% to 1.13%. The unemployment rate in the region rose to 11.4%, which is 1.1 percentage points higher than the average Ukrainian level. The indicator of the volume of industrial products sold per person in the region is half the average level in the country. However, the volume of agricultural products in the region exceeds the average Ukrainian level by more than two times (39.1 thousand UAH compared to 17.2 thousand UAH). The profitability of agricultural enterprises in Vinnitsia corresponds to the national average – UAH 5.4 thousand per person.

The volume of capital investments per person in the region lags behind the national indicator by almost a third – UAH 9 158 compared to UAH 12 719 on average in Ukraine. However, the growth of this indicator in the region during the analysed period (122.9%) exceeds the similar indicator in Ukraine by almost 3%. Budgetary income per person in the region grew at a slower rate than the average for

Ukraine – by 89.9% (from UAH 4.5 thousand in 2017 to UAH 8.6 thousand in 2021). The amount of expenditures per person in the region at the end of 2021 is 21% behind the national indicator – 10.3 thousand UAH compared to 11.7 thousand UAH. The amount of expenditures on health care in the region corresponds to the Ukrainian indicator – UAH 6 348, and on education it exceeds it by 9% – UAH 3 540 per person compared to UAH 3 252 in Ukraine.

The start of a full-scale war with Russia led to a sharp decline in economic activity, both in Ukraine as a whole and in economic entities of Vinnitsia. Physical destruction, a very high level of uncertainty and risks, deformation and disruption of logistical and production ties, significant migration of the population have an extremely negative impact on the indicators of socio-economic development of the united territorial communities of the region.

It is worth stating that the agriculture of the Vinnitsia region maintains a priority position in the structure of the agro-industrial complex of Ukraine. There are 4 283 economic entities operating in the industry, of which 841 are agricultural enterprises, 1 893 are farms. The number of personal peasant farms in the region is 274.4 thousand (Official website of..., 2023). In the agriculture of Vinnitsia region, 2012.0 thousand ha of agricultural land is used (1 730.5 ha – arable land, 48.0 thousand ha – perennial plantations, 48.8 thousand ha – hayfields, 183.9 thousand ha – pastures). The region ranks 9th among the regions of Ukraine in terms of agricultural land. Almost 50% of which are chernozems.

According to the results of 2021, the agricultural sector of the region confidently took first place in terms of the following indicators:

- production of agricultural products;
- production of agricultural products per person;
- production (sale) of meat;
- number of poultry;
- production of grain crops, sugar beets and fruit and berry products.

In terms of milk production and the number of cows, Vinnytsia ranked second. However, during 2017-2021, the number of cattle in all categories of farms in the region

decreased by 40% (from 308.8 to 185.6 thousand heads). The number of pigs decreased by almost half – from 351.3 to 203 thousand heads. However, a significant increase (by almost 40%) was recorded in the poultry industry, where the population grew from 27.6 to 38.1 million heads during the analysed period.

During 2017-2021, the growth rate of agricultural production by farms of all categories amounted to 116.4%, which exceeds the similar indicator in Ukraine as a whole by 1.6% (Table 2). The specific weight of the Vinnytsia region in the production of agricultural products ranges from 7.96 to 8.42%.

**Table 2.** Agricultural production of Ukraine and Vinnytsia region by farm category, 2017-2021, billion UAH (at constant 2016 prices)

Name of indicators	2017		2018		2019		2020		2021		2021 to 2017, %	
	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region
Farms of all categories												
Agricultural products	620.5	51.1	671.3	56.5	681.0	57.2	612.1	48.7	712.6	59.5	114.8	116.4
specific weight, %	8.24		8.42		8.40		7.96		8.35		0.11	
Product of crop production	480.2	36.8	529.3	41.7	538.7	39.4	473.4	30.8	580.3	42.0	120.8	114.1
specific weight, %	7.66		7.88		7.31		6.51		7.24		-0.43	
Product of animal husbandry	140.3	14.3	141.9	14.8	142.3	17.7	138.7	17.8	132.3	17.4	94.3	121.7
specific weight, %	10.19		10.43		12.44		12.83		13.15		2.96	
Agricultural enterprises												
Rural products	391.0	35.2	438.0	40.9	449.8	42.4	395.7	35.2	484.1	45.4	123.8	129.0
specific weight, %	9.00		9.34		9.43		8.90		9.38		0.38	
Products of crop production	323.7	25.9	367.7	30.8	376.8	29.1	323.2	21.5	413.0	31.8	127.6	122.8
specific weight, %	8.00		8.38		7.72		6.65		7.70		-0.30	
Product of animal husbandry	67.3	9.3	70.3	10.0	73.0	13.3	72.5	13.6	71.1	13.7	105.6	147.3
specific weight, %	13.82		14.22		18.22		18.76		19.27		5.45	
Households												
Rural products	229.5	15.9	233.3	15.6	231.2	14.8	216.4	13.5	228.5	14.1	99.6	88.7
specific weight, %	6.93		6.69		6.40		6.24		6.17		-0.76	
Product of crop production	156.4	10.9	161.7	10.9	161.9	10.3	150.2	9.3	167.3	10.3	107.0	94.5
specific weight, %	6.97		6.74		6.36		6.19		6.16		-0.81	
Product of animal husbandry	73	5	71.6	4.7	69.3	4.4	66.2	4.2	61.2	3.8	83.8	76.0
specific weight, %	6.85		6.56		6.35		6.34		6.21		-0.64	

**Source:** generated and calculated by the author based on the official data website of the State Statistics Service of Ukraine in the Vinnytsia region (2023)

Analysing the data in Table 2, an important result is the fact that the growth rates of crop production and livestock production significantly exceeded the indicators of agricultural enterprises in comparison with other farms. The analysed information confirms the important role of agricultural enterprises in increasing production volumes and maintaining stability in the production of crop and

livestock products. However, it is worth noting that the rate of decline in agricultural production in the households of the region is ahead of the national level. This aspect may require attention and further analysis to ensure the sustainable development of the agricultural sector in the region.

Regarding the dynamics of natural indicators of regional crop production, the production of grain and

leguminous crops for the period 2017-2021 increased by a third – from 4.89 to 6.54 million tons, and the specific weight in the all-Ukrainian production decreased slightly from 7.9 to 7.6% (Table 3).

**Table 3.** Dynamics of agricultural production in Ukraine and Vinnytsia region, 2017-2021 million tons

Product type	2017		2018		2019		2020		2021		2021 to 2017, %	
	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region	Ukraine	Vinnytsia region
Cereal and leguminous crops	61.92	4.89	70.06	5.91	75.14	5.94	64.93	4.02	86.01	6.54	138.9	133.7
specific weight, %	7.90		8.44		7.90		6.18		7.60		-0.30	
wheat	26.16	1.74	24.61	1.67	28.33	1.83	24.88	1.35	32.15	1.77	122.9	101.7
barley	8.28	0.47	7.35	0.39	8.92	0.49	7.64	0.35	9.44	0.43	113.9	92.3
corn	24.67	2.55	35.80	3.75	35.88	3.57	30.29	2.28	42.11	4.28	170.7	167.5
Sunflower	12.24	0.73	14.17	0.81	15.25	0.85	13.11	0.77	16.39	0.98	134.0	135.7
specific weight, %	5.93		5.70		5.55		5.90		6.01		0.08	
Factory sugar beet	14.88	2.83	13.32	3.15	9.66	1.95	8.63	2.00 a.m	10.35	2.31	69.6	81.4
specific weight, %	19.05		23.65		20.20		23.20		22.28		3.23	
Potato	22.21	1.88	22.50	1.91	20.27	1.83	208.38	1.91	21.36	1.60	96.2	84.6
specific weight, %	8.49		8.48		9.01		0.92		7.47		-1.02	
Vegetable crops	9.29	0.48	9.44	0.46	9.69	0.46	9.65	0.43	9.94	0.50	107.0	104.1
specific weight, %	5.20		4.89		4.70		4.45		5.06		-0.14	
Fruits and berries	2.05	0.23	2.57	0.33	2.12	0.23	2.02	0.22	2.24	0.27	109.1	115.9
specific weight, %	11.40		12.92		11.08		10.82		12.12		0.72	
Meat	3.21	0.32	3.37	0.35	3.45	0.46	3.41	0.47	3.33	0.47	103.9	147.2
specific weight, %	9.97		10.43		13.32		13.86		14.14		4.18	
Milk	10.28	0.85	10.06	0.82	9.66	0.76	9.26	0.73	8.71	0.69	84.8	80.6
specific weight, %	8.28		8.20		7.90		7.88		7.87		-0.41	
Eggs, billion pcs	15.51	0.95	16.13	0.92	16.68	0.93	16.17	0.87	14.07	0.71	90.7	74.9
specific weight, %	6.10		5.69		5.60		5.37		5.04		-1.06	
Honey, thousand tons	66.2	4.20	71.3	4.39	69.9	3.91	68.0	3.73	68.6	3.87	103.6	92.1
specific weight, %	6.34		6.16		5.59		5.49		5.64		-0.70	

**Source:** generated and calculated by the author based on the official data website of the State Statistics Service of Ukraine in the Vinnytsia region (2023)

Among grain crops, the highest production growth rates were recorded for corn – 167.5% (from 2.55 to 4.28 million tons). The production of sunflower by farms in the Vinnytsia region increased by 135.7%, fruits and berries – by 115.9%, vegetable crops – by 104.1%, wheat – by 101.7%. As already mentioned, in 2021, Vinnytsia took first place among the regions of Ukraine in terms of meat production. Thus, the farms of the region produced 0.47 million tons of meat, which is 147.2% more than the level of 2017, and the specific weight in the total production in the country increased from 9.97% in 2017 to 14.14% in 2021. According to other types of agricultural products, a decrease in production was recorded. Thus, the largest drop (by almost 25%) was experienced by the production of eggs – from 950 to 710 million units. the production of milk decreased by 19.4%, sugar beets – by 18.6%, potatoes – by 15.4%.

In the course of the study, a partial and integral index of the state and development of rural areas was calculated. As separate blocks of indicators, attention is focused on

economic, social and environmental components. Thus, for the analysed period, a relative improvement of the following economic indicators of rural development of the ATG oblast was established:

- the volume of products sold by agricultural producers (increase from UAH 31.6 to 39.2 billion);
- the volume of agricultural production (at 2016 prices) (increased from UAH 51.1 to 59.4 billion);
- increase in profit from ordinary activities before taxation (from UAH 6 275.4 to UAH 7 010.7 million);
- the average monthly nominal salary of full-time employees in agriculture (increase from UAH 6 499 in 2017 to UAH 11 910 in 2021), or by 83.3%;
- growth of production per person of such types of products as: meat (by 51.5%), sunflower (by 39.7%), cereals and legumes (by 37.7%), fruits and berries (by 19.6%), vegetables (by 7.5%);
- growth of the share of the employed population in agriculture from 31.2% to 31.6% (Table 4).

**Table 4.** Dynamics of economic indicators of rural development of the ATG of the Vinnytsia region, 2017-2021

Name of indicators	2017	2018	2019	2020	2021	2021 to 2017, %
Total land area, thousand hectares	2 649.2	2 649.2	2 649.2	2 649.2	2 649.2	100.0
Area of agricultural land, thousand hectares	2 014.2	2 012.0	2 012.0	2 012.0	2 012.0	99.9
The level of agricultural land development, %	76.0	75.9	75.9	75.9	75.9	99.9
The level of plowing of agricultural land, %	<b>65.1</b>	65.1	65.1	65.1	65.1	100.0
Availability of agricultural land, ha per village resident	2.68	2.72	2.76	2.81	2.74	102.2
The number of agricultural enterprises per 10 000 people of the existing population, units.	58	62	66	<b>63</b>	<b>58</b>	100.0
Share of small enterprises, %	94.8	94.4	94.0	94.0	95.2	100.4
Number of economic entities in agriculture, forestry and fisheries, units	4 535	4 432	4 406	<b>4 286</b>	<b>4 093</b>	90.3
The share of economic entities in agriculture, forestry, and fisheries in the total number, %	6.6	6.4	6.3	<b>6.1</b>	<b>6.1</b>	92.4
The level of profitability of agricultural, forestry and fishing enterprises, %	25.8	19.8	10.5	16.4	17.5	0.0
The share of the employed population in agriculture, forestry and fisheries, %	31.2	31.8	32.9	34.1	31.6	101.3
Average monthly nominal salary of full-time employees in agriculture, hryvnias	6 499	8 317	10 203	10 699	11 910	183.3
Production of agricultural products, million hryvnias (at 2016 prices)	51 111.3	56 520.9	57 168.9	48 688.6	59 448.8	116.3
Share of production of agricultural products by households, %	31.1	27.7	25.8	27.8	23.7	76.2
Share of crop production, %	72.0	73.8	68.0	63.3	70.7	98.2
Share of livestock products, %	28.0	26.2	31.0	36.7	29.3	104.6
<b>Production of agricultural products, per person (kg)</b>						
Cereal and leguminous crops	3 088	3 770	3 823	2 612	4 252	137.7
Factory sugar beet	1 790	2 008	1 256	1 302	1 498	83.7
Sunflower	458	515	545	503	640	139.7
Potato	1 191	1 217	1 176	1 241	1 037	87.1
Vegetable crops	305	294	293	280	328	107.5
Fruit and berry crops	148	212	151	143	177	119.6
Meat (in slaughter mass)	202	224	296	307	306	151.5
Milk	538	526	492	475	446	82.9
Eggs, pc.	597	585	601	565	461	77.2
The volume of products sold by agricultural producers, million hryvnias	31 595.6	36 283.5	38 753.1	36 152.8	39 209.7	124.1
Financial results from ordinary activities before taxation:						
profit	5 860.4	5 394.0	3 734.7	3 040.8	5 534.8	94.4
loss	6 275.4	6 299.3	4 315.2	4 792.4	7 010.7	111.7
volumes of capital investments in agriculture, million hryvnias	415.0	905.3	580.5	1 751.6	1 475.8	355.6
Volumes of capital investments in agriculture, million hryvnias	4 627	4 803	3 982	2 986	3 140	67.9
The share of capital investments in agriculture, hunting, and the provision of related services to the total volume, %	38.9	26.8	25.1	21.8	22.4	57.6
<b>Partial index of economic efficiency of rural development of ATG</b>	<b>410.9</b>	<b>428.2</b>	<b>396.7</b>	<b>403.0</b>	<b>426.8</b>	<b>103.9</b>

**Source:** generated and calculated by the author based on the official data website of the State Statistics Service of Ukraine in the Vinnytsia region (2023)

According to other indicators of the economic bloc, a gradual decline is observed. Thus, the number of economic entities in agriculture during 2017-2021 decreased by 10% (from 4 535 to 4 093 units), and their share in the total number decreased from 6.6 to 6.1%. It was established that the share of agricultural production by households decreased from 31.1% in 2017 to 23.7% in 2021. Despite a significant improvement in the rating of Vinnytsia according to the capital investment index in 2021, the amount of capital investment in agriculture over the last five years decreased by a third – from UAH 4.627 million in 2017 to UAH 3.140 million in 2021. At the same time, the share of capital investments in the region's agrarian economy in the total volume decreased by 16.5%.

The practical approbation of the methodological toolkit for measuring and diagnosing the level of efficiency of rural development of the Vinnytsia Oblast ATG made it

possible to determine relatively positive dynamics of the partial index of the economic component. Thus, during 2017-2021, this aggregate indicator grew by 3.9% (from 410.9 in 2017 to 426.8 in 2021). The highest value of the index of economic efficiency of rural development of the ATG was recorded in 2018 (428.2), and the lowest in 2019 – 396.7. During 2017-2021, there is a gradual (on average by 1% per year (by 15-16 thousand people)) decrease in the total population of the ATG oblast. During the analysed period, this indicator decreased by 61.3 thousand people. The average indicator of the number of rural population in population per settlement decreased from 535 in 2017 to 503 in 2021. The total birth rate in the village decreased by 16.2%, and the death rate increased by 10.5% (Table 5). At the same time, a stable trend in the number of active population was established in villages aged 15-17 years – from 336.9 thousand in 2017 to 338.4 thousand people in 2021.

**Table 5.** Dynamics of social indicators of rural development of the ATG of Vinnytsia region, 2017-2021

Name of indicators	2017	2018	2019	2020	2021	2021 to 2017, %
Total population of ATG, thousands of people	1 590.4	1 575.8	1 560.4	1 545.4	1 529.1	96.1
Share of the rural population, %	49.1	48.8	48.6	48.3	47.9	97.6
Number of rural populations based on one rural settlement, on average persons	535	528	521	512	503	94.0
Total increase, reduction (-) of rural population, per 1,000 people	-8 067	-8 902	-9 120	-9 239	-11 300	140.1
Total fertility rate per woman	1 355	1 262	1 205	1 203	1 135	83.8
The birth rate of the rural population, persons	6 741	5 989	5 545	5 448	5 251	77.9
Mortality rate of the rural population	19.1	19.5	19.5	19.9	21.1	110.5
Economically active rural population aged 15-70, thousand people	336.9	338.8	340.1	343.7	338.4	100.4
Economically inactive rural population aged 15-70, thousand people	211.9	204.6	198.5	187.7	184.0	86.8
Level of economic activity, %	43.2	44.0	44.8	46.0	45.8	106.0
Employment rate, %	55.9	57.0	57.8	58.2	58.7	105.0
Unemployment rate, %	8.9	8.6	8.5	10.0	9.4	105.6
Number of registered marriages, unit	9 527	8 904	9 361	6 319	8 104	85.1
Per 1000 of the existing population	6.0	5.7	6.0	4.1	5.3	88.3
The number of registered divorces	5 445	6 244	5 617	4 840	5 046	92.7
Per 1000 of the available population	3.4	4.0	3.6	3.1	3.3	97.1
The ratio of the number of marriages and divorces	1.7	1.4	1.7	1.3	1.6	94.1
Enrolment of children in preschool educational institutions, % of the number of children of the appropriate age	67	69	71	72	70	104.5
In urban settlements	86	88	93	95	94	109.3
In the countryside	47	48	48	49	46	97.9
Coverage of children in institutions based on 100 places, %	<b>111</b>	<b>110</b>	<b>104</b>	<b>101</b>	<b>94</b>	84.7
In urban settlements	135	135	126	122	116	85.9
In the countryside	84	82	78	76	67	79.8
The number of people who studied in educational institutions (at the beginning of the academic year, thousands)	215.9	219.1	218.2	226.3	<b>211.4</b>	97.9
In secondary education institutions	157.5	161.8	164.9	166.9	166.4	105.7
In institutions of professional and technical education	13.5	12.7	11.9	11.7	12.2	90.4
In institutions of higher education	44.9	44.6	41.4	39.3	32.8	73.1

Table 5, Continued

Name of indicators	2017	2018	2019	2020	2021	2021 to 2017, %
Number of libraries in the countryside	826	825	823	819	816	98.8
Number of club establishments, units in the countryside	1018	1016	997	1017	985	96.8
Number of hospital beds, unit	10 935	10 822	10 566	10 261	9 769	89.3
Consumer price index	113.0	109.0	102.4	102.9	108.7	96.2
Aggregate resources of households in rural areas, on average per month per household	7 752.2	8 195.0	11 551.9	11 603.6	12 673.7	163.5
The cost of consumed products obtained from personal subsidiary farms in rural areas, %	10.5	10.5	8.3	<b>8.3</b>	<b>8.2</b>	78.1
Availability of living space, sq. m per person	35.2	35.7	36.3	37.0	37.3	106.0
Specific weight of equipped flats in residential buildings and non-residential buildings in rural areas, % with water supply	21.4	22.5	23.2	23.8	24.1	112.6
hot water supply	12.0	12.1	12.4	12.4	12.6	105.0
sewage	18.7	19.3	20.0	20.3	20.3	108.6
central heating	41.5	42.3	42.3	42.4	42.2	101.7
natural gas	81.3	81.5	82.2	82.2	82.0	100.9
<b>Partial index of social efficiency of rural development of the ATG</b>	<b>107.4</b>	<b>107.0</b>	<b>106.9</b>	<b>104.0</b>	<b>104.8</b>	<b>97.6</b>

**Source:** generated and calculated by the author based on the official data website of the State Statistics Service of Ukraine in the Vinnytsia region (2023)

In turn, the economically inactive rural population of Vinnytsia region experienced a significant decrease – from 211.9 thousand people in 2017 to 184 thousand in 2021. Accordingly, the level of economic activity in the village during the analysed period increased from 43.2 to 45.8%, the level of employment increased by 5.0%. Regarding the assessment of the state and dynamics of the social infrastructure, we note that it is the qualitative dynamics of its components that largely mediate and contribute to the rural development of the ATG. A developed social infrastructure contributes to the consistent reduction of unnecessary migration and personnel rotation, and also contributes to the formation of stable work groups in existing agricultural structures. During the analysed period, the overall index of coverage of children in the region by preschool education institutions increased from 67 to 70%. However, if in urban settlements this ratio is from 86% to 94%, then in rural areas it even decreased from 47% in 2017 to 46% in 2021. That is, all forms of acquisition preschool education covered only 46 % of rural children

If the total number of people studying in secondary education institutions of the region during the analysed period increased by 5.7% (from 157.5 to 166.4 thousand people), then in rural areas there is a completely negative dynamic. Thus, during 2017-2021, the number of rural institutions of general secondary education decreased by 23% (from 632 to 488). At the same time, the number of students decreased by 6.6% or by 4 190 people. The dynamics of such components of the social infrastructure in the village, such as the presence of hospitals, libraries, and clubs in the Vinnytsia region, is relatively stable. Thus, during 2017-2021, the number of hospital beds in rural areas decreased by 10.7% (from 10 935 to 9 769 units), libraries – by 1.2% (from 826 to 816 units), and club facilities – by 3.2% (from 1 018 up to 985 units).

A fairly positive trend is the comparison of the ratio of the regional consumer price index and the growth dynamics of aggregate household resources in rural areas. Thus, during 2017-2021, the consumer price index decreased in annual terms from 113 to 108.7%, and the average monthly indicator of aggregate resources of households in rural areas per household increased by 63.5% (from UAH 7 752 to UAH 12 674). The condition of the rural housing stock has improved relatively. Provision of living space per rural resident increased from 35.2 to 36.3 m<sup>2</sup>, and the rate of equipment of flats in residential buildings and non-residential buildings in rural areas with water supply increased from 21.4 to 24.1%. The level of gasification of housing in rural areas of the region is 82%.

The dynamics of the partial index of social efficiency of rural development of the ATG were determined and evaluated. During 2017-2021, this aggregate indicator decreased by 2.4% (from 107.4 in 2017 to 104.8 in 2021). The highest value of the index of social efficiency of rural development of the ATG was experienced in 2017 (107.4), and the lowest in 2020 – 104.0. In the course of the study, the index of ecological efficiency of rural development of ATG was calculated based on 7 indicators that allow monitoring the state of the environment – air pollution, the situation with the removal and disposal of waste, as well as the investment policy in the field of environmental protection (Table 6). Calculation partial index of environmental efficiency of rural development of the Vinnytsia Oblast ATG revealed a positive growth rate of 7.3% (from 17.2 in 2017 to 18.5 in 2021).

Based on the determination of the partial indicators of the economic, social and ecological components of the efficiency of rural development, the calculation and analytical measurement of the aggregate integral indicator was carried out (Table 7).

**Table 6.** Dynamics of ecological indicators of rural development of the ATG of Vinnytsia region, 2017-2021

Name of indicators	2017	2018	2019	2020	2021	2021 to 2017, %
Emissions of polluting substances into atmospheric air from stationary sources of pollution in agriculture, forestry and fisheries, thousand tons. Their share in the total structure of emissions, %	19.9	11.8	15.2	15.9	11.5	57.8
Emissions of carbon dioxin into the atmospheric air from stationary sources of pollution in agriculture, forestry and fisheries, thousand tons. Their share in the structure of emissions, %	4.6	1.6	6.8	6.9	6.3	137.0
The share of forest reproduction areas to the areas of forest cuttings, %	14.9	14.8	10.2	8.9	11.0	73.8
The share of capital investments for environmental protection from agriculture from the total amount of capital investments, %	26.1	29.1	23.1	16.3	45.4	173.9
The share of current investments for environmental protection from agriculture from the total volume of capital investments, %	73.9	70.9	76.9	83.7	54.6	73.9
Share of the area fertilized with organic fertilizers, %	1.8	1.8	3.9	3.5	3.9	216.7
Share of the area fertilized with mineral fertilizers, %	94.5	94.6	94.9	91.9	95.3	100.8
<b>Partial index of environmental efficiency of rural development of ATG</b>	<b>17.2</b>	<b>13.9</b>	<b>18.3</b>	<b>17.1</b>	<b>18.5</b>	<b>107.3</b>

**Source:** generated and calculated by the author based on the official data website of the State Statistics Service of Ukraine in the Vinnytsia region (2023)

**Table 7.** Integral indicator of the efficiency of rural development of Vinnytsia Oblast, ATG, 2017-2021

Name of indicators	2017	2018	2019	2020	2021	2021 to 2017, %
Partial index of economic efficiency of rural development of ATG	410.9	428.2	396.7	403.0	426.8	103.9
Partial index of social efficiency of rural development of the ATG	107.4	107.0	106.9	104.0	104.8	97.6
Partial index of environmental efficiency of rural development of ATG	17.2	13.9	18.3	17.1	18.5	107.3
<b>An integral indicator of the efficiency of rural development of the ATG</b>	<b>91.2</b>	<b>86.0</b>	<b>91.9</b>	<b>89.5</b>	<b>93.9</b>	<b>102.9</b>

**Source:** calculated by the authors

Over the analysed period and the integrated indicator of the regional effectiveness of rural development, the ATG experienced an increase of only 2.9% (from 91.2 in 2017 to 93.9 in 2021, which is the maximum value). The negative impact on the value and dynamics of the integral indicator was caused by structural deformations of the social component itself. Comparing the obtained results with the results of other researchers, the results of A.P. Sava (2018) are important, they are about the fact that the assessment of the level of socio-economic development of rural areas is a set of consecutive operations for establishing criteria, selecting indicators, justifying the methodology and its practical implementation. So, indeed, there is no universal algorithm for the formation of indicators of the effectiveness of rural development. In the course of the study, an algorithm for calculating the integral indicator of the effectiveness of rural development was developed and tested, taking into account the regional specificity of the

functioning of the united territorial communities of the Vinnytsia region (Trusova *et al.*, 2021).

Author M.M. Tymoshenko (2018) tried to justify and develop an analytical-synthesizing scheme for researching the current state of rural areas and their components. Comparing the studies, this article improved the methodical approach to evaluating the effectiveness of rural development, which has the character of a dynamic mechanism and is based on detailed structuring and meaningful filling of the components of the integral indicator of effectiveness. So, for assessing rural development in united territorial communities, various structural systems of indicators and criteria can be applied, as substantiated in the research by N. Mokhort (2018), T.V. Usyuk & L.V. Farion (2018), N.L. Khomyuk & N.V. Pavliukha (2019). According to the authors, the diversity of indicators and criteria can be structured into two groups - diagnostic (monitoring) indicators and criteria of effectiveness and efficiency of development.

Similarly, to the research by O.Yu. Borovska (2017), the study is based on a system of regional diagnosis, encompassing economic, social, and ecological components, structurally detailed with a specific set of indicators and calculation tools proposed. In contrast to V.S. Kravtsiv & I.Z. Storonyanska (2020), who suggested computing a synthetic weighted index using a formula of weighted arithmetic mean, this article employs a mathematical calculation framework involving the  $n$ -th root of the product of selected criteria (indicators). S. Hussain *et al.* (2022) delved into the influence of socio-economic factors on the development of rural communities in Pakistan. The authors justified a development support strategy for rural areas centred on implementing infrastructure projects as fundamental tools to enhance the socio-economic conditions of rural populations. The essential distinction between the concepts of “rural territory development” and “rural development” is rooted in the former concentrating on organizational, economic, production, and infrastructure-related components, while the latter focuses on ensuring a dignified level of social security and rural population well-being. Hence, the assessment practice of the effectiveness of implementing the Japanese “One Village, One Product” model, which contributes to rural population employment and well-being, as explored by L.H. Thanh *et al.* (2018), is quite intriguing for further research.

Conclusions drawn by S. Hussain *et al.* (2022) affirm that the practice of implementing public infrastructure projects is the foundation of rural territory development and improving the quality of life. Results from the research by J.A. Pérez-Méndez *et al.* (2019) established a positive impact of government subsidies on the dynamics of rural territory development. An important direction for further investigation would be to examine and justify the mechanisms through which state support instruments for the agricultural sector in Ukraine influence the level of rural community development. Polish researchers A. Pawlik *et al.* (2021) studied the influence of the community’s budget potential and its dependency on state budget allocations on the dynamics of rural development. Indeed, the socio-economic potential of a region, district, or community (of any territorial-administrative entity) is shaped within the respective territory by economic entities and the population. The centrally formulated budget-tax system, represented locally as municipal budgets, plays a key role in this process.

A noteworthy empirical experience is the practical application of selecting indicators relative weights for evaluating the degree of rural area development, as executed by X. Liu *et al.* (2021). An important insight is that by clearly defining rural development criteria, selecting indicators with a certain number of structural components, a combination of methodological approaches can be used to analyse, assess, and visually express the level of development of a specific rural area. Significant results from the research of B. Hennebry & T. Strykiewicz (2020) introduced the “structural strength” index to measure the socio-economic development of rural territories. Analysing models of urban spread and justifying guiding principles for planning rural areas in transitional zones between urban and rural areas in the Turkish Mediterranean city of Antalya, S. Balta & M. Atik (2022) dedicated their research. The authors developed an effective planning tool

based on ecological, spatial, and social characteristics of both rural and urban territories, ensuring the continuity of rural features to support agricultural productivity and protect natural biodiversity (Gutorov, 2021).

Noteworthy is the work of G. Gargano (2021), which focuses on the comparative evolution of policies and methodological approaches for rural area development and local groups in the United Kingdom and Italy. The author examined the effectiveness of EU strategies for rural development, measured how management structure, institutional mechanisms, and economic potential influence the level of rural development across different EU countries. The impact measurement of the LEADER development strategy on its spheres of activity, as well as the efficiency of managing European aid for rural territory development in Spain to enhance economic activity and address demographic and socio-economic challenges in the most depressed municipalities, was the focus of research by G.C. Alonso & N.A. Masot (2020). Ž. Jurjević *et al.* (2021) provided a comparative characterization of levels of development of rural territories in Serbia and the EU based on the determination and measurement of a set of socio-economic indicators. The methodological research framework was built upon the structural justification of the socio-economic efficiency index, created through factor analysis. The authors measured the extent of development lag in rural territories of Serbia compared to other EU regions. The need for implementing strategies capable of directing the available resource potential of rural territories towards accelerating their socio-economic development was justified.

In this study, a toolkit for quantitative-structural substantiation was developed and tested, content components were determined, and a methodological algorithm for determining an integral indicator of the effectiveness of united community rural territory development was created. Structural monitoring was also conducted, and the dynamics of this indicator were studied.

## ► Conclusions

The process of assessing the level of socio-economic development of rural areas is characterized by a set of sequential operations, starting with the establishment of evaluation criteria, selection of indicators, justification of calculation methodology, and ending with analytical conclusions drawn from the obtained results. To assess the effectiveness of rural development in amalgamated territorial communities (ATGs), there is a variety of indicators and criteria, which are structured into economic, social, and ecological blocks in the context of the study and differentiated analytically into diagnostic indicators (monitoring) and criteria for development effectiveness and performance. The determination of partial indicators for the economic, social, and ecological components of rural development effectiveness allowed for the calculation and analytical measurement of the overall integral indicator, as well as an analysis of its dynamics. Throughout the analysed period, a trend of stability in the achieved level of rural development in the Vinnytsia Oblast’s ATGs was identified, although the growth dynamics proved to be relatively modest, increasing by only 2.9% (from 91.2 in 2017 to 93.9 in 2021). The maximum value of the integral indicator was

reached in 2021. The full-scale invasion by Russia prevents predicting its further positive dynamics.

Among the array of economic indicators, the greatest positive impact on the level of rural development in Vinnytsia's ATGs was caused by: an increase in agricultural production volume by 8.3 billion UAH (or 16.2%), growth in the sales volume of agricultural products by producers by 7.6 billion UAH (or 24.1%), profitability growth by 735.3 million UAH, significant increases in meat, grain, fruit, berry, and vegetable production per capita, an increase in the average monthly salary in rural agriculture, and an increase in the share of the employed population. Overall, the partial index of economic efficiency of rural development in ATGs demonstrated a positive growth trend of 3.9%.

Factor analysis revealed a negative influence of deteriorating social indicators on the overall integral indicator of rural development effectiveness. The decline in the population of the region's ATGs, the decrease in rural population per settlement, and the increase in rural mortality had a particularly negative impact. However, stability and improvement in social infrastructure indicators provide a positive basis for the future development of rural territories. Improvement includes increased access of children to preschool education, betterment of the rural housing stock, and increased gasification of rural dwellings. Regarding the dynamics of the partial index of social effectiveness of rural development in ATGs, a negative decline of 2.4% was observed during the analysed period. On the other hand, the

partial index of ecological effectiveness of rural development in Vinnytsia's ATGs grew at the highest rate, by 7.3%.

The scientific novelty lies in the further development of a methodological approach to assessing rural development effectiveness. This approach is based on a systematic toolkit of quantitative-structural substantiation and content filling of integral indicators for rural development effectiveness in Vinnytsia's ATGs, which creates prerequisites for further research and evaluation of the efficiency of territorial transformations in rural areas within individual ATGs.

The research results provide a practical opportunity to objectively assess and analyse the comparative advantages, challenges, and risks of rural development in the united territorial communities of Vinnytsia Oblast. Identified logical connections between internal and external factors contribute to determining strategic directions for further activation of these communities' development, justifying the dynamics of development effectiveness indices over the considered period, and highlighting the role and significance of objective assessment for the development of united rural communities.

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#### ► Conflict of Interest

None.

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## Моніторинг та оцінка ефективності сільського розвитку об'єднаних територіальних громад Вінницької області

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► **Анотація.** Збалансований розвиток та взаємодія видів господарської діяльності формують економічний потенціал регіону і допомагають заповнювати бюджети. Удосконалення методики діагностики економіки сільського розвитку з урахуванням природних, економічних, демографічних, соціальних та рекреаційних особливостей є актуальним. Метою дослідження було удосконалення та опрацювання методичного інструментарію оцінки ефективності сільського розвитку на прикладі об'єднаних територіальних громад Вінницької області. У процесі дослідження використано ряд методів: абстрактно-логічний, порівняльного аналізу, табличний, статистичний, розрахунково-конструктивний. За ключовими економічними параметрами, такими як темпи Вища рада правосуддя та обсяг виробництва на особу, Вінницька область відзначається відносною тенденцією випереджального регіонального розвитку, а сільське господарство області 2017-2021 рр. зберігає пріоритетні позиції в структурі агропромислового комплексу України. Аналітичний моніторинг позитивної динаміки переважної сукупності економічних індикаторів сільського розвитку об'єднаних територіальних громад Вінницької області сприяв зростанню часткового індексу економічної складової. Протягом 2017-2021 рр. даний сукупний показник збільшився від 411 до 427 пунктів або майже на 4%. Встановлено, що частковий індекс соціальної ефективності сільського розвитку об'єднаних територіальних громад області знизився на 2.4% (від 107.4 у 2017 р. до 104.8 пунктів у 2021 р.). Найвищого значення індекс соціальної ефективності сільського розвитку об'єднаних територіальних громад зазнав у 2017 р. (107.4), а найнижчого – у 2020 р. – 104.0. Розрахунок часткового індексу екологічної ефективності сільського розвитку встановив зростання на 7.3% (від 17.2 у 2017 р. до 18.5 у 2021 р.). Розрахунок та аналітичне вимірювання сукупного інтегрального показника ефективності сільського розвитку об'єднаних територіальних громад виявив тенденцію незначного зростання – від 91.2 у 2017 р. до 93.9 пунктів у 2021 р., що не перевищує 3%. Практична значущість проведеного дослідження визначається удосконаленням інструментарію та розробкою методичного алгоритму визначення інтегрального показника ефективності сільського розвитку об'єднаних територіальних громад, що може бути корисним в регіональній управлінській практиці організації моніторингу та розробки напрямів розвитку сільських територій

► **Ключові слова:** розвиток сільських територій; інтегральний показник; індекс економічної ефективності; індекс соціальної ефективності; індекс екологічної ефективності