CHAPTER 2
METHODOLOGY AND PRACTICE OF ANALYSIS AND ASSESSMENT OF FINANCIAL SUPPORT FOR SUSTAINABLE DEVELOPMENT OF THE NORTH-WESTERN REGION

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2.1. General characteristics and trends in the socio-economic development of the North-Western region

The object of further analytical research is the North-Western region of Ukraine, which includes the territories of two administrative regions – Volyn and Rivne, which are characterised by significant similarity in the size of the total area of the territory (respectively, 2014.4 thousand hectares and 2005.1 thousand hectares) and the area of individual components of the land fund (Figure 2.1).

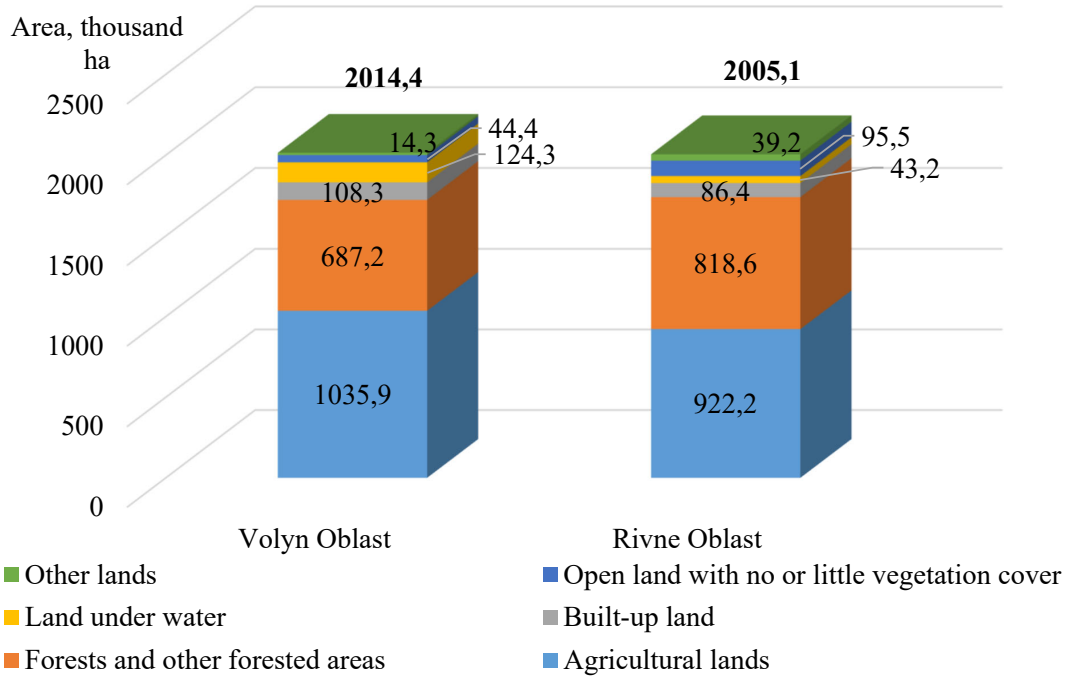

Figure 2.1. Comparison of the land area in Volyn and Rivne Oblasts (according to the State Service of Ukraine for Geodesy, Cartography and Cadastre; as of January 1, 2020), thousand hectares

Source: built by the authors according to [36; 37]

In more detail, certain differences between the components of the land fund can be traced by comparing the structure of land in these oblasts and in the region as a whole (Figure 2.2).

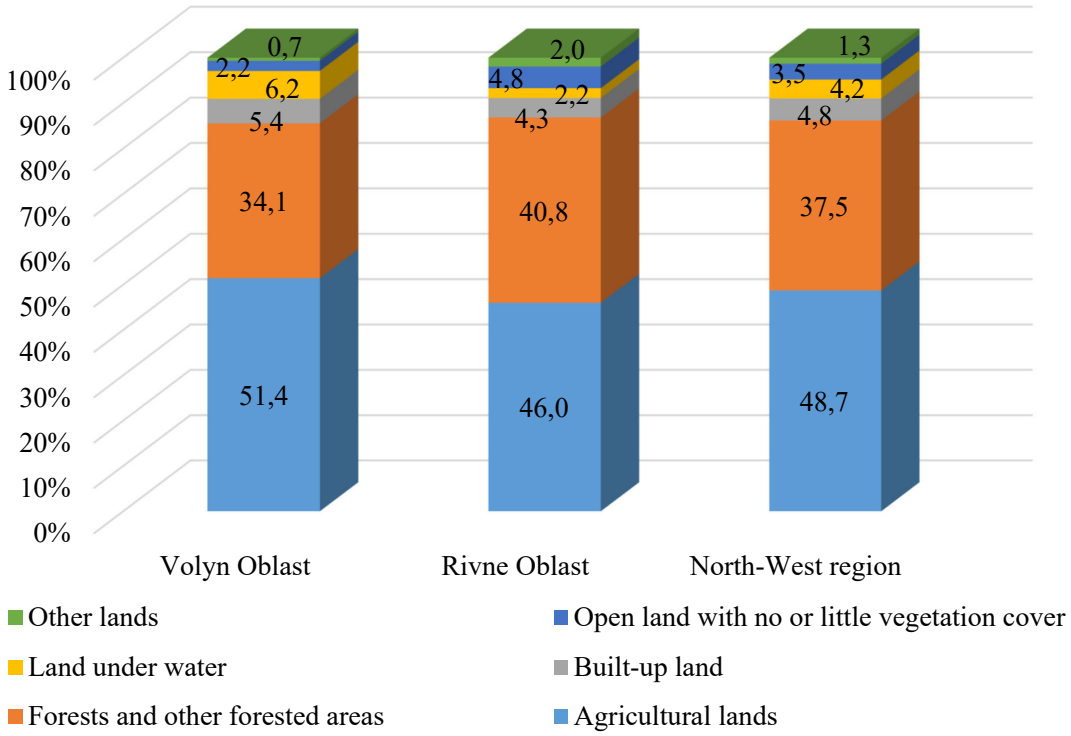

Figure 2.2. Comparison of the structure of land in the North-Western region of Ukraine (according to the State Service of Ukraine for Geodesy, Cartography and Cadastre; as of January 1, 2020), %

Source: built by the authors according to [36; 37]

As we can see, the largest area of land is covered by agricultural land (the largest in Volyn Oblast – 51.4%), and, given that these territories belong to the Polissya geographical zone, a significant share is covered by forest land (the largest in Rivne Oblast – 40.8%). The share of land under water is much smaller (the largest in Volyn Oblast – 6.2%) and the share of open wetlands (the largest in Rivne Oblast – 4.8%), while the share of built-up land and other land is relatively smaller. This structure shows that the North-West region has the basic conditions for attracting the available natural resource potential for the development of the agricultural and forestry sectors of the economy.

An important component of the Northwest region's potential is human capital, which is based on the population of the area (Figure 2.3).

In the long period from 1995 to 2022 there was a slight predominance of the permanent population in Rivne Oblast in comparison with Volyn Oblast (by 10–12%). However, in general, there was a decrease in this indicator from 2272.8 thousand people in 1995 to 2163.1 thousand people in 2022, or by 109.7 thousand people, i.e. 4.8%, which indicates a decrease in the basic indicator of human capital formation in the North-Western region. Although this indicator tended to increase during the

period 2010–2016, the crisis in the economy after Euromaidan and the occupation of the territories of Donetsk and Luhansk oblasts and the Autonomous Republic of Crimea resulted in a negative natural increase in the population of these oblasts and the region as a whole.

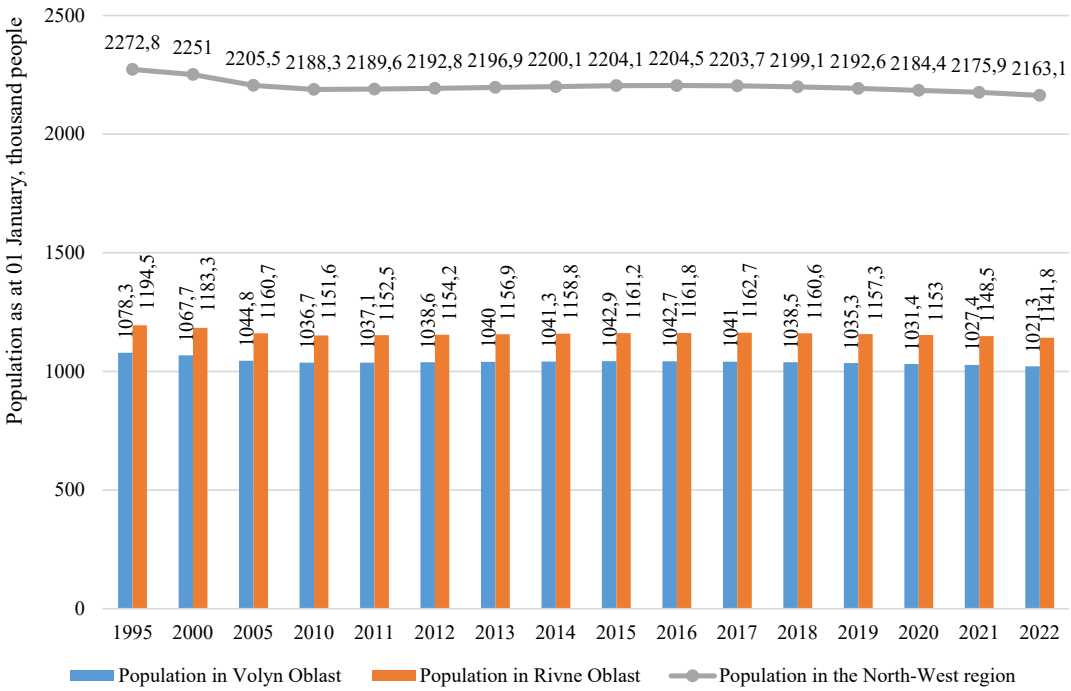

Figure 2.3. Dynamics of the population in the North-Western region of Ukraine as of January 1, 1995–2022

Source: built by the authors according to [11, 12, 16, 17, 31]

In the future, it is important to study the dynamics of the main economic indicator of socio-economic development of regions – the Gross Regional Product (GRP) (Figure 2.4), but for analytical purposes it is advisable to focus on the change in the real value adjusted for the cumulative inflation index.

As we can see, the nominal GRP in Volyn and Rivne regions increased almost constantly and more strongly, while the real GRP values after 2004 show clear downward waves of decrease during the economic crises (2008–2009 and 2015–2016). In general, however, it can be noted that in 2021, compared to 2004, real GRP increased by 2.6 times in Volyn region and by 2.3 times in Rivne region.

Accordingly, similar positive changes in this indicator occurred in the North-Western region as a whole (Figure 2.5).

At the same time, the constructed trend line for nominal GRP in the form of an exponential, which is marked by the highest value of the coefficient of determination, describes a sharp positive upward trend.

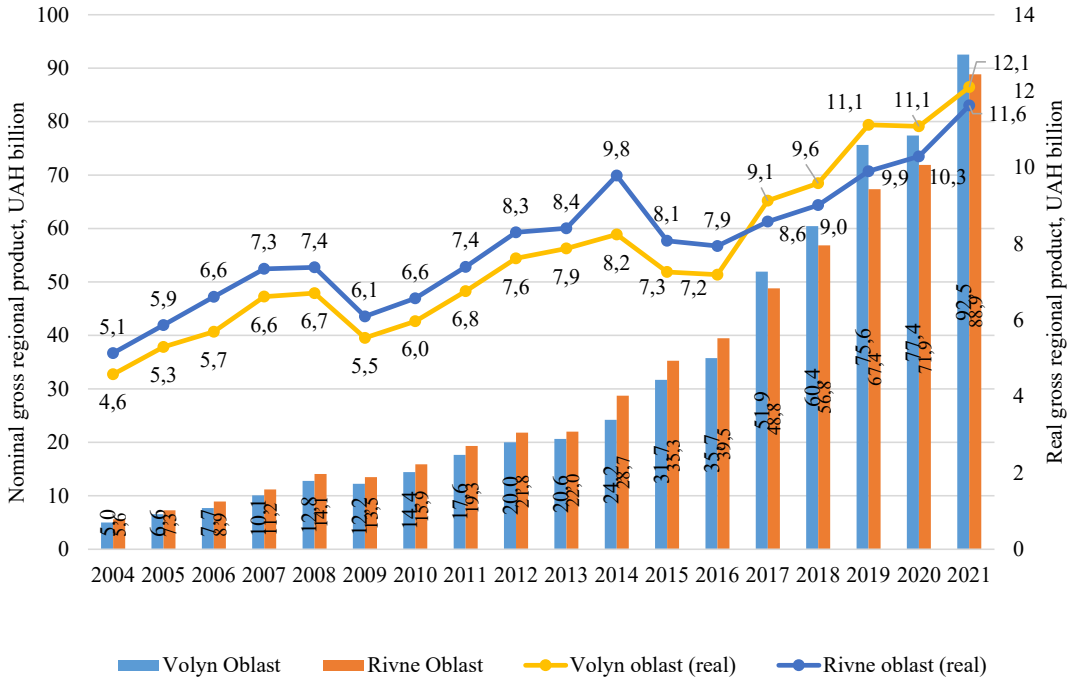

Figure 2.4. Comparison of the dynamics of nominal and real gross regional product in Volyn and Rivne Oblasts in 2004–2021

Source: compiled by the authors based on data from [11; 12; 16; 17; 31]

Whereas the trend line of real GRP in the form of a second-degree polynomial is also ascending, but indicates a very moderate growth of this indicator, which in general over the analysed period (18 years) was 2.4 times, i.e. an average annual growth rate of 5.4%. Therefore, we can make a preliminary conclusion that the economy of the North-Western region is generally growing positively, but at a moderate pace.

More detailed conclusions can be drawn on the basis of a comparative analysis of the dynamics of the main indicators of socio-economic development of Volyn and Rivne regions over the past 5 years, which are available from the point of view of official statistics, i.e. for 2017–2021 (Table 2.1).

As can be seen from the table, the number of residents in Rivne Oblast was on average 12.0% higher than in Volyn Oblast during the period analysed. Rivne Oblast also significantly outperformed Volyn Oblast in terms of the number of employed persons aged 15–70 (by 27%) and the corresponding employment rate (by 14%), and also had a relatively lower average annual unemployment rate (by 22%).

A more detailed analysis of the indices of the main indicators of economic development and individual types of economic activity shows that the Rivne Oblast also had a relatively higher level of the physical volume of gross fixed capital formation at last year's prices (by 22%), as well as the index of industrial

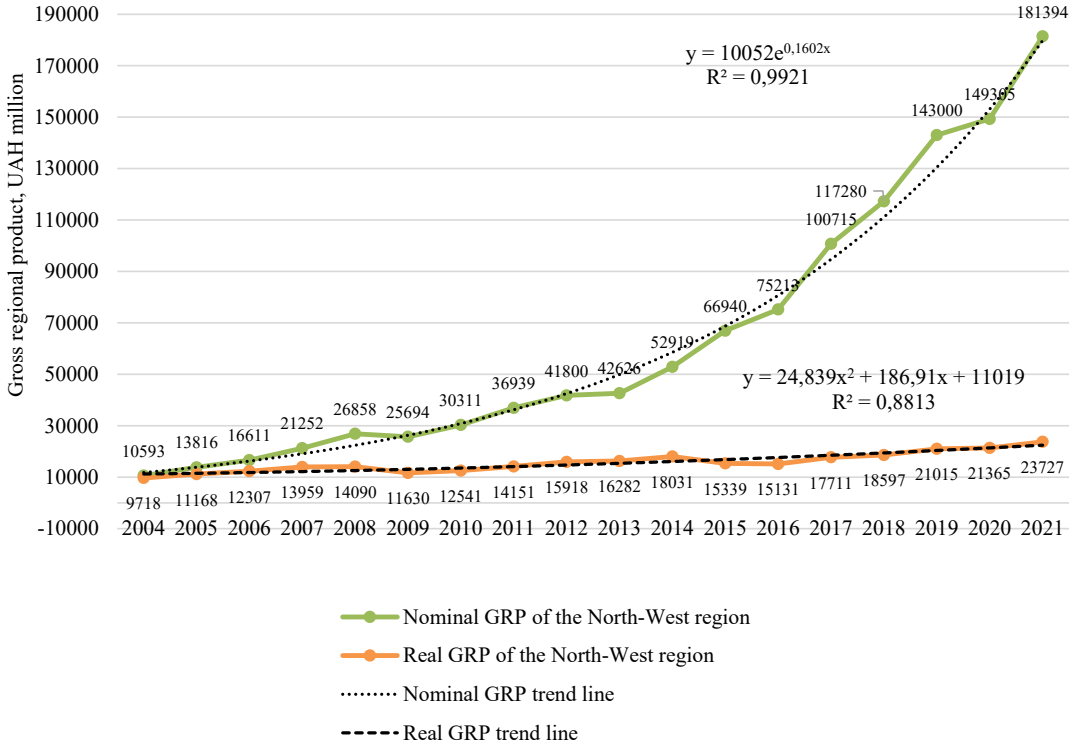

Figure 2.5. Comparison of trends in the nominal and real gross regional product of the North-Western region of Ukraine in 2004–2021

Source: compiled by the authors based on data from [11; 12; 16; 17; 31]

production (by 8%), especially the index of construction products (by 52%) and the index of the physical volume of retail trade turnover (by 16%). On the other hand, Volyn Oblast provided relatively higher growth indices for agricultural production (by 1%), changes in freight turnover (by 39%), and changes in profitability of operating activities of enterprises (by 78%). At the same time, Rivne Oblast had a slight advantage in terms of basic social indicators – the index of changes in real disposable income (by 3%) and the index of changes in real wages (by 4%).

Volyn Oblast's direct border with Poland, a member of the European Union, gives it an advantage over Rivne Oblast in both exports and imports of goods (31% and 73% respectively) and exports and imports of services (29% and 17% respectively).

In general, it can be said that the oblasts of the North-West region have shown positive dynamics in most of the basic indicators of socio-economic development, but in the future it is advisable to focus also on the reduction of imbalances in employment, development of the construction industry, changes in cargo turnover, profitability of business activities of enterprises and export-import operations of goods and services.

It is also important to study the dynamics of the labour force, employed and unemployed population in the North-Western region (Figure 2.6).

Table 2.1

Comparative analysis of the dynamics of key indicators of socio-economic development of Volyn and Rivne Oblasts in 2017–2021

Indicators	Volyn Oblast					Rivne Oblast					The average annual index comparing the values of Rivne and Volyn Oblasts for the period
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	
Resident population (end of year), thousand people	1035,7	1032,6	1028,7	1024,7	1018,6	1159,6	1156,2	1151,9	1147,4	1140,7	1,12
Number of employees aged 15-70, thousand people	366	371,1	380	364,1	360,2	460,2	473,6	486	465,8	455,2	1,27
Employment rate, in % of the population of the respective age group	48,8	49,5	50,9	48,9	48,5	55,1	56,8	58,4	56,1	55	1,14
Unemployment rate (ILO methodology), per cent	12,5	11,4	10,6	12,5	12,7	11,6	9,7	8,3	9,3	9,6	0,78
Indices of the physical volume of the gross regional product, in prices of the previous year, %	105,2	103,8	94,2	97,2	92,5	103,4	101,5	107,1	98,1	102,3	1,22
Industrial production index, % compared to preceding year	105,7	102,2	94,9	95,7	110,0	109,3	95,6	106,9	97,3	107,2	1,08
Agricultural production index in farms of all categories, % to the previous year	104,9	103,1	101,3	100,4	102,8	105,1	102,5	99,4	103,0	102,0	0,99
Construction products index, % compared to preceding year	99,0	100,7	122,4	103,7	108,4	114,4	130,9	127,3	94,5	115,6	1,52
Index of physical volume of retail trade turnover (in comparable prices), % compared to preceding year	94,2	102,4	110,4	113,7	107,6	102,7	108,5	112,0	103,7	117,0	1,16
Freight turnover change index, % compared to preceding year	109,1	117,1	106,5	104,3	113,6	106,6	93,5	95,4	93,7	109,9	0,61
Level of profitability (loss) of operating activities of enterprises, %	12,3	12,9	3,5	9,8	9,4	4,9	6,9	13,3	1,1	0,1	0,22
Real disposable income index, % compared to preceding year	110,9	108	105,6	103	102,4	112,4	107,2	107,1	102,6	103,8	1,03
Real wages index, % compared to preceding year	125,5	112,7	109,3	102,9	112,3	119,4	111,6	111,1	110,8	113,6	1,04
Exports of goods, mln. USD USA	689,3	720,0	694,0	642,9	832,5	383,3	410,9	440,2	469,4	703,9	0,69
Imports of goods, mln. USD USA	1335,4	1368,5	1456,3	1315,7	1814,4	341,2	298,8	382,6	383,0	577,0	0,27
Export of services, mln. USD USA	63,4	84,1	110,3	83,8	87,0	36,2	49,1	58,0	71,7	82,9	0,71
Imports of services, mln. USD USA	24,9	27,9	39,3	30,4	39,0	18,3	18,6	19,4	28,1	61,1	0,83

Source: compiled by the authors according to [11; 12; 16; 17; 31]

As can be seen from the figure, the region's labour force has been based on the employed population throughout the period, with fluctuations in the number of people in the region during periods of economic downturn and growth, with the most recent decline starting in 2020 due to the COVID-19 coronavirus pandemic, and further negative changes expected after 2022 as a result of a full-scale war.

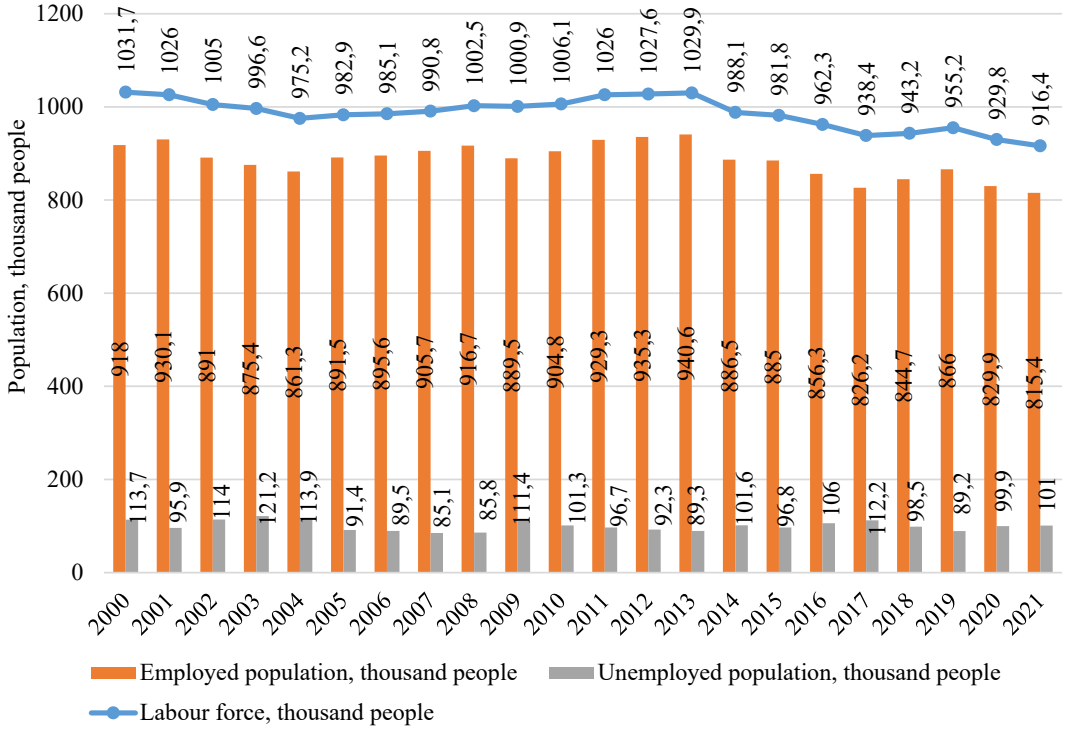

Figure 2.6. Dynamics of the labor force, employed and unemployed population (according to the ILO methodology at the age of 15–70) in the North-Western region in 2000–2021

Source: built by the authors based on data from [11; 12; 16; 17; 31]

In general, over the period 2000-2021, the labour force will decrease by 115.3 thousand people or 11.2%, including the number of employed people (by 102.6 thousand people or 11.2%) and the number of unemployed people (by 12.7 thousand people or 11.2%). It should be noted that in 2021 the number of unemployed people in the North-West region will again exceed 100 thousand, which will require the implementation of appropriate measures to ensure fuller use of the existing labour potential of the territory.

In the future, it is also advisable to study the performance of business entities in the North-Western region (Figure 2.7).

In general, this region saw an increase in sales from UAH 96.3 billion in 2013 to UAH 409.4 billion in 2021, or 4.2 times, during the period analysed. At the same

time, enterprises accounted for more than 85% of this volume, although their share gradually decreased from 88.0% in 2013 to 85.6% in 2021. This indicates the intensification of small businesses, especially individual entrepreneurs, who are beginning to play a greater role in shaping the indicators of socio-economic development in the region. At the same time, it is important that the acceleration of the development of individual entrepreneurs does not take place through the use of elements of "shadow business", but rather through the de-shadowing of trade turnover, employment, increased profitability, wages, payments to budgets of all levels, etc.

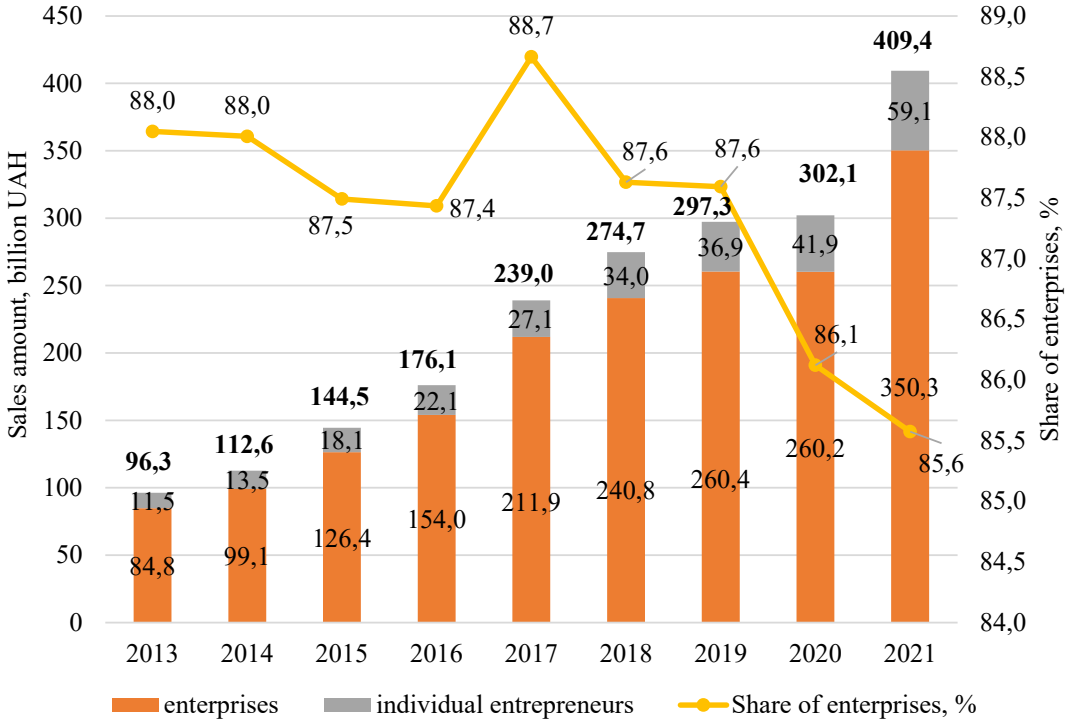

Figure 2.7. Dynamics of the volume of sales of products (goods, services) by types of business entities in the North-Western region of Ukraine in 2013–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

A more detailed analysis of the change in the net profit (loss) of enterprises by region and in the Northwest region of Ukraine in 2000–2021 (Figure 2.8) shows that the activities of enterprises in Volyn region were less unprofitable and more profitable in most periods.

The largest losses were incurred by individual regions and the region as a whole in 2014 after the economic crisis caused by the start of Russia's armed aggression – a total of UAH 14.7 billion. It is noteworthy that even during the coronavirus pandemic in 2020, Volyn Oblast made a net profit of UAH 1.9 billion, but enterprises

in Rivne Oblast suffered a loss of the same amount, which led to an overlap with the positive result for the region as a whole. Instead, in 2021 both regions achieved the largest and similar net profits in terms of the total amount (Volyn Oblast – UAH 8.8 billion, Rivne Oblast – UAH 9.0 billion).

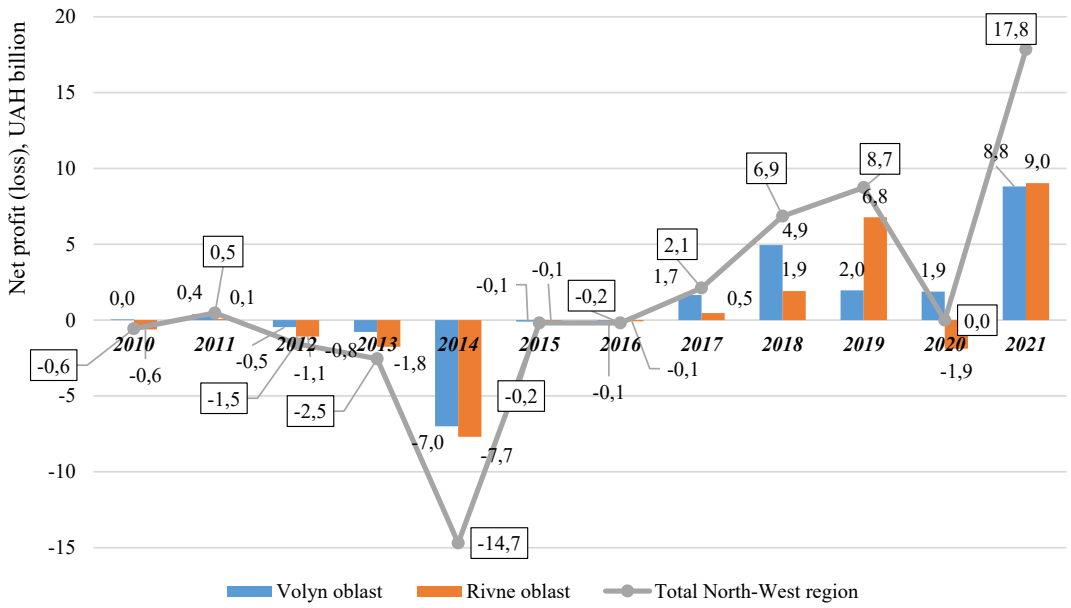

Figure 2.8. Dynamics of the net profit (loss) of enterprises by regions of the North-Western region of Ukraine for 2000–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

A more detailed analysis of changes in net profit depending on the size of enterprises in the Northwest region of Ukraine in 2015–2021 (Figure 2.9) shows that in most years, large enterprises were unprofitable, with the largest negative result in 2020 (-UAH 4.9 billion) due to the coronavirus pandemic.

On the other hand, medium-sized enterprises were profitable throughout the period analysed, with the highest net profit in 2021 (UAH 8.5 billion). Small enterprises (including micro-enterprises) were also profitable, as they only made a total loss in 2020. Obviously, after the outbreak of a full-scale war, these indicators could deteriorate significantly from 2022 onwards and even turn negative due to a significant decrease in production and sales volumes and other factors.

Given the importance of the agricultural sector for the development of this region, it is important to analyse the dynamics of agricultural production (Figure 2.10).

As can be seen, the region demonstrates a gradual increase in total agricultural output (from UAH 24.8 billion to UAH 34.7 billion, or 39.7%), which was mainly due to a gradual increase in crop production (from UAH 15.3 billion to UAH 25.9 billion, or 69.7%) and a certain decrease in livestock production (by 8.2%).

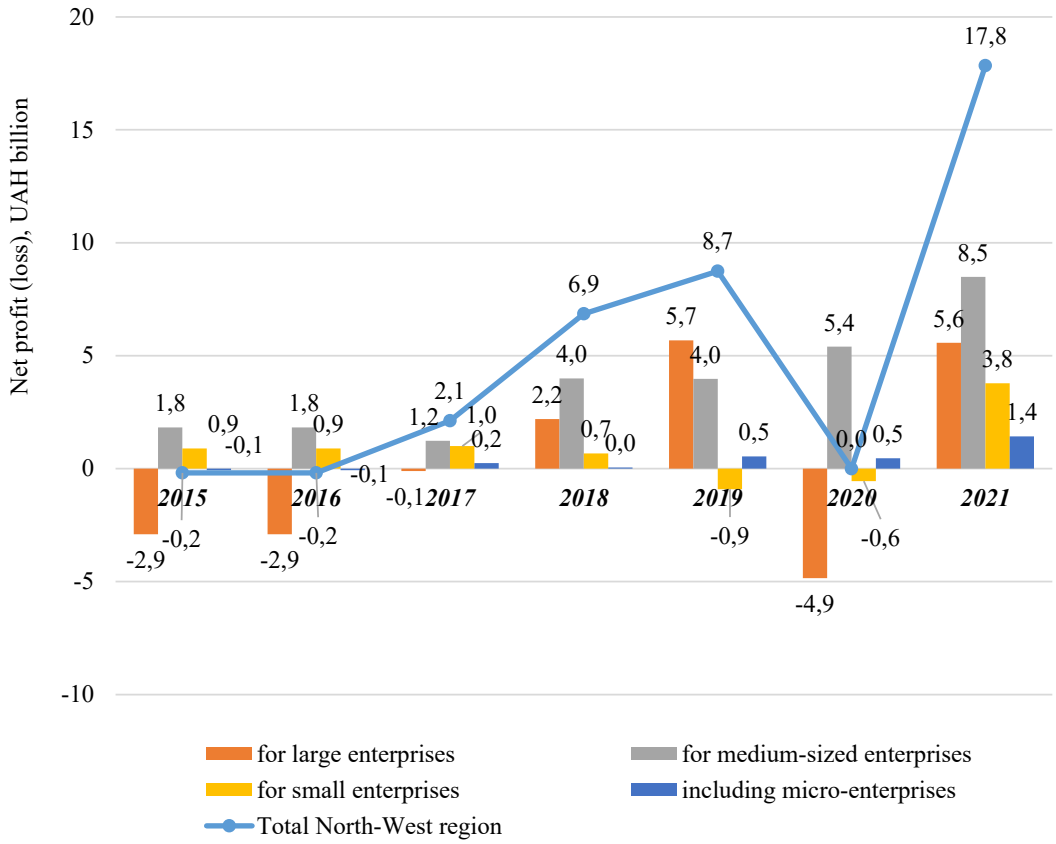

Figure 2.9. Changes in net profit (loss) depending on the size of enterprises in the North-Western region of Ukraine in 2015–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

During the period analysed, only in 2015, after the actual start of Russia's armed aggression, was there a decline in production in all sectors and in agriculture as a whole in the Northwest region. An even greater decline in these indicators can be expected at least in 2022 as a result of the outbreak of a full-scale war and the restriction of grain sales through domestic seaports.

A further analysis of changes in the structure of agricultural production by areas of activity and categories of farms in the North-Western region (Figure 2.11) showed that there was an annual increase in the share of crop production – from 61.5% to 74.7%, while the share of livestock production decreased from 38.5% to 25.3%.

On the other hand, the region experiences a shift towards large-scale agricultural production, as the share of household production decreases from 68.6% in 2010 to 46.7% in 2021, while the share of enterprise production increases accordingly, from 31.4% in 2010 to 53.3% in 2021.

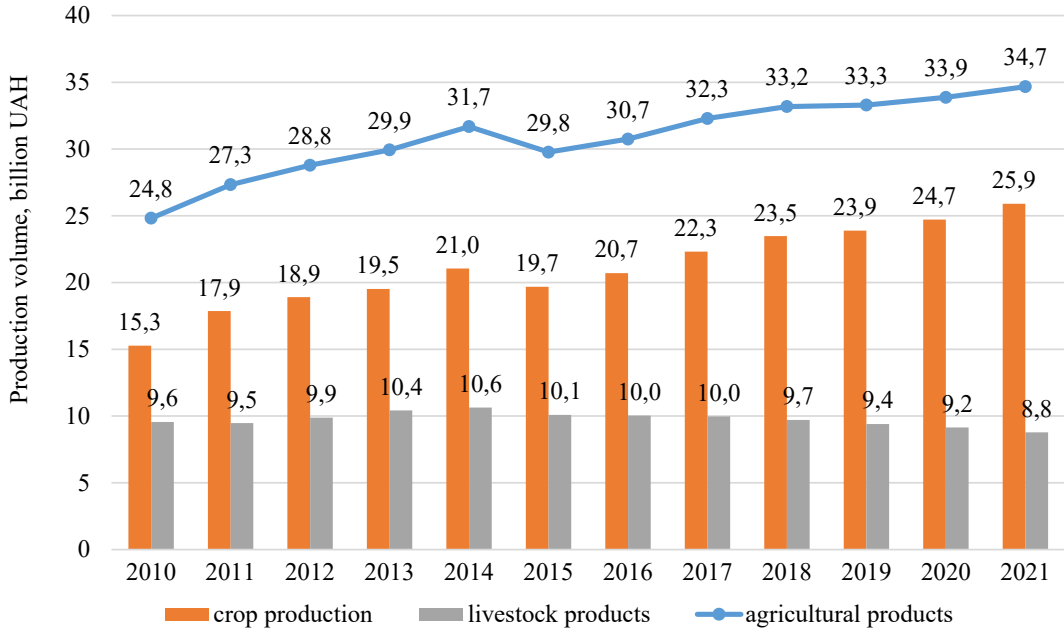

Figure 2.10. Dynamics of agricultural production in the North-Western region of Ukraine in 2010–2021, in constant prices of 2016

Source: built by the authors according to [11; 12; 16; 17; 31]

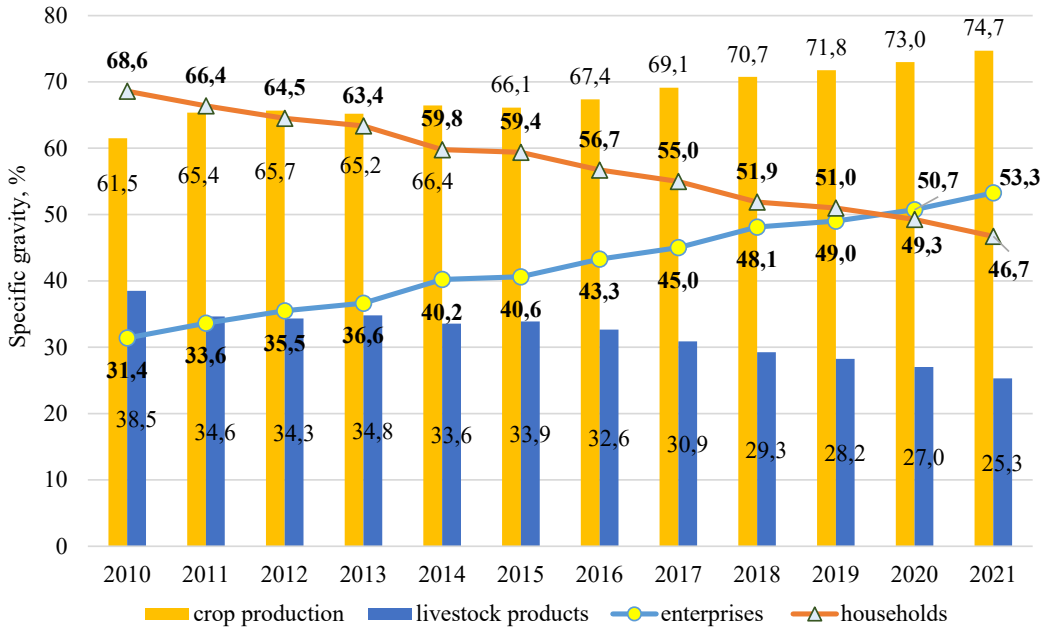

Figure 2.11. Changes in the structure of agricultural production by areas of activity and categories of farms in the North-Western region of Ukraine in 2010–2021

Source: built by the authors based on data from [11; 12; 16; 17; 31]

In other words, there has been a reorientation of the agricultural sector in this region to increase the role of large-scale production and crop production in the total output. It is also clear that in the event of a full-scale war, this structure could again change significantly, depending on external or internal factors.

2.2. Analysis of sources of attraction and areas of use of financial resources to ensure sustainable development of the region

Ensuring sustainable development of the country's regions requires adequate funding for important areas of their economic activity that will yield positive results in the short term. Promising economic areas, or macro regions of Ukraine, which have not reached a high level of development but have a favourable geographical location and significant natural resource potential, include the North-Western region, which includes Volyn and Rivne administrative oblasts. Given the low level of economic development of these regions, ensuring their growth requires attracting additional investments, especially of a capital nature. Therefore, it is important to study the current state of financial support for sustainable development in this macro-region, which will allow identifying possible reserves and justifying areas of activation in this area.

The problematic issues of financial support for sustainable development at the regional level have been studied by many scientists of well-known scientific institutions, in particular, the Institute of Environmental Economics and Sustainable Development of the National Academy of Sciences of Ukraine [70], the Academy of Financial Management [33], as well as a number of other researchers [72, 74, 75, 83].

Statistical information and individual analytical reviews on changes in investment indicators by regions of Ukraine over a long period of time are freely available on the official website of the State Statistics Service of Ukraine [31], as well as on separate official websites of the Main Department of Statistics of Volyn Oblast [16] and the Main Department of Statistics of Rivne Oblast [17]. Thus, a certain theoretical, economic and statistical basis is formed for further analysis of the trends in the indicators characterising the financial support for the achievement of the SDGs in the North-Western region of Ukraine.

In general, it can be noted that Volyn and Rivne Oblasts are quite similar both in terms of natural and climatic conditions and economic development, which allows them to be considered as a single economic region, or macro-region, which in the future, in the process of implementing administrative reform, may be allocated to a new large administrative oblast.

At the same time, these regions also have a number of differences in the size and trends in certain economic indicators, as well as in the level of development of certain sectors of the economic complex, which should also be taken into account in the analysis. Therefore, there will be a need for a comparative analysis of a number of indicators both separately for Volyn and Rivne regions and for the Northwest region as a whole.

In order to analyse the financial support for sustainable development, it is advisable to focus on the study of capital investments, since such investments form the basis of tangible and intangible long-lived assets that will form the basis for further sustainable development of the North-Western region. At the same time, it is important to take account of the time factor when examining trends in value indicators over a long period, which means that nominal indicators are adjusted each year and the inflation index is adjusted on an accrual basis from the initial year of analysis. This makes it possible to convert nominal indicators into real ones at the fictitious prices of the base year of the analysis and to ensure the comparability of the value data by removing the influence of the inflation factor.

At the initial stage of the analysis, it is advisable to compare the change in nominal and real indicators of capital investment in Volyn and Rivne Oblasts in 2010–2021 (Figure 2.12).

As can be seen from the figure, the amount of nominal investments increased annually in both Volyn and Rivne Oblasts throughout the period under study. At the same time, in Volyn Oblast the highest growth was observed in the period 2015–2019, and in the following period 2020–2021 the values were relatively lower. Instead, in Rivne Oblast, after a decline in 2019–2020, there was a sharp increase in 2021 to UAH 21.5 billion, which was the highest value among these regions in the period analysed. Until this year, the amount of investment in Volyn Oblast had consistently exceeded the corresponding figure in Rivne Oblast since 2011.

A comparison of real investment indicators at comparable prices in 2010 shows a slightly different situation, as their trends are no longer characterised by constant annual growth, but rather by cyclical changes linked to corresponding changes in economic activity in the country. In particular, it is worth noting that between 2010 and 2013 there was positive growth in the amount of investment in these regions, although not as significant as in nominal terms.

However, due to the negative effects of the economic crisis caused by the early change of government, the annexation of part of our country's territory and the ATO, in 2014 capital investment in Volyn Oblast decreased by UAH 255.9 million, or 9.1%, and in Rivne Oblast by a slightly higher UAH 283.1 million, or 11.8%. After some growth in 2015, investment in both regions fell again in 2016. At the same time, in Volyn Oblast the decline continued in 2017, but in 2019 the maximum value of this indicator for the whole period analysed was reached – UAH 4,112 million. On the contrary, in Rivne Oblast in 2019 real investments decreased to UAH 2,185 million, which is almost comparable to 2014, but in 2021 it reached the highest value of the indicator among these regions – UAH 6.2 billion, which is 1.8 times higher than in Volyn Oblast.

In other words, it can be stated that, according to realistic estimates, the volume of capital investment depends on the economic situation in the country and is unstable, but, based on the trends studied, investment activity was more active in Volyn region during the analysed period, while in Rivne region, the amount of capital investment decreased, although at the end of the period the maximum value of the indicator was

reached, so it is necessary to continue to maintain investment activity in this region at a high level.

In the future, it is also important to compare the trends in nominal and real capital investment in the North-Western region of Ukraine in 2010–2021 (Figure 2.13).

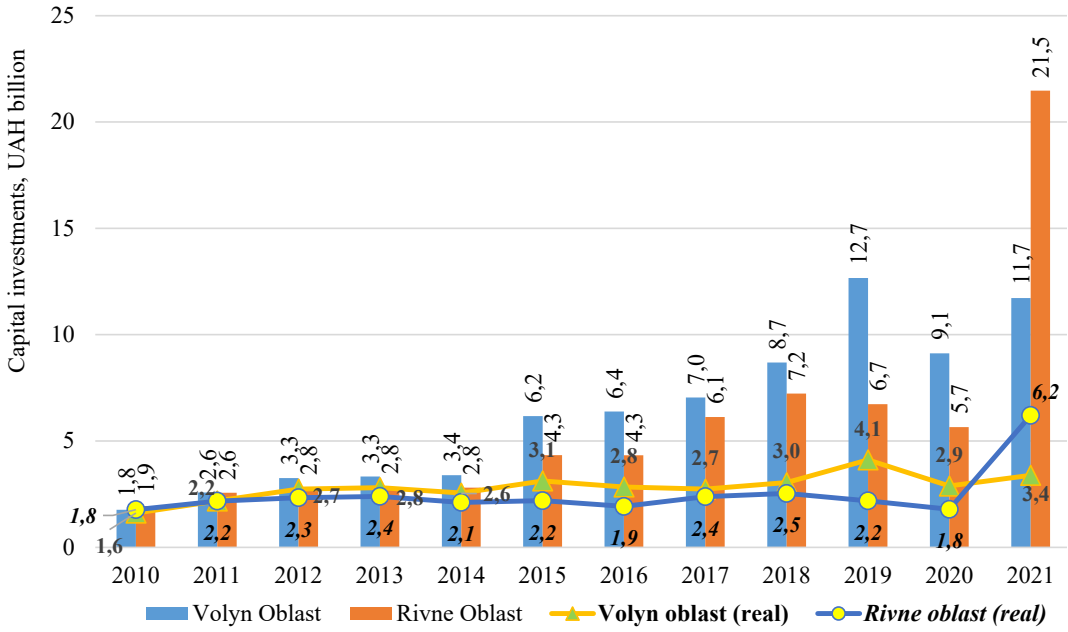

Figure 2.12. Comparison of the dynamics of nominal and real capital investment in Volyn and Rivne Oblasts in 2010–2021

Source: compiled by the authors based on data from [11; 12; 16; 17; 31]

Overall, over a long period of time, there has been a steady increase in the nominal amount of capital investments – from UAH 3704.1 million in 2010 to UAH 33187.7 million in 2021, or 9 times.

At the same time, the largest increase was observed in 2021, when this indicator increased by 2.2 times compared to the previous year, which is largely due to the improvement in the investment climate and the end of the active stage of the coronavirus pandemic, which was accompanied by economic stabilisation.

This is confirmed by the study of trends in the real amount of investments in 2010 prices, which until the crisis of 2014 had an upward trend – from UAH 3,386 million in 2010 to UAH 5,202 million in 2013, or 1.5 times, but in 2014 fell to UAH 4,663 million, or 10.4%. After a slight decline in 2016, the trend remained positive in the following years, except for a downturn in 2020, which finally allowed it to reach its maximum value for the entire period in 2021 – UAH 9,590 million, which is 2.1 times higher than in the crisis year of 2014.

In other words, according to realistic estimates, the amount of capital investment did not have such a positive increase as in nominal terms without taking into

account inflation. In general, only in 2018–2019 and 2021 did the real amount of capital investment exceed the level reached in the pre-crisis year of 2013 and reach a maximum over the entire assessment period.

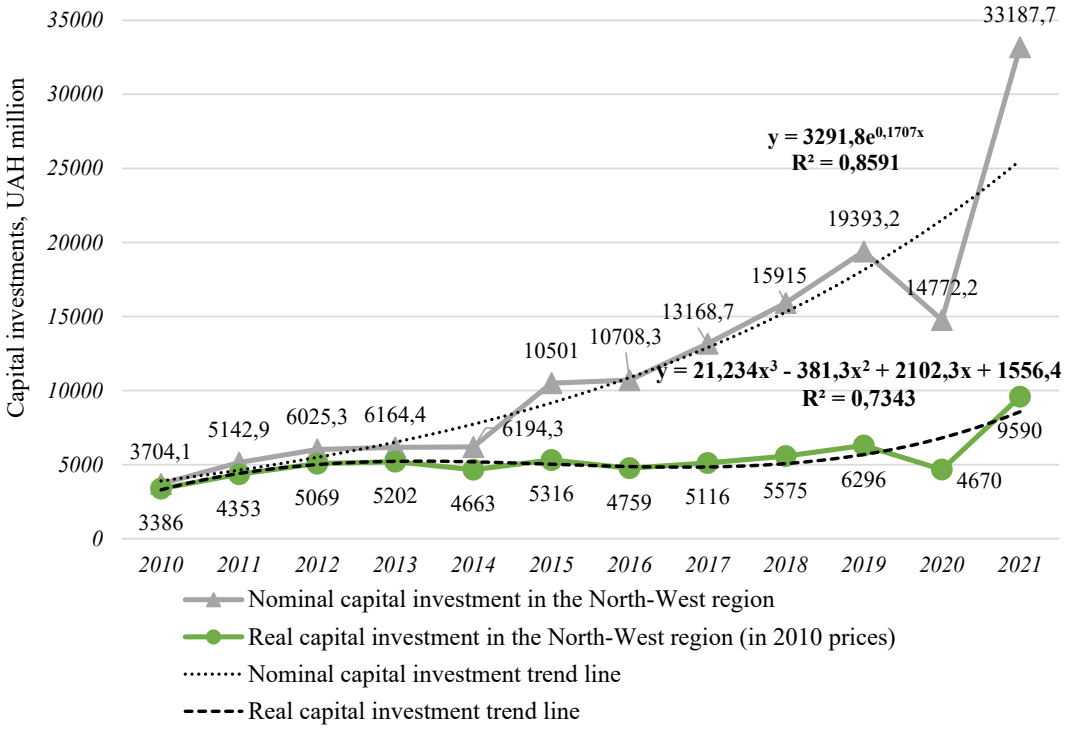

Figure 2.13. Comparison of trends in nominal and real capital investment in the North-Western region of Ukraine in 2010–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

It is also important to compare the dynamics of capital investment in the North-Western region of Ukraine during 2010–2021 by the main types of assets – tangible and intangible (Figure 2.14).

As we can see, the bulk of investments during the period under review was in tangible fixed assets, which increased from UAH 3,683.2 million in 2010 to UAH 2,857.2 million in 2021, or 7.6 times. The amount of investment in intangible assets increased much faster – from UAH 20.8 million to UAH 1,875.4 million, or 90 times – but was much smaller in terms of value. The share of investments in intangible assets throughout the analysed period ranged from 0.5-6.3%. In other words, business entities in the region pay little attention to making capital investments in intangible assets (in particular, in commercial rights, software, databases, etc.), which indicates a certain lagging behind global trends in globalisation and informatisation of the economy. Even in 2018–2019, there was a decrease in these investments compared to the maximum level reached in 2021.

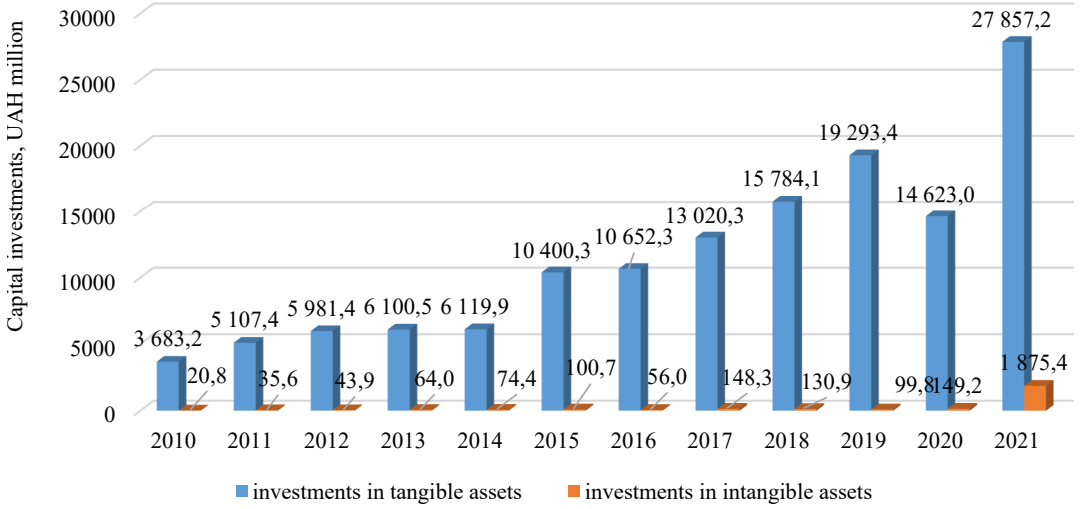

Figure 2.14. Comparison of the dynamics of capital investment in tangible and intangible assets in the North-Western region of Ukraine in 2010–2021

Source: built by the authors based on data from [11; 12; 16; 17; 31]

Along with the study of trends by type of investment, there is a need for a more detailed analysis of changes in the structure of capital investment by source of funding in the North-Western region of Ukraine in 2010–2021 (Figure 2.15).

As we can see, during the analysed period, the main source of capital investment financing was the own funds of enterprises and organisations, with their share ranging from a minimum of 43.6% in 2010 to a maximum of 63.5% in 2015, but then declining again to 37.1% in 2020. In other words, during periods of economic instability, enterprises and organisations predictably increased the share of capital investments from their own sources. The share of capital investment financing from the state budget was by far the smallest, ranging from 0.8-13.8%.

The share of investment from the local budget was somewhat higher, but also insignificant, ranging from 6.8 to 12.1%. In general, budget funds were spent mainly on investments in the non-productive sphere (health, education, culture, social services, etc.), and the amount of funding depended mainly on the economic situation in the country and the region. During the economic crisis in 2014, the share of funding from local and state budgets was minimal – 6.9% and 0.8% respectively. A similar situation was observed with respect to changes in the share of financing from loans and borrowings, which reached a minimum of 2.0% in 2015 and a maximum of 27.2% in 2020, as well as from funds from non-resident investors and other sources of financing, with a minimum of 3.1% in 2020 and a maximum of 19.9% in 2010. Fluctuations in the share of household financing for residential construction were largely dependent on the economic situation, government priorities and the interest of companies in carrying out such construction programmes on favourable terms, as it was highest in 2012, before the crisis, at 25.8%, and lowest in 2020, during the active phase of the coronavirus pandemic, at 10.8%.

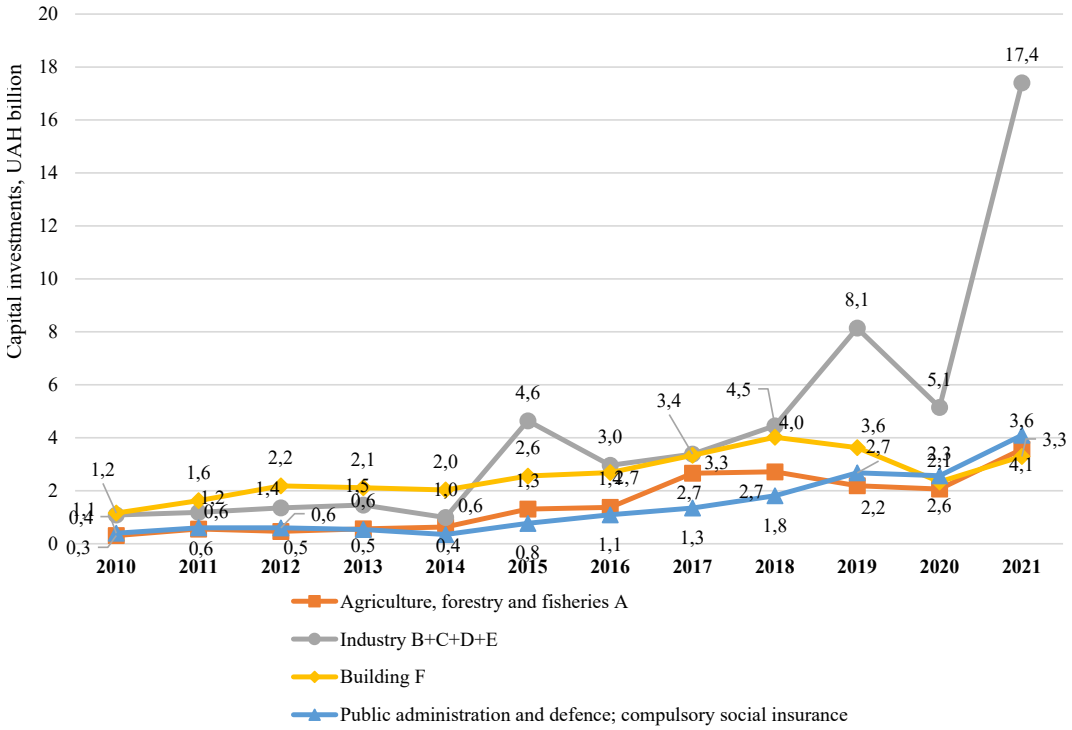

Figure 2.15. Changes in the structure of capital investments by sources of financing in the North-Western region in 2010–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

Next, we examined the dynamics of capital investment by main economic activity in the North-Western region of Ukraine in the period 2010-2021 (Figure 2.16). As we can see, the largest amount of capital investment after 2015 was in the industrial sector, which reached a maximum in 2021 – UAH 17.4 billion. The construction and agriculture, forestry and fishing sectors also received significant investments throughout the period, although their size decreased slightly in 2019–2020.

After 2014, the public administration, defence, and compulsory social insurance sectors also saw a steady increase in investment. The active phase of the pandemic also saw an increase in funding for agriculture, forestry and fisheries.

A closer look at the changes in the structure of capital investment by major economic activities (Figure 2.17) shows that there has been a gradual increase in the share of financing for industry (to 52.4% in 2021), as well as public administration and defence, and compulsory social insurance (12.3%), while the share of construction has decreased (to 9.9%).

Along with economic activity, it is important to study the state of capital investment in the field of ecology and nature management.

A more detailed analysis of the dynamics of capital investment in environmental protection in the North-Western region of Ukraine in 2010–2020 (Figure 2.18) shows that the main areas of investment were wastewater treatment, air protection and

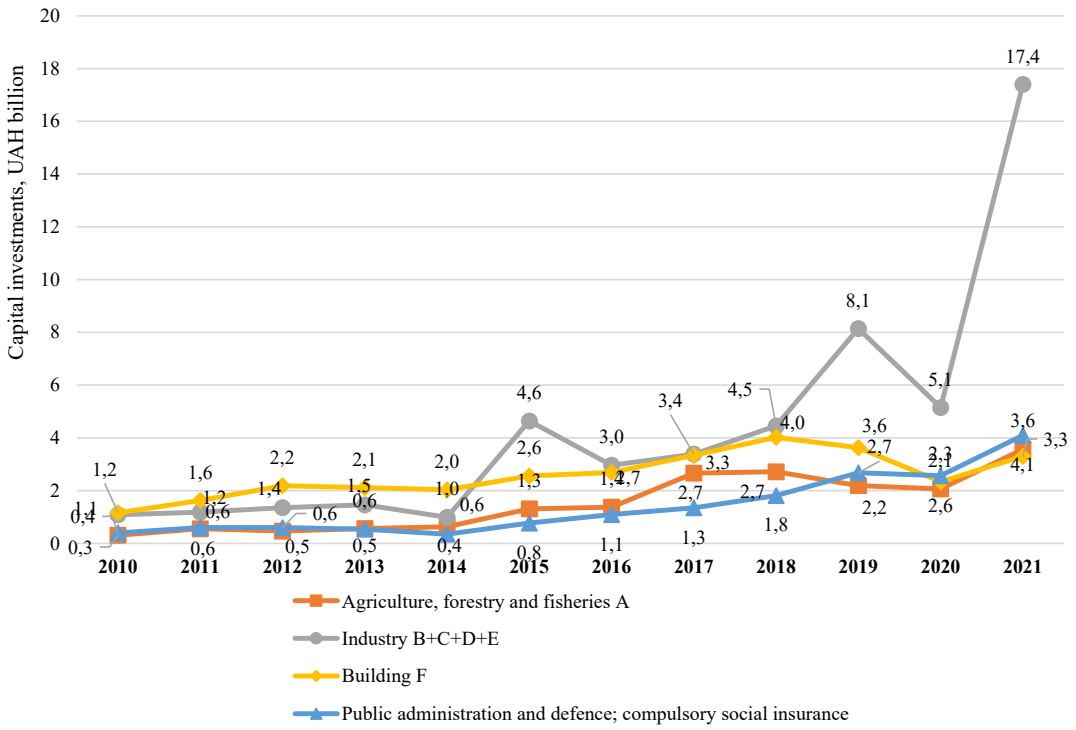

Figure 2.16. Dynamics of the amount of capital investments by main types of activity in the North-Western region of Ukraine in 2010–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

waste management, which accounted for 59.8%, 21.0% and 13.9% of funds in 2020, respectively (Figure 2.19). At the same time, the total amount of capital investments will increase from UAH 24.2 million in 2010 to UAH 83.9 million in 2021, i.e. three times, but there will be a decrease in 2012, 2014 and 2016. In general, the amount of investments in environmental protection was insignificant and amounted to only 0.3% of the total in 2021, while in 2010 this figure was slightly higher – 0.7%.

All this indicates a lack of capital investment in environmental protection activities in the Northwest region, which is quite promising in terms of using its powerful natural resource potential for economic growth.

In the context of economic instability, it is important for regions that are depressed by agricultural specialisation, underdeveloped industry, including manufacturing, and low incomes to find additional sources of financial support. An important source of mobilisation of additional financial resources for the development of the economic complex of the North-West region could be an increase in the volume of foreign investments. After all, local business entities do not have sufficient internal resources to expand existing and create new production facilities based on the use of the region's powerful natural resource potential.

As a rule, foreign direct investment takes the form of equity and debt instruments. It is important to study the trends of FDI over the past five years in economically

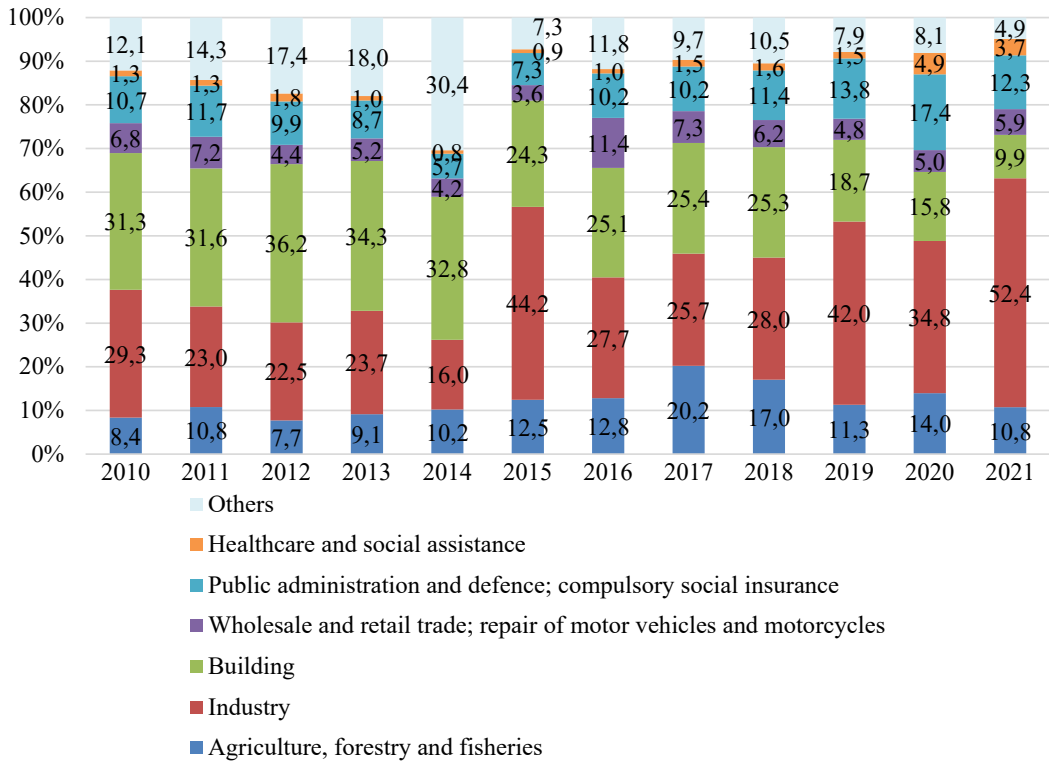

Figure 2.17. Changes in the structure of capital investments by main types of economic activity in the North-Western region of Ukraine in 2010–2021

Source: built by the authors according to [11; 12; 16; 17; 31]

underdeveloped regions with significant potential and a favourable border location, such as the regions of the North-Western Ukraine – Volyn and Rivne (Table. 2.2).

The key indicator for the analysis is the amount of growth in foreign direct investment over the period, both in general and by individual instruments – equity and debt instruments, as well as their balance at the end of the reporting period. Studying the change in these indicators in the Volyn region over the period 2015–2021, one can see negative growth, i.e. the outflow of funds previously invested by foreign investors in 2015–2016 (by USD 48.7 and USD 32.7 million, respectively) and in 2019 (by USD 41.3 million). In other words, positive growth was achieved only in 2017–2018 and 2020–2021.

But in general, during the analysed period, there was an increase in foreign investment in the economy of Volyn Oblast in the amount of USD 60 million. This is undoubtedly a positive result. At the same time, this process was mainly due to a decrease in the amount of investment through equity instruments (+ USD 106.9 million). Looking at the relevant indicators for Rivne Oblast, it can also be noted that in 2015–2017 and 2020 there was an outflow of foreign direct investment, but in the following years there was a tendency to increase its growth – from USD 27.8 million in 2018 to USD 175.3 million in 2019.

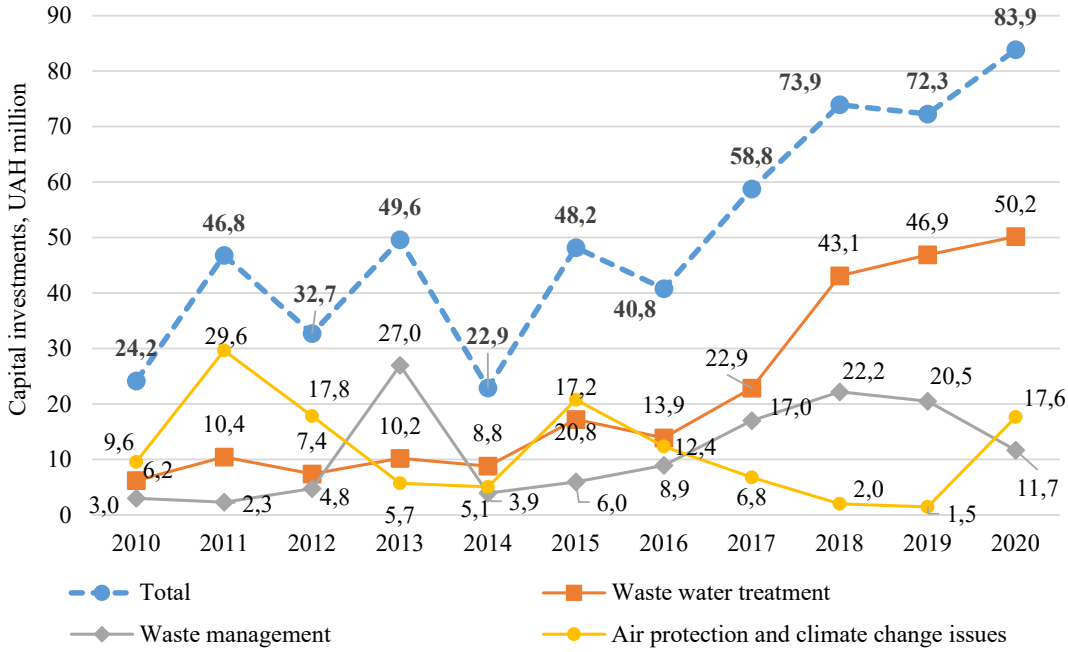

Figure 2.18. Dynamics of capital investments in environmental protection in the North-Western region in 2010–2020

Source: built by the authors according to [11; 12; 16; 17; 31]

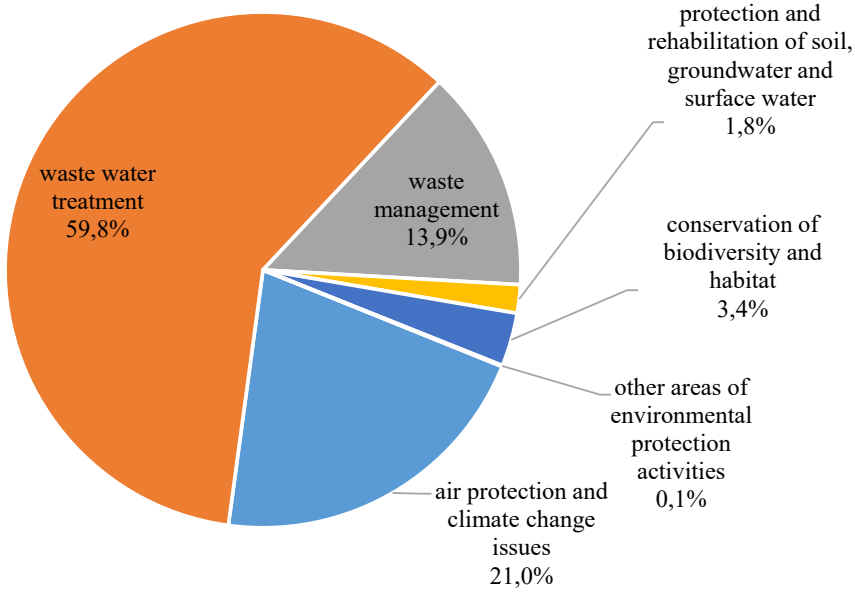

Figure 2.19. Structure of capital investment in environmental protection by type of environmental protection measures in the North-Western region of Ukraine in 2020

Source: based on data from [11; 12; 16; 17]

Table 2.2

Dynamics of foreign direct investment in Volyn and Rivne oblasts in 2015-2021, million USD USA

Indicators	2015	2016	2017	2018	2019	2020	2021	Growth in 2015-2021	
								Absol.	Relative, %
Volyn Oblast									
Foreign direct investment – total, including:	-48,7	-32,7	53,3	29,7	-41,3	50,3	49,4	98,1	-201,6
Equity instruments	-34,1	-36,9	62,7	37,7	-49,2	64,2	62,6	96,7	-283,5
Debt instruments	-14,5	4,2	-9,4	-8,0	7,8	-13,9	-13,2	1,3	-9,2
Balance of direct external investments (equity instruments) at the end of the year	219,0	225,6	239,3	225,9	323,9	247,9	376,1	157,2	71,8
including by main activities:	*184,9*	*192,9*	*202,8*	*189,8*	*273,7*	*228,1*	*246,6*	61,7	33,4
Agriculture, forestry and fishing	15,1	12,7	13,0	12,5	14,5	5,2	23,7	8,6	56,9
Manufacturing industry	169,8	180,2	189,8	177,3	259,2	222,9	222,9	53,1	31,3
Transactions with real estate	4,4	6,4	4,9	8,2	7,0	8,3	7,5	3,1	68,7
including by major countries:	*109,1*	*116,7*	*133,1*	*144,8*	*242,9*	*175,8*	*278,8*	169,7	155,5
Cyprus	13,7	24,4	37,8	39,1	122,1	123,2	207,0	193,3	1406,8
Netherlands	22,1	23,3	25,8	45,2	52,3	1,7	4,2	-17,8	-80,9
Poland	37,7	34,0	33,8	17,7	24,9	11,8	21,1	-16,6	-44,1
Switzerland	17,5	16,8	16,3	19,7	31,0	28,2	29,8	12,4	70,8
Slovakia	18,2	18,3	19,3	23,0	12,5	10,9	16,7	-1,5	-8,3
Rivne Oblast									
Foreign direct investment – total, including:	-273,5	-50,9	-26,1	28,7	175,5	-122,8	134,0	407,5	-149,0
Equity instruments	-286,1	-69,2	-18,9	36,7	167,4	-131,9	157,4	443,5	-155,0
Debt instruments	12,6	18,2	-7,1	-8,0	8,0	9,2	-23,4	-36,0	-285,7
Balance of direct external investments (equity instruments) at the end of the year	250,7	235,0	222,1	192,9	239,7	264,0	378,3	127,6	50,9
including by main activities:	*158,8*	*144,3*	*134,2*	*148,1*	*207,1*	*235,4*	*357,6*	198,8	125,2
Agriculture, forestry and fishing	15,3	4,0	2,5	2,9	1,6	1,3	12,0	-3,3	-21,7
Manufacturing industry	68,5	71,3	56,6	70,7	96,3	110,7	120,0	51,5	75,1
upply of electricity, gas, steam and air conditioning	43,9	39,5	41,7	43,3	56,2	51,8	61,8	17,9	40,8
Construction	31,0	29,4	33,4	31,3	52,9	71,7	163,7	132,7	427,9
including by major countries:	146,5	138,1	*122,2*	*133,0*	*190,5*	*217,5*	*331,9*	185,3	126,5
Cyprus	17,4	14,6	14,4	20,0	27,2	69,0	163,5	146,1	838,3
Netherlands	48,1	47,8	48,8	49,4	62,9	58,9	66,4	18,2	37,9
Poland	3,8	4,4	5,6	3,1	3,3	3,1	4,9	1,0	26,8
Germany	47,8	43,9	22,2	30,4	45,3	43,1	43,3	-4,5	-9,4
Italy	29,3	27,4	31,3	30,0	51,8	43,4	53,8	24,5	83,6

Note. Built by the author according to the National Bank of Ukraine [58]

However, this did not ensure an overall positive effect for the entire period analysed, 2015–2021, as there was a total decrease of USD 135.0 million. At the same time, the decrease in equity instruments was even greater, at USD 144.6 million, while the amount of investments in debt instruments increased by USD 9.5 million.

If we analyse the balance of foreign direct investment (equity instruments) at the end of the year in Rivne Oblast, we see that this indicator, as in Volyn Oblast, tends to increase – from USD 205.7 million in 2015 to USD 378.3 million in 2021, or 1.5 times. That is, the studied indicators clearly show that there has been a positive growth of foreign capital in the economies of Volyn and Rivne Oblasts.

It is important to study the dynamics of the amount of growth and balance of foreign direct investment in the economy of the North-Western region of Ukraine in 2015–2021 (Figure 2.20).

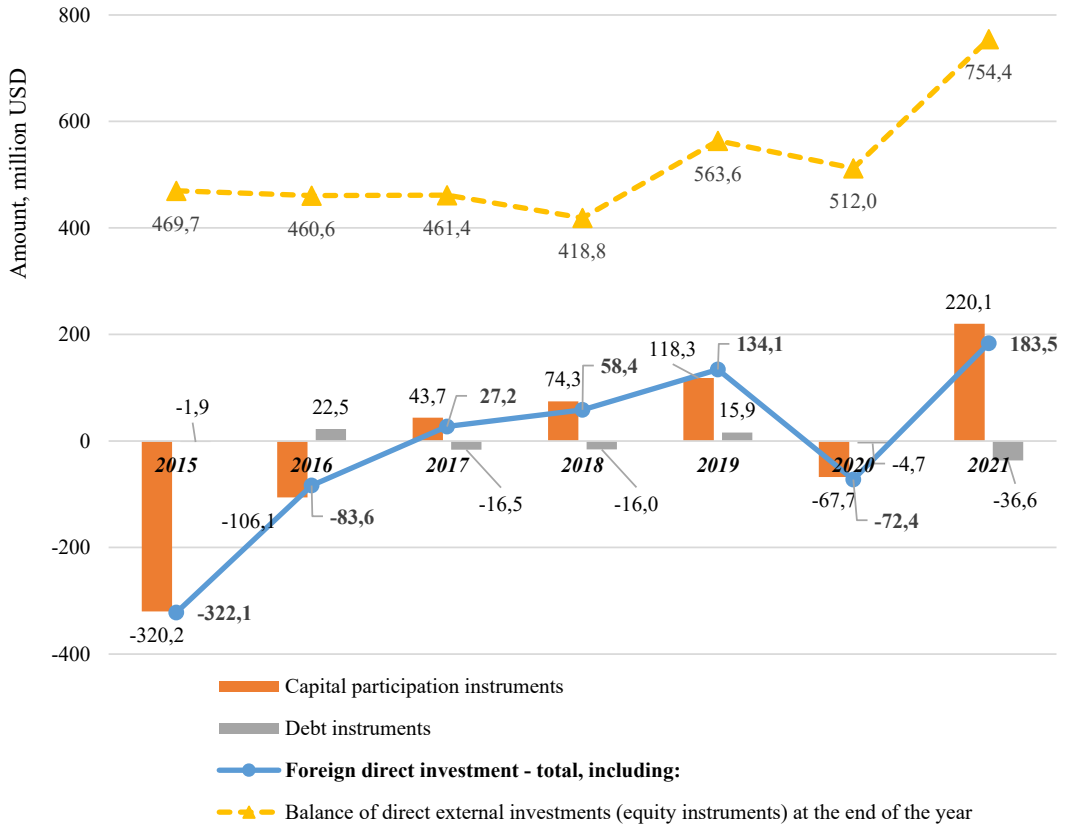

Figure 2.20. Dynamics of the amount of growth and balance of foreign direct investment in the economy of the North-Western region of Ukraine in 2015–2021

Source: built by the authors on the basis of data from [58]

The total amount of foreign direct investment will gradually increase over the years, from a negative value of USD 320.2 million in 2015 to a positive

value of USD 183.5 million in 2021. This was achieved due to a decrease in the growth of investments in equity instruments in this period – from an outflow of USD 320.2 million to an increase of USD 220.1 million. At the same time, the amount of investments in debt instruments was relatively insignificant and fluctuated both downward and upward, with capital outflows of USD 36.6 million in 2021

An analysis of the change in the balance of foreign direct investment (equity instruments) at the end of the year in the North-Western region as a whole shows that it remained somewhat stable at around USD 460 million in 2015–2017, followed by a decline in 2018 to USD 418.8 million and a resumption of growth to USD 754.4 million in 2021, the highest for the entire period. This indicates a certain recovery in the investment attractiveness of the region by foreign investors after the coronavirus pandemic. However, with the outbreak of a full-scale war, we should expect a further decline in foreign investment activity in this region.

Another important source of financial support for the implementation of the Sustainable Development Goals is the funds of local budgets. Therefore, at the initial stage, it is important to study the dynamics of consolidated local budget revenues and the level of their self-sufficiency (Figure 2.21).

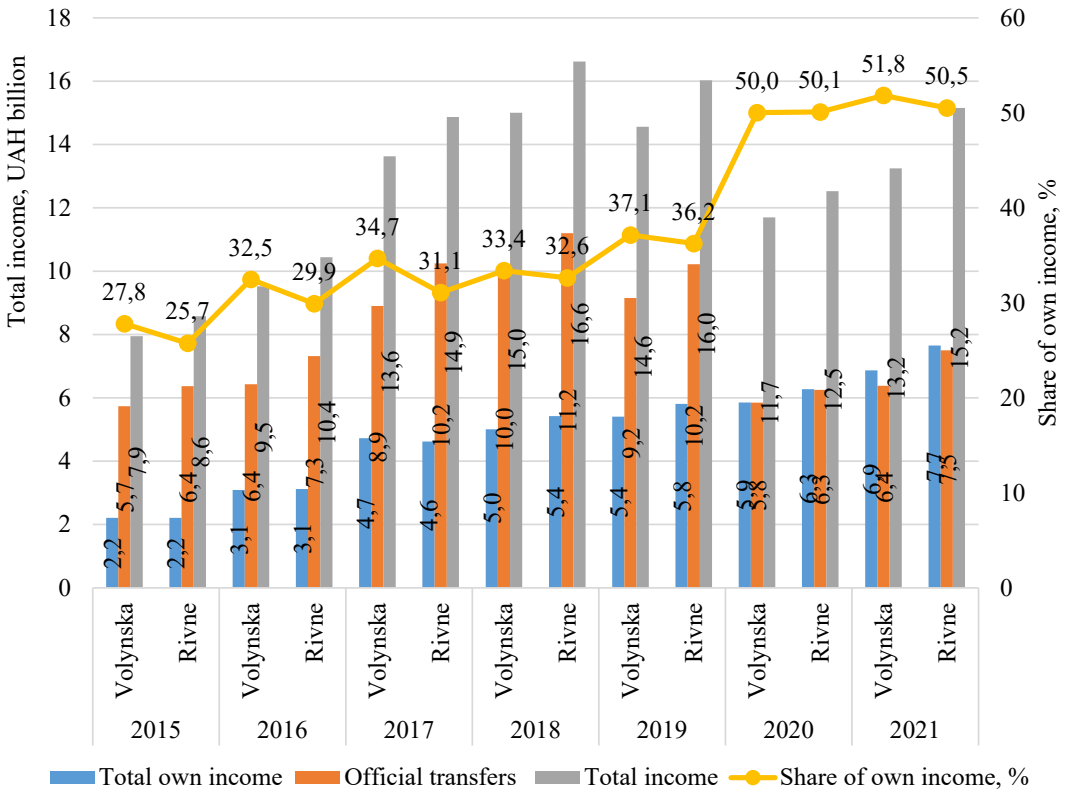

Figure 2.21. Comparative analysis of revenues and the level of self-sufficiency of consolidated local budgets of Volyn and Rivne Oblasts for 2015–2021

Source: compiled by the authors based on data from [16; 17; 71]

As we can see, Rivne Oblast slightly dominated the total amount of income throughout the analysed period, in particular, this was also true for own income and official transfers. Instead, Volyn region demonstrated higher values by 1–4% in terms of the share of own income, but by 2020 the total share did not exceed 37.1%. At the same time, with the outbreak of the coronavirus pandemic in 2020–2021, there was a decrease in transfers from the state budget, so the share of own revenues increased to 50.0–51.8%, which is a positive development.

In the future, it will be important to conduct a more detailed analysis of the revenues of the consolidated local budgets of Volyn Oblast (Appendix B.1) and Rivne Oblast (Appendix B.3), as well as of the North-Western Region as a whole, for the period 2015–2021 (Table 2.3).

When analysing the budget revenues of Volyn Oblast separately, the growth index of own revenues (3.1 times) was positively higher than total revenues (1.7 times), which was mainly due to the accelerated growth of tax revenues (3.8 times). The situation was similar in Rivne Oblast, where own revenues grew at a higher rate than total revenues (3.5 times and 1.8 times, respectively), in particular due to accelerated growth in tax revenues (3.9 times).

Accordingly, the North-Western region as a whole experienced an accelerated increase in own revenues (3.3 times) along with an increase in total revenues (1.7 times), which was due to a significant increase in tax revenues (3.8 times), in particular due to a significant increase in personal income tax revenues (4.5 times), which was due to an increase in the percentage of its distribution to local budgets. In addition to this tax, the largest amount of revenue came from other local taxes and fees (UAH 2.9 billion). The amount of official transfers increased during the period under study, despite inflationary changes, until 2020, but since the beginning of the coronavirus pandemic, due to a decrease in business activity, it has decreased again to the level of 12–13 billion UAH.

Looking ahead, it is important to analyse the change in the structure of the main revenue items of local budgets in the North-Western region (Figure 2.22).

As can be seen, there is a gradual positive increase in the share of own revenues from 21.1% in 2015 to 46.7% in 2021, while the share of official transfers decreased from 73.3% to 48.9%, indicating an increase in the independence of local budgets in the region. The share of non-tax revenues remains insignificant (3-5%), and capital gains are minimal (0.3–0.5%).The next step is to study the dynamics of consolidated budget expenditures separately in Volyn (Annex B.2) and Rivne (Annex B.4) oblasts, as well as in the North-Western region as a whole, by item of expenditure for 2015-2021 (Table 2.4).

If we look at the Volyn region separately, the total expenditure of the region increased by 1.7 times in 2015–2021, but the situation differed significantly in some general items. After all, there was a significant increase in spending on public administration (4.5 times), education (3 times), physical culture and sport (3 times), and among the most significant positive changes was an increase in spending on economic activity (4.3 times), especially on transport, road infrastructure, communications, telecommunications and informatics (7.6 times). Other positive aspects include an increase in expenditures for the protection of the population and territories from man-made and natural emergencies (4.7 times).

Table 2.3

Dynamics of revenues of the consolidated budget of the North-Western region by items in 2015–2021

Articles	2015	2016	2017	2018	2019	2020	2021	Growth index				
								2018 / 2017	2019 / 2018	2020 / 2019	2021 / 2020	2021 / 2015.
Tax revenues	**3481,887**	**5218,1635**	**8064,3**	**8701,3**	**10076,7**	**10934,4**	**13261,1**	**1,08**	**1,16**	**1,09**	**1,21**	**3,81**
tax and personal income tax	2026,4	3049,1	4450,0	5618,3	6735,0	7384,8	9079,2	1,26	1,20	1,10	1,23	4,48
corporate income tax	66,8	79,4	84,7	107,1	117,9	129,7	181,6	1,26	1,10	1,10	1,40	2,72
rent and fees for the use of other natural resources	111,4	131,5	121,4	173,6	197,6	224,3	236,4	1,43	1,14	1,14	1,05	2,12
domestic taxes on goods and services	413,2	619,0	690,6	693,8	651,2	714,5	830,6	1,00	0,94	1,10	1,16	2,01
local taxes and fees	741,4	1201,5	1541,3	1886,5	2346,7	2456,8	2909,9	1,22	1,24	1,05	1,18	3,93
other taxes and duties	122,8	137,7	1176,3	222,0	28,3	24,3	23,4	0,19	0,13	0,86	0,96	0,19
Non-tax revenues	**863,4**	**908,2**	**1191,1**	**1570,7**	**1004,8**	**914,1**	**1096,3**	**1,32**	**0,64**	**0,91**	**1,20**	**1,27**
income from property and business activities	10,5	65,3	128,0	112,7	36,3	42,6	61,6	0,88	0,32	1,17	1,45	5,87
administrative fees and charges, income from non-commercial business activities	137,6	159,3	193,7	234,2	232,3	195,8	225,9	1,21	0,99	0,84	1,15	1,64
other non-tax revenues	75,1	46,3	65,0	101,0	83,0	96,0	70,5	1,55	0,82	1,16	0,73	0,94
own revenues of budgetary institutions	640,3	637,2	804,4	1122,8	653,2	579,7	738,3	1,40	0,58	0,89	1,27	1,15
Income from capital transactions	**65,8**	**79,9**	**83,6**	**88,1**	**120,4**	**153,1**	**152,1**	**1,05**	**1,37**	**1,27**	**0,99**	**2,31**
Official transfers from the European Union, foreign governments, international organisations, donor agencies	**0,0**	**0,0**	**0,0**	**63,5**	**7,7**	**116,6**	**6,6**	**-**	**0,12**	**15,14**	**0,06**	**-**
Trust funds	**6,3**	**8,5**	**8,1**	**8,6**	**7,2**	**7,4**	**5,6**	**1,06**	**0,84**	**1,03**	**0,76**	**0,89**
Total own revenues	**4 417,4**	**6 214,8**	**9 347,1**	**10 432,2**	**11 216,8**	**12 125,6**	**14 521,7**	**1,12**	**1,08**	**1,08**	**1,20**	**3,29**
Official transfers from public administration	**12 105,9**	**13 747,8**	**19 149,3**	**21 189,4**	**19 370,3**	**12 098,1**	**13 878,0**	**1,11**	**0,91**	**0,62**	**1,15**	**1,15**
including: subsidies	799,3	774,4	1887,9	2273,9	2402,2	2161,1	2321,9	1,20	1,06	0,90	1,07	2,91
subventions	11306,6	12973,4	17261,4	18915,5	16968,1	9937,0	11556,1	1,10	0,90	0,59	1,16	1,02
Total income	**16 523,3**	**19 962,6**	**28 496,4**	**31 621,6**	**30 587,1**	**24 223,7**	**28 399,7**	**1,11**	**0,97**	**0,79**	**1,17**	**1,72**

Note. Built by the authors based on data from [16; 17; 71].

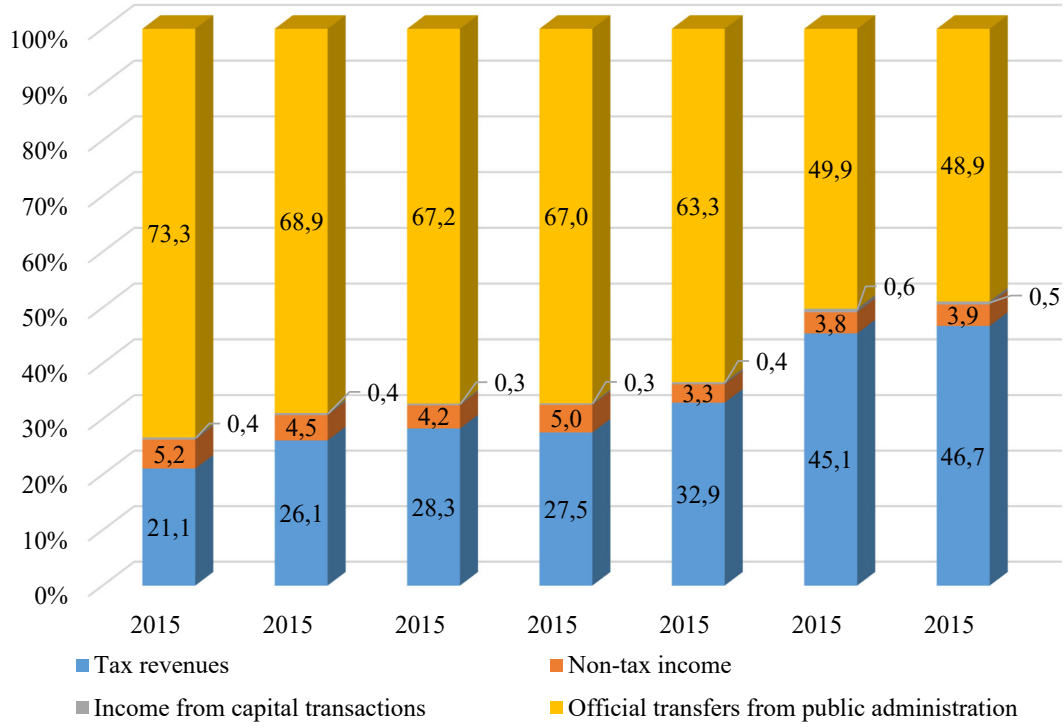

Figure 2.22. Changes in the share of revenue items in consolidated local budgets of the North-Western region in 2015–2021

Source: based on data from [71]

Considering Rivne Oblast, we can note an analytical increase in total expenditures by 1.7 times. Also noteworthy is the significant increase in expenditures on public administration (4.4 times), physical culture and sports (4.5 times), education (3.1 times), and housing and communal services (3.2 times). A significant increase in spending on economic activities (5 times), in particular on transport, road infrastructure, communications, telecommunications and informatics (7.5 times), should also be considered a significant positive development.

Similar trends were typical for the budget of the North-Western region as a whole, as total expenditures increased by 1.7 times. While the largest increases in funding were provided by the following categories: public administration (4.5 times), physical culture and sports (3.8 times), education (3.1 times), housing and communal services (3.1 times), and mainly for economic activities (4.6 times).

As for the financing of other activities, a positive development was a significant increase in funding for the prevention and elimination of emergencies and the consequences of natural disasters (by 6.3 times). At the same time, due to the reforms in the financing of healthcare and social benefits, the financing of healthcare through local budgets significantly decreased during the analysed period (by 2.6 times), as well as social protection and social security (by 5.2 times). Expenditures on agriculture, forestry, fisheries, and hunting also declined steadily (by 4.3 times).

Table 2.4

Dynamics of Consolidated Budget Expenditures of the North-Western region by item of expenditure in 2015–2021

Articles	2015	2016	2017	2018	2019	2020	2021	Growth index				
								2018 / 2017	2019 / 2018	2020 / 2019	2021 / 2020	2021 / 2015
Public administration	494,1	600,2	950,2	1346,9	1654,8	1989,2	2204,5	1,42	1,23	1,20	1,11	4,46
Education	5287,4	5748,4	8327,8	10655,9	11983,2	13113,4	16279,6	1,28	1,12	1,09	1,24	3,08
Healthcare	2952,7	3065,4	4310,2	4693,4	4337,2	2159,0	1117,5	1,09	0,92	0,50	0,52	0,38
Social protection and social security	5119,2	7300,7	9579,9	9727,1	7155,3	890,5	980,0	1,02	0,74	0,12	1,10	0,19
Culture and art	557,6	584,9	806,9	694,1	790,4	789,4	914,8	0,86	1,14	1,00	1,16	1,64
Physical culture and sports	133,6	164,0	224,9	324,6	369,9	323,2	508,7	1,44	1,14	0,87	1,57	3,81
Housing and utilities	495,3	502,6	842,6	970,5	1014,6	1033,7	1537,2	1,15	1,05	1,02	1,49	3,10
Economic activity	824,4	1430,5	2151,7	3184,1	3095,2	3491,7	3785,2	1,48	0,97	1,13	1,08	4,59
construction	386,8	553,8	651,4	927,4	1328,6	1286,3	1175,3	1,42	1,43	0,97	0,91	3,04
Agriculture and forestry, fishing and hunting	71,1	83,4	109,7	18,7	25,5	19,2	16,7	0,17	1,36	0,75	0,87	0,23
transport, road construction, communications, telecommunications and informatics	294,9	671,2	1231,4	1997,7	1418,9	1756,5	2235,6	1,62	0,71	1,24	1,27	7,58
other services related to economic activity	71,6	122,1	159,1	240,3	322,2	429,7	357,6	1,51	1,34	1,33	0,83	4,99
Other activities	181,1	124,2	193,6	85,4	147,0	121,1	145,1	0,44	1,72	0,82	1,20	0,80
environmental protection and nuclear safety	11,5	6,6	3,0	28,4	76,5	29,4	30,9	9,45	2,69	0,38	1,05	2,69
prevention and elimination of emergencies and the consequences of natural disasters	11,5	11,5	18,4	41,7	48,8	75,5	72,9	2,27	1,17	1,55	0,97	6,33
debt servicing	0,1	0,1	0,1	1,2	4,5	4,7	14,0	18,58	3,75	1,04	2,98	126,93
trust funds	21,0	28,7	40,2	0,0	0,0	0,0	4,5	0,00	-	-	-	0,21
law enforcement and state security	14,8	16,2	25,1	7,1	13,9	7,7	9,3	0,28	1,96	0,55	1,21	0,63
mass media	8,0	8,0	7,4	7,0	3,3	3,4	4,7	0,95	0,47	1,03	1,38	0,59
expenditures not included in the main groups	114,2	53,1	99,5	0,0	0,0	0,4	8,8	0,00	-	-	22,00	0,08
Total expenditure	**16045,3**	**19520,9**	**27387,8**	**31 682,0**	**30 547,6**	**23 911,2**	**27472,6**	**1,16**	**0,96**	**0,78**	**1,15**	**1,71**
Intergovernmental transfers	80,8	104,1	133,3	216,3	306,1	359,5	419,1	1,62	1,42	1,17	1,17	5,19
Total expenditures with transfers	**16126,1**	**19625,0**	**27521,1**	**31 898,3**	**30 853,7**	**24 270,7**	**27 891,7**	**1,16**	**0,97**	**0,79**	**1,15**	**1,73**
Lending	9,6	14,3	16,0	10,5	11,2	18,4	7,1	0,66	1,07	1,64	0,39	0,74
Balancing result: deficit (-), surplus (+)	***387,6***	***323,4***	***959,3***	***-287,2***	***-277,8***	***-65,4***	***500,9***	***-0,30***	***0,97***	***0,24***	***-7,66***	***1,29***

Note. Built by the authors based on data from [16; 17; 71].

These changes are also confirmed by an analysis of changes in the structure of expenditure in the consolidated local budgets of the North-Western region (Figure 2.23).

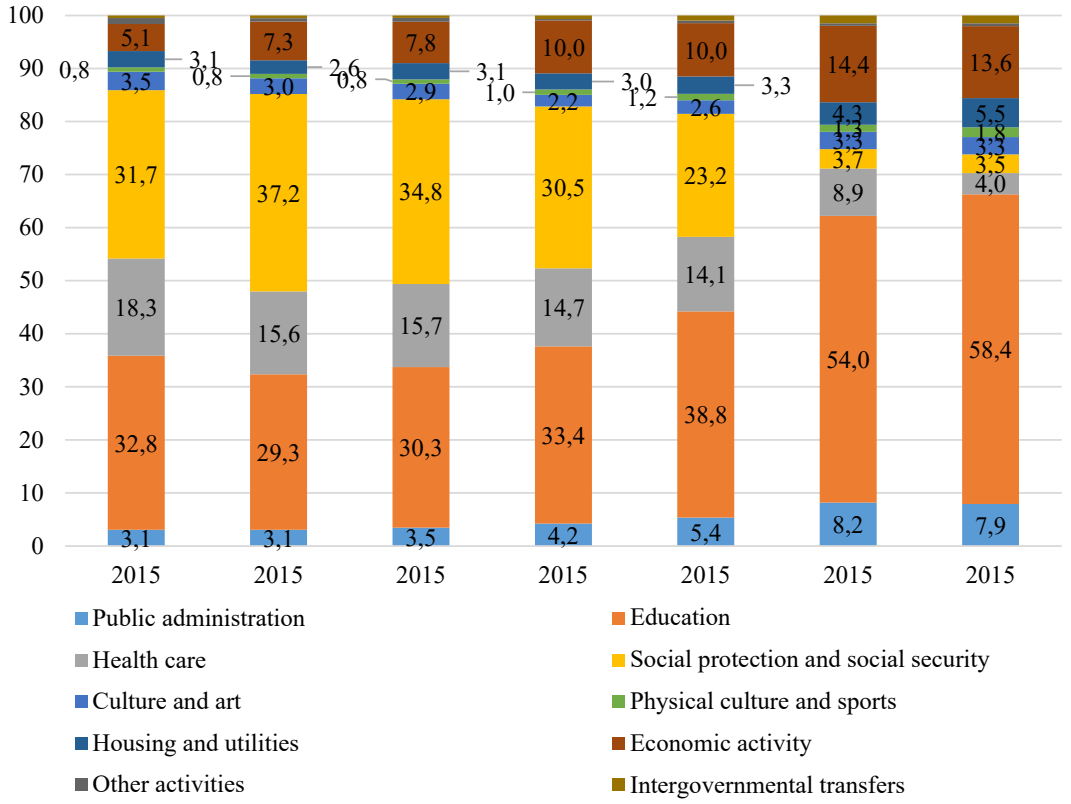

Figure 2.23. Changes in the share of expenditure items in the consolidated local budgets of the North-Western region in 2015–2021

Source: based on data from [16; 17; 71])

As can be seen, the share of education in total expenditure increased from 32.8 per cent to 58.4 per cent, and the second largest expenditure was on economic activity (from 5.1 per cent to 13.6 per cent). At the same time, the share of expenditure on social protection and social security (from 31.7% to 3.5%) and health (from 18.3% to 4.0%) decreased significantly.

Thus, in general, it can be noted that the consolidated local budgets were focused on addressing educational, physical culture, housing and communal, transport, road and security issues in the region. Certain negatives include a significant increase in expenditures on the maintenance of the state administration apparatus, as well as a decrease in expenditures on social protection.

A more detailed analysis of the financial sustainability indicators of the consolidated local budgets of the Northwest region was conducted (Figure 2.24).

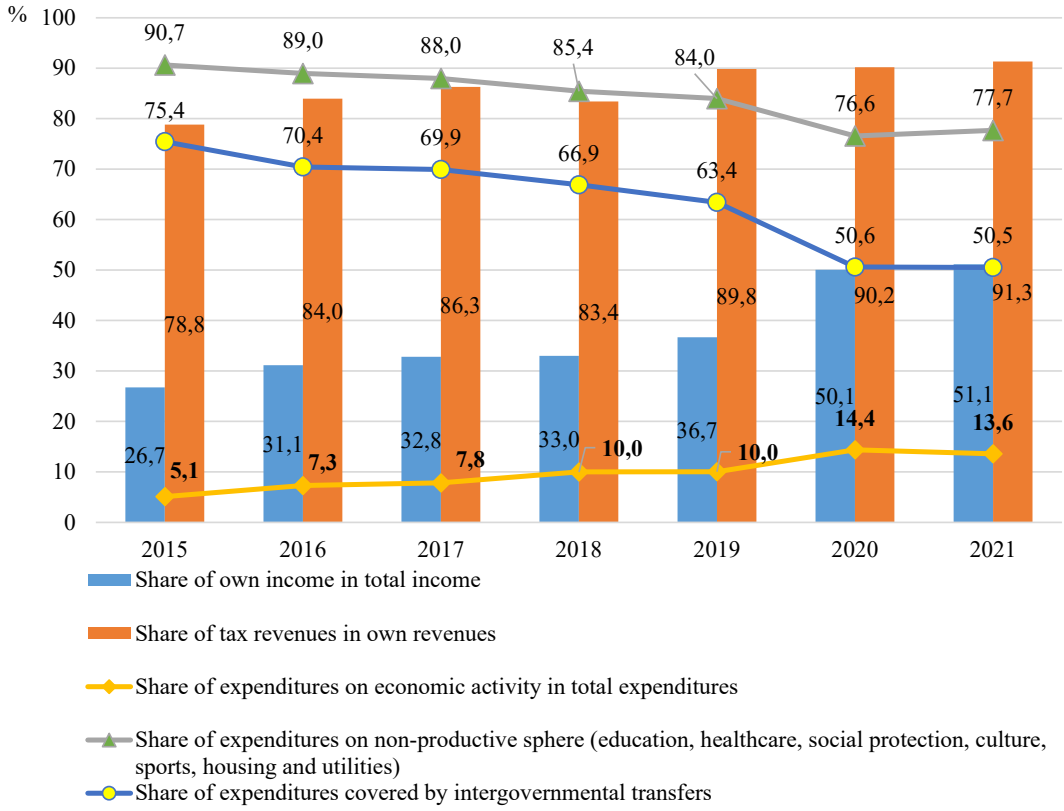

Figure 2.24. Dynamics of financial sustainability indicators of consolidated local budgets of the North-Western region in 2015–2021

Source: built by the authors according to [16; 17; 71]

Positive developments include an increase in the share of own revenues in total revenues (from 26.7% to 51.1%), as well as a certain increase in the share of tax revenues in own revenues (from 78.8% to 91.3%) and a decrease in the share of expenditures covered by intergovernmental transfers (from 75.4% to 50.5%). The stimulation of economic activity has also increased – the share of relevant expenditures has grown from 5.1% to 13.6%. Thus, during periods of economic instability and changes in inter-budgetary relations with the state budget, local budgets in this region have been forced to reorient themselves towards financing the most important expenditure items for maintaining stable development of the territory.

It is also important to study in more detail the financial self-sufficiency in the context of the budgets of territorial communities in the Volyn Oblast (Figure 2.25).

As we can see, in terms of the amount of own revenues per 1 km^2 of territory, a high level of self-sufficiency was demonstrated mainly by urban and adjacent territorial communities. In particular, this applies to the Lutsk community and the adjacent Boratyn, Pidhaitsi, Horodyshche and Kivertsi communities. This is also typical for the Volodymyr-Volyn, Poromiv, Ustyluzka, Ovadnia communities, as

well as the Kovel, Dubove and Lukivka communities. In addition, the Luboml, Rivne, Shatsk, and Vyshneve communities bordering Poland were characterised by a high level of self-sufficiency. The high level of self-sufficiency of the Manevytska community is mainly due to the high level of forest availability and the presence of several powerful forestry branches of the State Enterprise "Forests of Ukraine", which are essentially budget-forming enterprises for this community. Also noteworthy is the low level of financial security of communities in the Northern and Eastern parts of the Volyn Oblast. This is largely due to the low economic activity of businesses and the insignificant tax base for local budgets. The implementation of all the UN Sustainable Development Goals defined at the national and regional level during the war in Ukraine is significantly complicated by the fact that defence and security remain priority tasks, as well as the timely resolution of a number of social problems of the community. This is generally related to the implementation of the socially oriented UN Sustainable Development Goals (Goals 1, 2, 3, 4, 5, 8) and Goal 16 "Peace, Justice and Strong Institutions".

The analysis showed that during the war, urban territorial communities (Lutsk, Volodymyr-Volyn, Kovel) and their neighbouring communities, as well as communities located in the border area with Poland and the Manevychi community, whose self-sufficiency is mainly due to the presence of powerful budget-forming forestry enterprises, were the most self-sufficient. The low level of financial self-sufficiency is particularly marked in the communities of the Northern and Eastern parts of the Volyn Oblast, due to the low level of economic activity of business entities and the low population density in these areas. Therefore, it is important to further explore the possibilities of attracting additional sources of funding in order to increase the amount of own revenues of these communities.

An important source of financial support for the implementation of the Sustainable Development Goals in the North-West region can be the own funds of enterprises. In this context, it is advisable to use the indicator of own working capital, defined as the difference between the amount of equity and the amount of fixed assets of enterprises, which is used in the process of analysing the financial situation of enterprises. It is also possible to estimate the amount of own working capital of enterprises by correlating this indicator with the total value of assets.

Based on the data of Appendix C, the dynamics of the amount of own working capital and its share in the total assets of enterprises in the North-Western region in 2012–2021 is studied (Figure 2.26).

As can be seen, throughout the entire period, enterprises in the region experienced a shortage of their own working capital, which increased sharply in 2014–2017 as a result of the economic crisis following the annexation of part of the territory of our country by Russia. Subsequently, the level of equity deficit of enterprises in this region gradually decreased to 14.2% in 2021. At the same time, it was only 6.4% in the Volyn Oblast, while in the Rivne Oblast it was much higher – 28.1%. In other words, it can be stated that enterprises in the region are experiencing a significant shortage of their own funds to finance their current business activities, so this source cannot be considered a priority for financing the implementation of

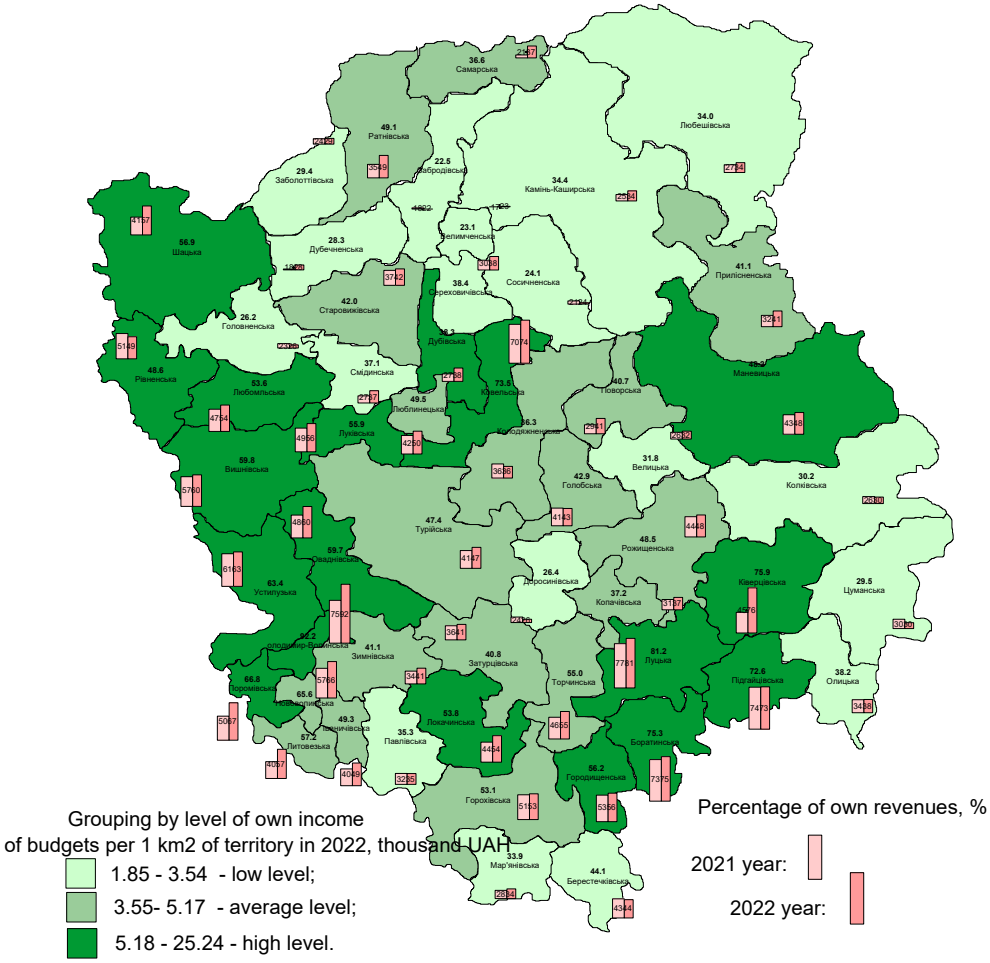

Figure 2.25. Financial self-sufficiency of the budgets of territorial communities in the Volyn Oblast per 1 km² of territory

Source: built by the authors according to the data ([16; 17; 71])

the Sustainable Development Goals in the coming years, given the consequences of a full-scale war for the Ukrainian economy, as only enterprises with a stable financial position will be able to afford additional expenditures. Therefore, an important source of funding may be the use of funds from financial institutions. Accordingly, the dynamics of deposit taking and lending by depository corporations (banks) in the North-Western region during the period 2011–2021 is studied below (Figure 2.27).

As we can see, the total amount of deposits attracted by deposit-taking companies (banks) since 2013 has exceeded the amount of loans granted in the region, which indicates that the attracted funds are not fully used for lending to various groups of economic entities in the region. At the same time, Volyn Oblast has outperformed Rivne Oblast in terms of lending activity and deposit attraction almost throughout the entire period of analysis.

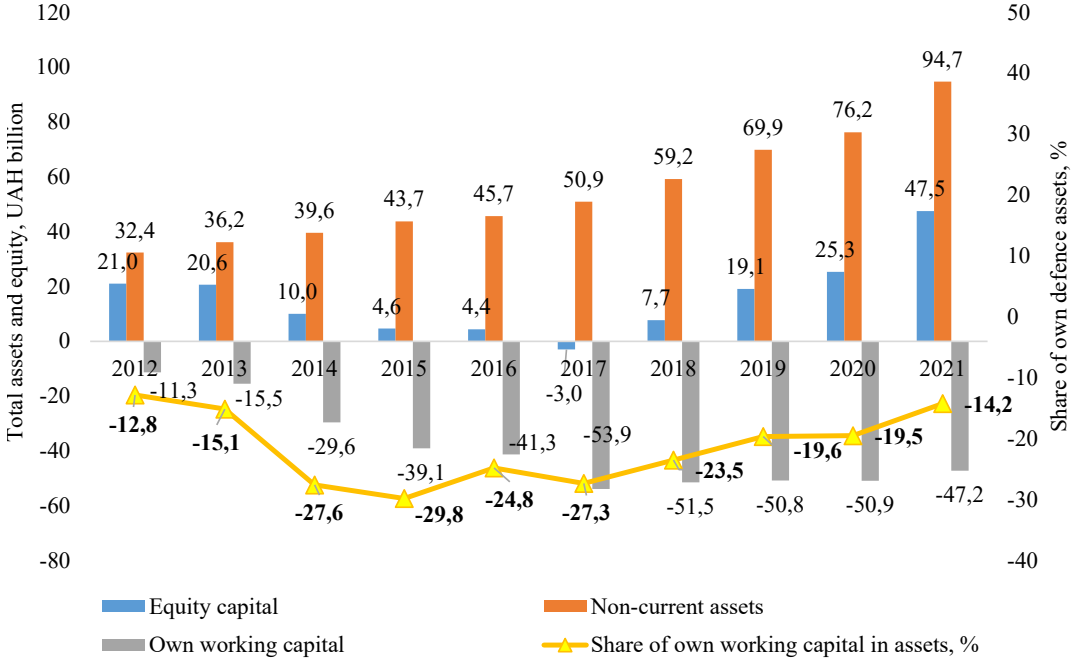

Figure 2.26. Dynamics of own working capital of enterprises and their share in the total assets in the North-Western region in 2012–2021

Source: built by the authors according to [16; 17])

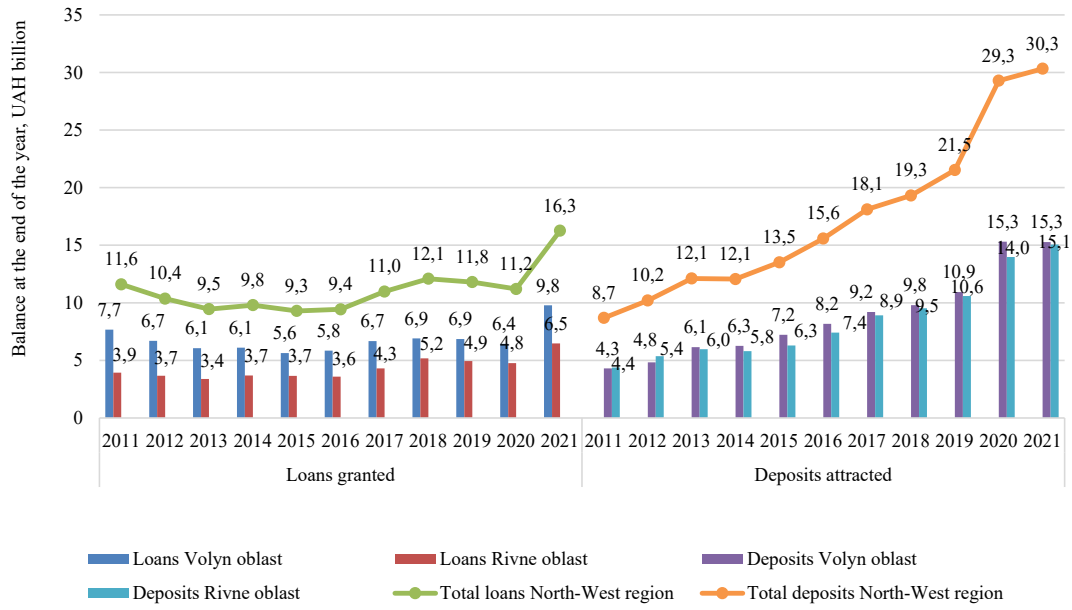

Figure 2.27. Financial support of the North-Western region by attracting deposits and granting loans by depository corporations (banks) in 2011–2021

Source: compiled by the authors based on data from [58]

The following is a more detailed study of the change in the structure of sources of deposits and areas of lending by item for 2011–2021 (Table 2.5).

Table 2.5

Changes in the Structure of Sources of Deposits and Lending by Depository Corporations (Banks) by Item in the North-Western Region in 2011–2021, %

Indicators	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Change 2021 to 2011
Loans from depository corporations	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**0,0**
other financial corporations	2,7	0,8	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,1	-2,6
general government sector	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
non-financial corporations	50,9	54,2	55,3	50,1	51,9	54,0	52,8	52,3	53,0	51,8	59,0	8,1
households	46,4	45,0	44,7	49,9	48,0	45,8	46,9	47,3	46,5	47,4	40,1	-6,3
Non-profit organisations serving households	0,0	0,0	0,0	0,0	0,0	0,1	0,2	0,3	0,5	0,8	0,8	0,8
Deposits attracted by depository corporations	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**0,0**
other financial corporations	0,7	0,5	0,4	0,4	0,4	0,4	0,5	0,6	0,4	0,3	0,3	-0,5
general government sector	0,1	0,6	0,1	0,2	0,3	0,5	0,4	0,6	0,4	0,7	0,4	0,2
non-financial corporations	22,8	19,2	15,8	17,1	21,3	24,5	22,9	20,5	22,5	28,4	29,2	6,4
households	76,0	79,2	83,2	81,6	77,0	73,6	75,0	77,0	75,5	69,3	68,7	-7,3
non-profit organisations serving households	0,4	0,5	0,6	0,8	0,9	1,0	1,2	1,3	1,2	1,3	1,5	1,1

Note. Built by the authors based on data from [58].

During the analysed period, the region's banking sector shifted from providing loans mainly to households to mainly non-financial corporations (59.0% of the total in 2021). On the other hand, households remained the main source of deposits, but their share decreased (from 76.0% to 68.7%), while the share of non-financial corporations increased (from 22.8% to 29.2%). Obviously, in the wartime and post-war periods, the ability of depository corporations (banks) to attract deposit funds and redistribute them for additional lending will be limited, so additional incentives will be important.

Therefore, for the macro regions of Ukraine, which include the North-Western region, which includes Volyn and Rivne Oblasts, it is important to form an effective system of financial support for achieving the Sustainable Development Goals by 2030.

Therefore, in the coming periods, it is of particular importance for the North-Western region to create favourable conditions for increasing capital investments in

both tangible and intangible assets, as they will ensure the renewal of fixed assets on an innovative basis, which will increase the production of products competitive in domestic and foreign markets by tapping into the powerful natural resource potential of this region, which will ultimately contribute to the improvement of its socio-economic development.

2.3. Methodology for assessing financial support for achieving sustainable development goals at the regional level

The object of the study is the process of multi-criteria assessment of the level of financial support for the implementation of the SDGs in the border regions of Poland (Lubelskie Voivodeship and Podkarpackie Voivodeship) and Ukraine (Volyn Oblast and Lviv Oblast). The Transcarpathian region of Ukraine is not taken into account due to its short border with Poland and its predominant focus on international cooperation with Hungary.

It is known that 17 SDGs have been identified at the global level, so it is not possible to select one or more generalised indicators to assess the financial support for their implementation. After all, each of the SDGs has its own focus on solving a separate important global problem. In addition, each country, in accordance with the current system of statistics, can identify many indicators that will characterise the attraction and use of funds to finance the achievement of each of the SDGs. However, if interregional comparisons are made, additional problems of comparability, relevance, comparability, and temporal consistency of statistical data are added.

The issue of making inter-regional comparisons on the implementation of the SDGs has been widely covered in many scientific studies.

As a rule, each country develops its own system of indicators to assess the achievement of the SDGs. Such indicators are also defined in Poland [137] and Ukraine [51; 56].

The central statistical offices of Poland [137] and Ukraine [138] have also created official online platforms for reporting on the achievement of national SDGs. However, the common problem is that these data are presented for the whole country without disaggregation by individual regions, which does not allow for interregional comparisons of the same indicator indicators defined by Polish and Ukrainian statistics in this area.

Eurostat has also introduced the practice of preparing annual analytical reviews [150] on the achievement of the SDGs in the EU.

However, the presented statistical studies are based on the study of SDG indicators, which mostly do not contain financial indicators that characterise the use of various financing instruments, as well as the scale of mobilisation and efficiency of using funds from various sources.

Of course, to some extent, positive or negative results of the assessment of the degree of achievement of the SDGs can be linked to the corresponding sufficient or insufficient level of financing for their implementation. However, this would be an overly simplistic statement that is not supported by any specific financial methodology. After all, the implementation of the SDGs is influenced by many

other factors besides financial ones: political, natural, legal, institutional, market, demographic, information technology, sanitary and hygienic, etc.

Therefore, in order to assess financial support for the implementation of the SDGs, it is necessary to formulate a specific system of indicators that can assess the scale and effectiveness of financing from different sources using a wide range of financial instruments.

The main problem of the study is that there is currently no single internationally recognised method for assessing the level of financial support for the implementation of the SDGs, nor a single system of indicator indicators that would be determined by a single methodology at the level of countries and their regions and would be comparable, i.e. acceptable for interregional comparisons.

Based on the understanding of sustainable development as a complex, multi-faceted, integrated and multi-dimensional global process, we note that it is impossible to take into account only one or a few indicators to assess the level of its financial support, even at the level of subnational regions. Each of the components of sustainable development covers its own area of activity, which in turn involves the study of many indicators that allow us to examine the specifics of financial support for sustainable development from different angles.

Therefore, in order to assess the financial support for the implementation of the SDGs, it is advisable to use a system of indicators, which also involves the use of statistical methods of multivariate data analysis to generate generalised estimates.

It is advisable to identify a set of key indicators for each of the 17 SDGs, which will characterise the level of financial support for their achievement. It is also important to develop summary indicators to assess the level of financing for each SDG. Many studies suggest that the SDGs can be grouped into three key areas, which are traditionally covered by the understanding of sustainable development as a harmonious combination of environmental, social and economic components.

In particular, researchers [167] found a strong link between the sustainable finance model and social sustainability (SDGs 1, 3, 4, 5, 10, 16), environmental sustainability (SDGs 11, 12, 13, 15) and economic sustainability (SDGs 8, 9, 17). The approach of dividing the SDGs into groups was applied by the Ministry of Economy of Ukraine in the process of formulating the Sustainable Development Goals of Ukraine 2030 [51]. Thematic working (expert) groups have been created in four main areas: economic (SDGs 2, 8, 9 and 12), environmental (SDGs 6, 7, 13, 14 and 15), social (SDGs 1, 3, 4 and 10) and institutional (SDGs 5, 11, 16 and 17), which can also be seen as an approach to grouping the 2030 Sustainable Development Goals.

We believe that at the initial stage of the study, it is advisable to group the 17 Sustainable Development Goals 2030 by components as follows: social component (SDGs 1, 3, 4, 5, 10, 16), economic component (SDGs 2, 8, 9, 11, 17), environmental component (SDGs 6, 7, 12, 13, 14, 15).

In particular, the inclusion of Goal 5: Gender equality in the social component is explained by its focus on ensuring equal rights and freedoms for different social groups, including men and women.

The inclusion of Goal 2 "End hunger" in the economic component is explained by the fact that this goal, although aimed at achieving the primary needs of people, requires economic development to produce the necessary amount of food to prevent hunger. Also, the inclusion of Goal 11 "Sustainable Development of Cities and Communitie" in the economic component is explained by the need to form, first of all, an effective system of economic relations in cities and communities that will ensure compliance with the principles of sustainable development.

The inclusion of Goal 6 "Clean water and adequate sanitation" and Goal 7 "Affordable and clean energy" in the environment component is explained by the fact that they aim to ensure the sustainable use of water and the transition to non-traditional (renewable) energy sources, which are natural environmental resources. The inclusion of Goal 12 "Responsible consumption and production" in this component is explained by its priority focus on reducing waste and ensuring its recycling to reduce negative impacts on the environment.

Given that the SDGs can be grouped into components of sustainable development (social, economic, environmental), it is also advisable to define a system of relevant generalised indicators for each component. The next step is to develop an aggregate indicator that will characterise the effectiveness of financial support for sustainable development in a particular region, group of regions, or country. This will allow for their grouping and for each group to develop strategies to improve the level of financial support for the implementation of the SDGs.

The identified components will serve as the evaluation criteria, and the SDGs attributed to each component as sub-criteria (Figure 2.28).

In order to assess the level of financial support for sustainable development for each SDG, it is necessary to identify the main indicators. For each indicator, it is necessary to determine its direction. That is, whether it is a stimulator (its growth is considered positive) or a discourager (its decline is considered positive). Taking into account that these indicators have different units of measurement and levels of focus, it is advisable to transform them into dimensionless values – indices – for the purposes of a comprehensive assessment. This makes it possible to summarise the level of efficiency of financial support for the sustainable development of the region, both for a specific component and for all components in general, for individual years of the period analysed.

At present, approaches to conducting a comprehensive assessment based on a comparative analysis of indicator indicators in the regional context have been widely developed. However, the specifics of this assessment involve comparing indicators across border regions. Therefore, among the approaches, it is advisable to choose the one that involves comparing the values of indicators with their maximum, minimum or average level over the entire period under review.

The directions and sources of financial support for the implementation of the SDGs may vary: budget revenues and expenditures, bank loans, investment expenditures, current expenditures of business entities, foreign direct investment, equity, international and European Union funds, household income and expenditures, etc. It is important that the available statistics cover all possible sources and directions of financing.

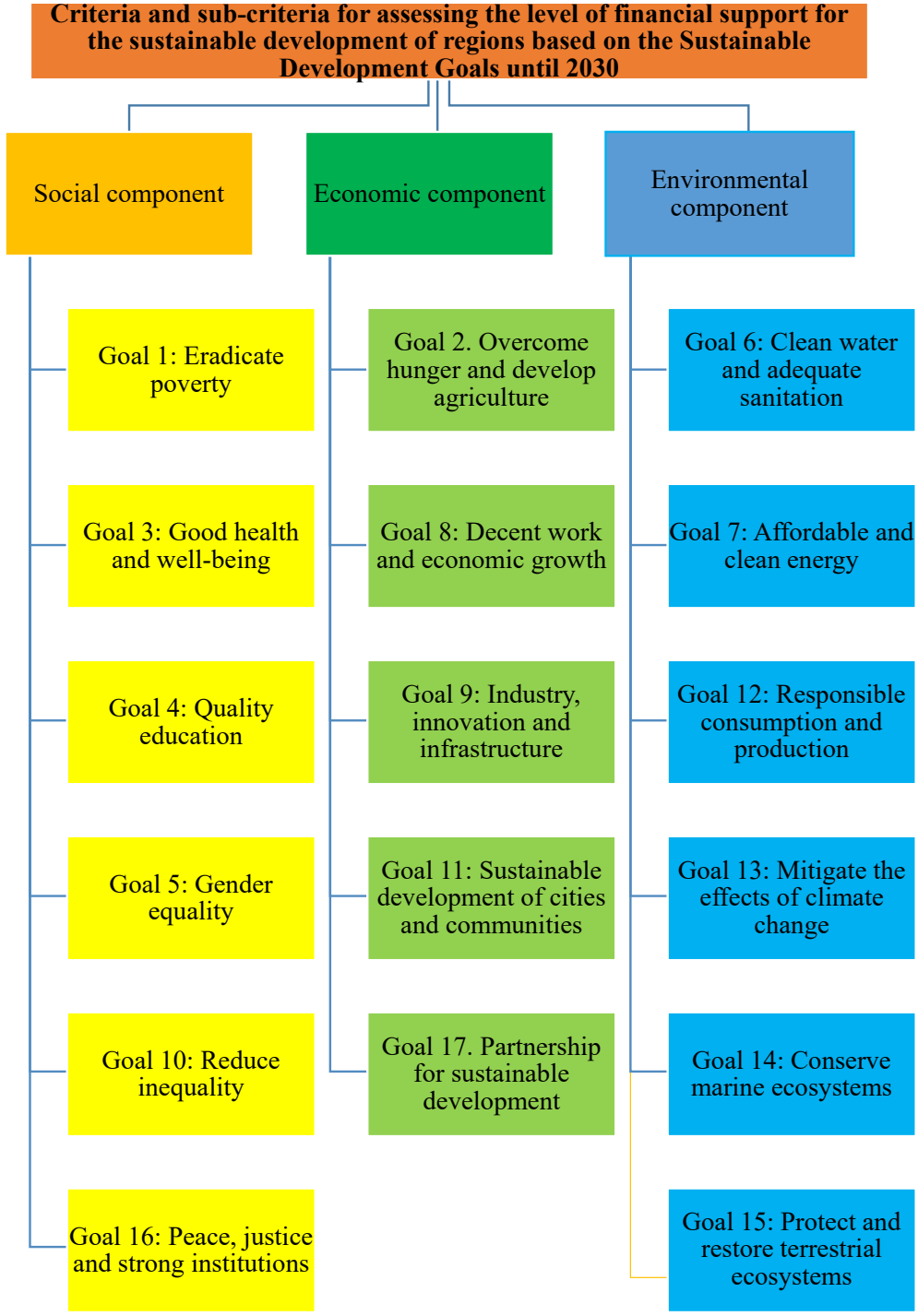

Figure 2.28. Grouping of criteria and sub-criteria for assessing the level of financial support for sustainable development of regions based on the SDGs

Source: based on the generalisation of works [51;136; 151; 167]

Given that scientific research is based on a dialectical approach involving the study of phenomena and processes in their development and dynamics, it is important that the assessment of the level of financial support for the implementation of the SDGs is based on data for a longer period of time than one year. At the same time, the basic conditions for the functioning of socio-ecological and economic systems can change significantly under the influence of external factors over periods of more than three years. It is therefore most appropriate to assess and compare the level of financial security over the last three years for which consolidated statistical data are available.

A study of the existing information base presented by the State Statistics Service of Ukraine [31], the Ministry of Finance of Ukraine [71], the National Bank of Ukraine [58] and Eurostat [150] that can be used to study the processes related to the financing of measures to achieve the Sustainable Development Goals by 2030 has shown that Ukraine has a number of limitations in obtaining data for a full analysis and assessment of the financial support for sustainable development at the national, regional and local levels:

– due to the administrative reform, there are no detailed statistics on revenues and expenditures of lower-level budgets (by rayons and territorial communities);

– there is also no single comprehensive source of information, such as the "Bank of Data Local (BDL)" in Poland, where you can select the data you need according to various criteria;

– there are no official statistics on the development and financing of renewable energy by region;

– some indicators of household statistics are not comparable with Eurostat data;

– environmental statistics do not fully cover the issue of financial support for the implementation of the 2030 Sustainable Development Goals, etc.

Due to these and other problems, the developed indicator system may not cover all possible areas and sources of funding for the implementation of the 2030 Sustainable Development Goals in accordance with national priorities.

In the future, the task is to select the most appropriate indicators based on the available statistical data that will meet the defined criteria and sub-criteria for evaluation.

Some authors [166] used the method of the inverse correlation coefficient matrix to select indicators for monitoring changes in sustainable development by environmental, social and economic components. Other researchers [102] proposed a common set of indicators for assessing Poland's sustainable development without dividing them into relevant components. Another study [123] pays more attention to identifying the main models of implementation of revolving financial instruments in the European Union, analyses the effectiveness of their use and identifies barriers to their implementation.

It is also interesting to note [114] that without a clear selection method, indicators can be distorted and not fully take into account the key principles of sustainable development, and therefore may be ineffective for evaluation.

M. Ziolo has identified a system of indicators that can be used to assess sustainable financing in Poland at the national level and at the voivodeship level according to

the available information base [167]. However, most of the indicators cannot be defined in accordance with the specifics of the presentation of Ukrainian statistics. Some researchers [164] believe that financial and legal instruments to promote the implementation of sustainable development policy direct financial resources to the implementation of certain goals, thereby creating a gap in the implementation of other Global Sustainable Development Goals by 2030.

When selecting indicators, it is also important to take into account the view [42] that the *main forms of financial support for sustainable development* include financing, lending and investment, which, depending on the source of funding, are classified as public and private, national, international and global. At the same time, specific financial instruments can be used for each form of financial support for sustainable development. It should also be noted that the selected indicators should take into account the current problems of the development of the Polish-Ukrainian border area [136]. In order to assess the level of financial support for the implementation of each SDG, we believe it is advisable to select relative indicators that reflect the results of attracting and using financial resources from different sources.

Based on a comparative analysis of the data from these official statistical sources from Poland and Ukraine, the main indicators that can be used to assess the level of financial support for the achievement of the SDGs were selected.

A system of indicators grouped by each criterion and sub-criterion for assessing the level of financial support for the achievement of the SDGs, adapted to the possibility of obtaining comparable statistical data for the administrative regions of Ukraine, in particular for Volyn and Rivne Oblasts, is presented in Tables 2.6-2.8.

As the regions of North-Western Ukraine are landlocked, there is no data to identify a separate sub-criterion for Goal 14 related to the environmental component. Therefore, this sub-criterion for these regions cannot be included in the overall assessment. In total, the developed system of indicators for a multi-criteria assessment of the level of financial support for the implementation of the 2030 Sustainable Development Goals consists of 70 indicator indicators that comprehensively characterise various sources of funds and areas of financing. It should again be emphasised that the system of indicators is based on the statistical database available at the time of the study, which is comparable across the regions of Ukraine. The introduction of additional indicators or replacement of the indicators highlighted in Tables 1.1-1.3 requires additional statistical observations to collect and summarise the necessary statistical data. This requires appropriate decisions by the statistical institutions of the regions and the State Statistics Service of Ukraine as a whole. It is also possible that Eurostat will develop such a broad system of indicators for the European Union, and Ukraine, as a country seeking membership, will join this initiative on a voluntary basis.

Table 2.6

Sub-criteria and indicators for assessing the level of financial support for the implementation of the 2030 Sustainable Development Goals by the Social Component criterion

Component (criterion)	Sustainable Development Goals 2030 (sub-criteria)	Indicators for assessing the level of financial security	Orientation: stimulant (+) destimulant (-)
Social component	Goal 1: Eradicate poverty	1. Consolidated local government expenditure on social protection and social security as a proportion of total expenditure, %	+
		2. Ratio of average monthly wage to subsistence level	+
		3. Percentage of households whose average total income per capita is below the median level of cash income, %	-
		4. Percentage of low-income families receiving financial assistance out of total needy families, %	+
		5. Loans granted by deposit-taking institutions to households as a proportion of total loans, %	+
	Goal 3: Good health and well-being	6. Investment in health and social care as a percentage of total investment, %	+
		7. Capital investments in Arts, sports, entertainment and recreation in total capital investments, %	+
		8. Consolidated local budget expenditures on healthcare in total expenditures, %	+
		9. Consolidated local budget expenditures on physical culture and sports in total expenditures, %	+
		10. Total household expenditure on health as a percentage of total expenditure, %	-
	Goal 4: Quality education	11. Capital investments in education as a percentage of total capital investments, %	+
		12. Consolidated local budget expenditures on education in total expenditures, %	+
		13. Average salary of education workers compared to regional average, %	+
		14. Share of household cash expenditure on education in total cash expenditure, %	-
	Goal 5: Gender equality	15. Index comparing women's salaries to the regional average	+
		16. Gender pay gap index	+
		17. The index comparing women's salaries in the region with data for Ukraine	+
	Goal 10: Reduce inequality	18. Concentration ratio (Gini index)	-
		19. Decile coefficient of total income differentiation (ratio of income of the richest to the poorest 10% of the population), times	-
		20. Ratio of average monthly salary in the region and in Ukraine, %	+
		21. Per capita disposable income compared to national average, %	+
	Goal 16: Peace, justice and strong institutions	22. Investment in public administration and defence; compulsory social security as a percentage of total investment, %	+
		23. Expenditure from the consolidated local budget on the prevention and alleviation of emergencies and the consequences of natural disasters as a proportion of total expenditure, %	+
		24. Consolidated local budget expenditures on law enforcement and state security in total expenditures, %	+
		25. Consolidated local budget expenditures on public administration in total expenditures, %	+
		26. Average monthly salary of employees in public administration and defence; compulsory social insurance up to the regional average, %	+

Source: author's development

Table 2.7

Sub-criteria and indicator indicators for assessing the level of financial support for the implementation of the 2030 Sustainable Development Goals by the Economic Component criterion

Component (criterion)	Sustainable Development Goals 2030 (sub-criteria)	Indicators for assessing the level of financial security	Orientation: stimulant (+) destimulant (-)
Economic component	Goal 2. Overcome hunger and develop agriculture	27. Capital investment in agriculture, forestry and fisheries in total capital investment, %	+
		28. Share of investment in agriculture, forestry and fisheries in total foreign direct investment (equity instruments), %	+
		29. Consolidated local budget expenditures on agriculture, forestry, fisheries and hunting in total expenditures, %	+
		30. Share of expenditure on food and non-alcoholic beverages in total household expenditure, %	-
	Goal 8: Decent work and economic growth	31. Real wage index in the region, %	+
		32. GRP physical volume index in previous year's prices, %	+
		33. Personal income tax receipts to the consolidated local budget as own resources, %	+
		34. Share of wages in total household resources, %	+
	Goal 9: Industry, innovation and infrastructure	35. Share of investments in the manufacturing industry in the total balance of foreign direct investment (equity instruments), %	+
		36Capital investments in Transport, warehousing, postal and courier activities in total capital investments, %	+
		37. Capital investments in Professional, scientific and technical activities in total capital investments, %	+
		37. Consolidated local government expenditure on transport, roads, communications, telecommunications and informatics as a proportion of total expenditure, %	+
		39. Capital investments in the Industrial sector in total capital investments, %	+
	Goal 11: Sustainable development of cities and communities	40. Capital investments in administrative and support services as a percentage of total capital investments, %	+
		41. Consolidated local budget expenditures on housing and communal services in total expenditures, %	+
		42. Consolidated local budget expenditures on construction in total expenditures, %	+
		43. Capital investments in the Construction sector in total capital investments, %	+
		44. Share of own revenues in total revenues of the consolidated local budget, %	+
	Goal 17. Partnership for sustainable development	45. Direct investments of non-residents in the region (equity and debt instruments) at the end of the year, mln USD USD	+
		46. Share of financing of capital investments of enterprises at the expense of foreign investors, %	+
		47. Exports of goods and services in total exports in the country, %	+
		48. Ratio of imports to exports of goods in the region	+
		49. Ratio of services imports to exports in the region	+

Source: author's development

Table 2.8

Sub-criteria and indicator indicators for assessing the level of financial support for the implementation of the 2030 Sustainable Development Goals by the Environmental Component criterion

Component (criterion)	Sustainable Development Goals 2030 (sub-criteria)	Indicators for assessing the level of financial security	Orientation: stimulant (+) destimulant (-)
Environmental component	Goal 6: Clean water and adequate sanitation	50. Capital investment in wastewater treatment as a proportion of total capital investment in environmental protection measures, %	+
		51. Current expenditures on wastewater treatment in total current expenditures on environmental measures, %	+
		52. Rent for special water use in the total rent for the use of natural resources in local budget revenues, %	+
	Goal 7: Affordable and clean energy	53. Capital investments in the supply of electricity, gas, steam and air conditioning in total capital investments, %	+
		54. Share of household expenditures on housing, water, electricity, gas and other fuels in total expenditures, %	-
		55. Installed capacity of renewable energy sources, MW	+
		56. Share of the total capacity of alternative fuel boilers in the total capacity of boiler houses in the region, %	+
		57. Share of disbursed funds for "Construction, modernisation and reconstruction of power grids and equipment" in the overall investment programme of Oblenergos, %	+
	Goal 12: Responsible consumption and production	58. Current expenditures on waste management in total current expenditures on environmental measures, %	+
		59. Capital investment in waste management as a proportion of total capital investment in environmental protection measures, %	+
		60. Share of current expenditures on environmental protection measures in the processing industry in total expenditures on these measures, %	+
		61. Share of capital investments in environmental protection measures in the processing industry in total expenditures on these measures, %	+
	Goal 13: Mitigate the effects of climate change	62. Capital investments in air protection and climate change issues in total capital investments in environmental protection measures, %	+
		63. Current expenditures on air protection and climate change issues in total current expenditures on environmental protection measures, %	+
		64. Environmental tax in total tax revenues to the local budget, %	+
		65. Local budget expenditures on environmental protection in total expenditures, %	+
	Goal 15: Protect and restore terrestrial ecosystems	66. Capital investments in protection and rehabilitation of soil, groundwater and surface water in total capital investments in environmental protection measures, %	+
		67. Capital investment in biodiversity and habitat conservation as a proportion of total capital investment in environmental protection measures, %	+
		68. Current expenditures on biodiversity and habitat conservation in total current expenditures on environmental protection measures, %	+
		69. Current expenditures on protection and rehabilitation of soil, groundwater and surface water in total current expenditures on environmental protection measures, %	+
		70. Rent for special use of forest resources in total tax revenues to the local budget, %	+
	Goal 14: Conserve marine ecosystems	not applicable	not applicable for the selected research object

Source: author's development

In general, we believe that it is not possible to select a single indicator that would allow a comprehensive assessment of the level of financial support for the implementation of all and individual SDGs. Therefore, it is advisable to determine this level gradually, for each of the 17 SDGs separately. Then, the assessment should be generalised by individual components or areas of sustainable development (social, economic, environmental). Finally, this will allow for an integrated assessment of the level of financial support for the implementation of the SDGs. For the successful implementation of all identified stages of the assessment, it is advisable to standardise the indicators that characterise the level of financial support and move to dimensionless values – indices. The values of the indices can be summarised by individual indicators, sub-criteria and criteria for assessing the level of financial support for the implementation of the SDGs, and in the final stage a general assessment based on an integrated index can be carried out. As the assessment will be carried out for the Polish and Ukrainian border regions, it will be possible to identify the advantages and disadvantages of each region and to develop a regional strategy for improving the level of financial support for the implementation of the SDGs in the North-Western region. The stages of applying the multi-criteria index assessment methodology to compare the levels of financial security of regions are detailed in Figure 2.29.

The next step is to choose a method for determining the indices. This is important because often the indices obtained as a result of an integrated assessment, as well as the results of their grouping, can differ depending on the method chosen. The key issue is the choice of an approach to converting the values of the indicators into their individual indices.

The study by D. Perło [141] presents a detailed analysis of methods for modelling sustainable development of regions, in particular economic and statistical interregional comparisons based on statistical indices. The study by J. Poburko [142] and O. Raevneva [72] contains an analysis of the advantages and disadvantages of various methods of interregional comparisons, as well as approaches to building a system of criteria and sub-criteria for multi-criteria assessment.

Eurostat, in preparing its monitoring report on the progress towards achieving the SDGs in the EU [150], used different methods to assess trends in indicator changes, depending on whether the primary indicators have or do not have quantitative targets, but generally did not conduct an integrated assessment across all SDGs.

Methodological approaches to the application of the index method for conducting a multicriteria assessment of processes that to some extent relate to the implementation of the SDGs or relevant components are reflected in [121] and [122].

In modern practice, the taxonomic method is mainly used to determine individual indices based on primary indicators. This is reflected, in particular, in the official methodological approaches to interregional comparisons at the level of our country: Methods for calculating integrated regional indices of economic development [64], and Methods for monitoring and evaluating the effectiveness of the implementation of the state regional policy [65]. Since the level of financial support for sustainable development is a variable, but it is important to maximise it, it is advisable to use the approach set out in these methodologies for the purpose of standardisation to bring the indicator indicators to a comparable form by converting them into individual indices.

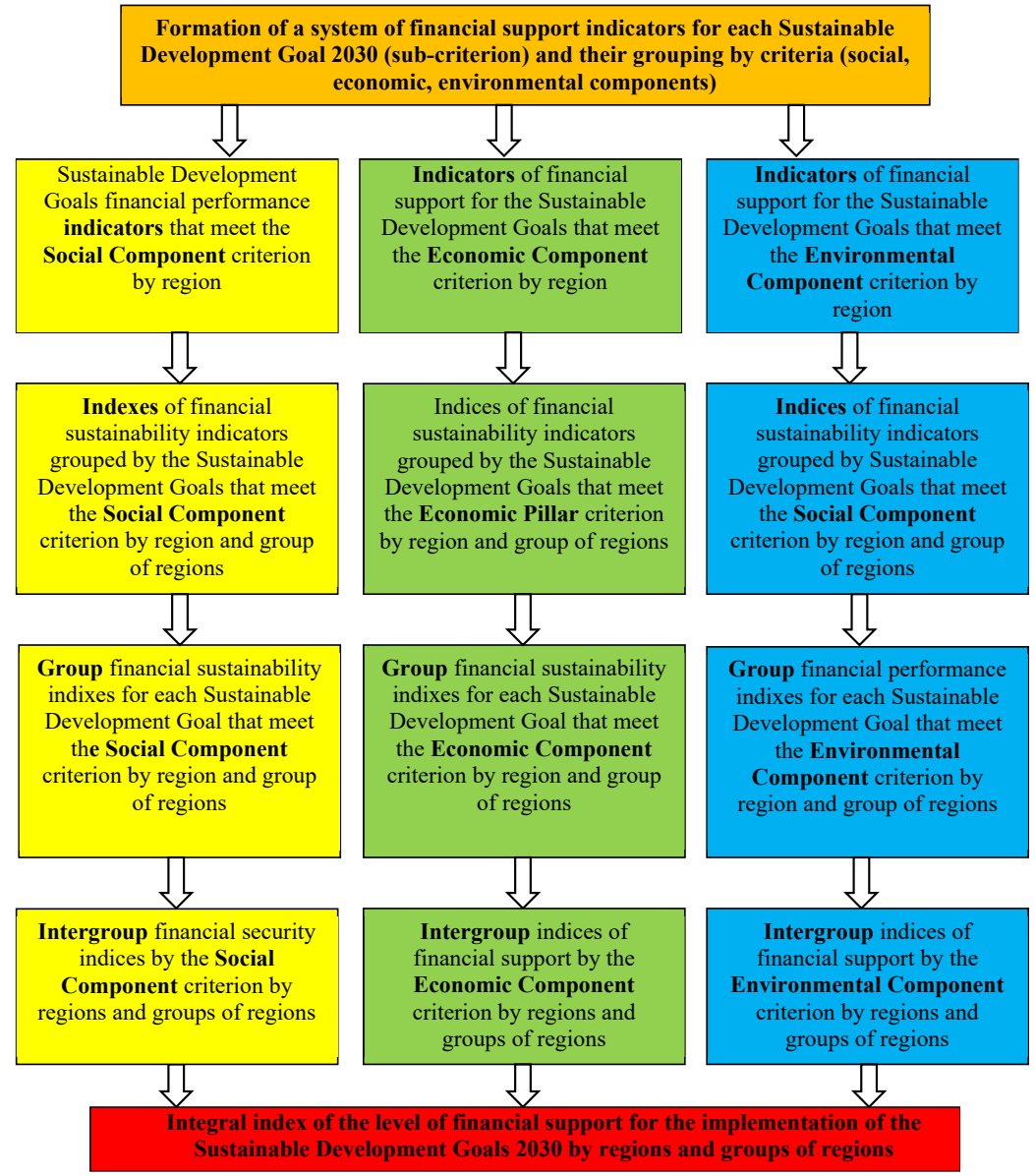

Figure 2.29. Stages of Application of the Methodology of Multicriteria Index Assessment for Comparison of Levels of Financial Support for Sustainable Development of Regions

Source: summarised by the authors on the basis of [56; 151]

The advantage of this method is that the values of the indices will be ranked in ascending order from 0 to 1, which will facilitate further comparative analysis and evaluation. At the same time, in accordance with the defined research object, the integral assessment will be carried out both for individual regions (Volyn and Rivne) and for the North-Western Region as a whole.

Primary indices of indicators of financial support for sustainable development $I_{ij}^{kp}(t)$ by region, sustainable development goals, and depending on the focus of the indicator (simulator or disincentive) will be determined by the following formulas:

– for stimulant indicators: $I_{ij}^{pk}(t) = \frac{Y_{ij}^{pk}(t) - Ymin_j^{pk}(t)}{Ymax_j^{pk}(t) - Ymin_j^{pk}(t)}$, (1.1)

– for destimulator indicators: $I_{ij}^{pk}(t) = \frac{Ymax_j^{pk}(t) - Y_{ij}^{pk}(t)}{Ymax_j^{pk}(t) - Ymin_j^{pk}(t)}$, (1.2)

$Y_{ij}^{pk}(t)$ – is the value of the *j-th* assessment indicator from the *p-th* sub-criterion and the *k-th* criterion for the *i-th* region in period *t*;

$Ymax_j^{pk}(t)$ – is the maximum value of the *j-th* assessment indicator among the *p-th* sub-criterion included in the *k-th* criterion in period *t* among all regions;

$Ymin_j^{pk}(t)$ – is the minimum value of the *j-th* assessment indicator among the *p-th* sub-criterion included in the *k-th* criterion in period *t* among all regions;

k – is the number of the criterion (1 – social component; 2 – economic component, 3 – environmental component) for assessing the financial security of the *i-th* region in period t;

p – is the number of the sub-criterion (corresponds to the number of the Sustainable Development Goal 2030) for assessing the financial provision included in the criterion (component) *p* for the *i-th* region in period *t* (*p = 1 ... 17, and for landlocked regions – p = 1 ... 16*);

j – number of the individual indicator in the group of sub-criteria (for example, for sub-criteria 1: *j = 1 ... 5*; for sub-criteria 4: *j = 11 ... 14*);

i – number of the region under study (*i = 1 ... I, 1 – Volyn Oblast, 2 – Rivne Oblast, 3 – North-Western Region*);;

t – the number of the period (year) of the indicator assessment (*consecutively: 2017, 2018, 2019, 2020, 2021*).

The primary (individual) indicator indices obtained in the first stage will become the basis for determining group (or sub-criterion) indices corresponding to individual SDGs, and will be determined as the arithmetic mean of the values of the respective individual indices. In the future, group (criterion) indices will be determined separately for the three components of sustainable development – social, economic and environmental – as the arithmetic mean of the values of the group indices corresponding to the respective component.

The integral index for assessing the level of financial support for sustainable development is calculated as the arithmetic mean of the inter-group indices (by economic, social and environmental components).

According to the above, the group index for assessing the level of financial security of the *i-th* region according to the *p-th* sub-criterion, which is attributed to the *k-th* criterion in the period *t* – $I_i^{pk}(t)$ is defined as the arithmetic mean of individual indices of indicators related to the relevant Sustainable Development Goal:

$$I_i^{pk}(t) = \frac{\sum_{j=1}^{J} I_{ij}^{pk}(t)}{m_p} \tag{1.3}$$

where m_p – is the number of individual indices, on the basis of which the group index is determined by sub-criterion *p*.

Intergroup index for assessing the level of financial security of the *i-th* region according to the *k-th* criterion in the period t – $I_i^k(t)$ is defined as the arithmetic mean of group indices:

$$I_i^k(t) = \frac{\sum_{g=1}^{G} I_i^{pk}(t)}{G_k}. \tag{1.4}$$

where G_k – the number of group indices on the basis of which the intergroup index is determined by the criterion *κ*.

Integral index for assessing the level of financial security of the *i-th* region in the period t – $I_i(t)$ is defined as the arithmetic mean of intergroup indices:

$$I_i(t) = \frac{\sum_{k=1}^{K} I_i^p(t)}{K}. \tag{1.5}$$

where *K* – the number of intergroup indices (criteria) on the basis of which the integral index is determined (*K =3, k = 1 ... 3*).

The value of all the above indices on average for the period (2017–2021) is determined as the arithmetic mean of the values of these indices for individual years.

To visually present the results of a multicriteria assessment, it is advisable to create tables, figures and diagrams: with data and calculation results of: individual and group indices; group and intergroup indices; intergroup and integral indices.

In addition, in order to classify the regions according to certain levels of financial support for sustainable development, depending on the values of the individual, group, intergroup and integral indices obtained, it is proposed to group them by allocating them to three groups at equal intervals:

– 0,000 – 0,333 – low level of financial support;
– 0,334 – 0,666 – average level of financial support;
– 0,667 – 1,000 – high level of financial support.

In order to visualise the results of the grouping by level of financial security, it is advisable to highlight the results of the calculation of the indices in the relevant tables in different colours in order to emphasise that they belong to a specific group on the basis of their numerical value.

It should be noted that in a full-scale war, official statistics on most of the indicators selected for the multicriteria assessment may be provided with a certain time lag, which objectively may be more than 1–2 years from the regulatory deadlines for publication. Therefore, for a quick assessment of the level of financial security, based on the availability of this information, it is possible to use an express method of adjusting the obtained indicators for the period (in our case, 2017–2021) by the

percentage change in the country's real gross domestic product for the next year (or years).

Therefore, it is advisable to take into account the adjusted indicators and the results of their grouping when formulating policies and strategies to improve the level of financial support for the implementation of the SDGs in the administrative regions and oblasts.

At the next stage, based on the results of grouping the values of integral and group indices, develop a Matrix for choosing a strategy for financial support of sustainable development depending on the results of a multicriteria assessment (Table 2.9).

The main principle behind this table is the understanding that if the results of the multi-criteria assessment show a low level of financial support for sustainable development, the region should focus on addressing the most pressing issues. In other words, in this case, it is proposed to implement the strategy "Focus on financing priority measures and attract additional investment to implement the SDGs" under the relevant social, economic or environmental component.

If the average level of financial support is achieved, it is proposed to continue to look for new and promising instruments and areas of financing for the SDG re-launch, i.e. the regions concerned are encouraged to implement strategies to diversify the sources and areas of financing for the implementation of the SDGs.

In case of achieving a high level of financial support, it is proposed to further develop the range of instruments and areas of financing for SDG relaunch, i.e. the region concerned is encouraged to implement a strategy to expand sources and areas of financing for SDG implementation.

In addition, based on the results of the multi-criteria assessment of the Group's indicators for each of the SDGs, the following basic provisions of the Group's strategy are proposed for each of these goals.

The proposed methodology of multi-criteria evaluation will thus make it possible not only to examine the level but also to substantiate the main provisions of the strategy of financial support for sustainable development for individual regions or for the North-West Region as a whole.

On the basis of the analysis, it can be said that the confidence of foreign investors in resuming investment in the economy of the Northwest region of Ukraine is gradually increasing, especially in the Volyn region, which is close to the EU border. At the same time, it should be noted that the main source of investment throughout the period remains the use of equity instruments, i.e. the contribution of funds for the purchase of shares or stakes in enterprises. Investment through debt instruments is less common, reflecting to some extent the reluctance of foreign investors to provide loans for business development in Ukraine.

The study of trends in a number of key indicators characterising financial support for investment activity at the regional level over the long period 2010–2019 has revealed a number of problematic issues: nominal amounts of investment are constantly growing, but according to real estimates they decrease in periods of economic instability; The Volyn Oblast surpasses the Rivne Oblast in terms of the volume and positive dynamics of capital investments; according to nominal estimates,

the volume of capital investments increased fivefold during the reporting period, according to real estimates, excluding the effects of inflation, it increased less than twofold and is expected to continue growing moderately; the majority of capital investments are made in tangible assets, while investments in intangible assets are unreasonably low; the predominant source of financing remains the enterprises' own funds; in terms of type of activity, the largest investments are made in industry and construction; the level of investment in environmental protection is insufficient.

The generalised assessment has shown that local budgets have not become an important source of funding for the implementation of the 2030 Sustainable Development Goals in the Northwest region. In general, the inability of local budgets in this region to generate sufficient revenues to finance areas related to the implementation of the 2030 Sustainable Development Goals was identified. After all, they remain 2/3 subsidised and are mainly aimed at addressing current social issues, i.e. financing the social component of sustainable development. At the same time, only about 10% of funds are spent on financing economic activities. The main problem is the very low level of funding (up to 1%) from local budgets for environmental protection activities, i.e. the environmental component of sustainable development in the North-Western region.

Table 2.9

Matrix for selecting a strategy for financial support of sustainable development based on the results of an integrated assessment

Components and SDGs by 2030	**Types of strategies depending on the level of financial support for sustainable development of the region**		
	Low (0,000-0,333)	**Medium (0,334-0,666)**	**High (0,667-1,000)**
1	2	3	4
Social component – total	**Focusing on financing priority measures, attracting additional investments for the implementation of the SDGs under the social component**	**Diversification of sources of funds and areas of investment to finance the implementation of the SDGs by social component**	**Expanding financing instruments for the implementation of the SDGs by social component**
Goal 1: Eradicate poverty	Increase the level of coverage of low-income families with financial assistance from various sources	Increase local budget expenditures on social protection and social security	Increase the minimum wage in Territorial Agreements, increase lending to households
Goal 3: Good health and well-being	Increased capital investment in Healthcare and social assistance and Arts, sports, entertainment and recreation	Increasing consolidated local budget expenditures on Healthcare and Physical Culture and Sports	Reducing the share of household expenditures on healthcare in total expenditures
Goal 4: Quality education	Increase capital investments in Education	Increase in consolidated local budget expenditures on Education	Decrease in the share of household expenditures on education in total expenditures

(End of Table 2.9)

1	2	3	4
Goal 5: Gender equality	Stimulating an accelerated increase in women's wages than men's	Increase in women's salaries in the region alongside data for Ukraine	Ensuring and maintaining parity in remuneration for women and men
Goal 10: Reduce inequality	Active measures to de-shadow the economy, ensure transparency, and increase the income of households from the poorest 10% of the population	Measures to increase the incomes of lower-middle income households	Ensuring and maintaining the parity of wages and disposable income per capita in the region with the national level
Goal 16: Peace, justice and strong institutions	Increase capital investment in public administration and defence; compulsory social insurance	Increase in consolidated local budget expenditures for Prevention and Elimination of Emergencies and Consequences of Natural Disasters and Law Enforcement and State Security	Increase in consolidated local budget expenditures on public administration, as well as average wages in public administration and defence; compulsory social insurance.
Economic component – total	**Focusing on financing priority measures, attracting additional investments for the implementation of the SDGs under the economic component**	**Diversification of sources of funds and areas of investment to finance the implementation of the SDGs by economic component**	**Expanding SDG financing instruments by economic component**
Goal 2. Overcome hunger and develop agriculture	Increase capital investment in agriculture, forestry and fisheries	Increase consolidated local budget expenditures on agriculture, forestry, fisheries and hunting	Attracting additional foreign direct investment in agriculture, forestry and fisheries
Goal 8: Decent work and economic growth	Encourage employers to raise real wages	Stimulating business entities to create new and expand existing value chains	Promoting sales of products, works and services of local producers
Goal 9: Industry, innovation and infrastructure	Increase capital investments in the areas of industry and professional, scientific and technical activities	Increase in capital investments and consolidated local budget expenditures on transport, warehousing, postal and courier services	Attracting additional foreign direct investment in the manufacturing industry
Goal 11: Sustainable development of cities and communities	Increased capital investments in Administrative and support services and Construction	Increase in consolidated local budget expenditures on housing and communal services and construction	Stimulating the growth of own revenues in the consolidated local budget
Goal 17. Partnership for sustainable development	Attracting additional direct investment from non-residents in the region (equity and debt instruments)	Increase the amount of exports of goods and services and ensure that they exceed imports	Increase in the amount of financing of capital investments of enterprises at the expense of foreign investors

(End of Table 2.9)

1	2	3	4
Environmental component – total	**Focusing on financing priority measures, attracting additional investments for the implementation of the SDGs under the environmental component**	**Diversification of sources of funds and areas of investment to finance the implementation of the SDGs by environmental component**	**Expanding financing instruments for the implementation of the SDGs by environmental component**
Goal 6: Clean water and adequate sanitation	Increase capital investment in wastewater treatment	Increase in current costs for wastewater treatment	Increase in rent for special water use
Goal 7: Affordable and clean energy	Increase capital investments in the supply of electricity, gas, steam and air conditioning	Attracting additional investment to increase the capacity of renewable energy sources	Attracting additional investments to increase the capacity of boiler houses using alternative fuels
Goal 12: Responsible consumption and production	Increased capital investment in waste management	Increase capital investments in environmental protection measures in the processing industry	Increase in current expenditures on environmental protection measures in the processing industry
Goal 13: Mitigate the effects of climate change	Increase capital investment in air protection and climate change	Increase in consolidated budget expenditures on environmental protection	Increase the administration of environmental tax to the local budget
Goal 15: Protect and restore terrestrial ecosystems	Increase capital investment in the protection and rehabilitation of soil, groundwater and surface water	Increasing capital investments to preserve biodiversity and habitats	Increase in current expenditures on protection and rehabilitation of soil, groundwater and surface water and conservation of biodiversity and habitats

Note. Created by the authors.

Therefore, given the proximity of this region to the European Union, it is important to significantly expand the sources of local budget revenues through grants, international financial assistance, etc., especially to increase funding for the environmental component of sustainable development.

The main source of funding for the implementation of the socially oriented Sustainable Development Goals in the Northwest region of Ukraine is the regional budgets of Volyn and Rivne oblasts. During 2000–2021, the total amount of funding for social and cultural activities increased significantly, but the priority of funding for certain expenditure items changed significantly in favour of a sharp increase in spending on education (Goal 4), as education funding is the prerogative of local budgets. However, in the future, the region needs to find additional opportunities

to increase budgetary funding for the implementation of other socially oriented Sustainable Development Goals 2030 (Goals 1, 3, 5, 10, 16).

As a result of the study, a methodological approach was developed to substantiate the basic provisions of strategies for financial support of sustainable development of regions. This methodological approach is based on the results of a multi-criteria assessment of the level of their financial support in terms of sustainable development goals, social, economic and environmental components and an integral index. This makes it possible to identify priority areas of the regional economy for further funding within regional strategies, projects and programmes.