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Assessment and Forecasting of Sustainable Regional Development Based on Economic, Social and Environmental Indicators

Yormonqulova Nargiza Ikromjon qizi*¹

1. Basic doctoral student Tashkent State University of Economics

* Correspondence: nargizayormonqulova@gmail.com

Abstract: This article discusses methods that allow a comprehensive assessment and prediction of the level of sustainable development of the regions of Uzbekistan. Economic, social and environmental indicators are used for this purpose. To assess the development of the regions, the following parameters were selected: gross regional product, investment, industrial production and services, household income, wages, employment level, dependence on external transfers and environmental indicators. The normalization method was used to compare indicators in different units of measurement. Based on the data obtained, a Regional Sustainable Development Index was developed, which includes economic, social and environmental components. A methodology has been successfully tested in the Ferghana region, which made it possible to determine the integral index at the level of 0.649. Ideas were also proposed for the formation of a differentiated regional strategy based on predicting the dynamics of the index using panel regression and identifying weaknesses in different regions.

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1. Introduction

At a time when the global economy is undergoing structural changes, when climate risks are increasing, when the use of natural resources is becoming more widespread, and the population's demand for decent living conditions is increasing, it is necessary to reconsider approaches to regional development. Estimating economic growth rates alone does not provide a complete picture of the region's condition. After all, an increase in economic activity can be accompanied not only by an increase in employment and income of the population, but also by an increased burden on natural resources, environmental degradation and increased social differences between regions. Therefore, in modern regional studies, the assessment of economic efficiency, social well-being and environmental balance within a single system is becoming a key methodological tool for studying sustainable development.

In order to assess the level of regional development, it is necessary to develop a system of indicators that will allow analyzing both quantitative and qualitative aspects of economic and social processes in the region. It is important to understand that the rapid growth of the gross regional product or industrial production does not always indicate the uniform development of the region in all areas. Even in regions with high economic

indicators, there may be problems with incomes, employment, infrastructure, or the environment. On the other hand, there may be positive changes in social indicators in regions with limited economic potential. In order to obtain an objective assessment of the region's development, it is necessary to move from the analysis of individual statistical data to an assessment based on an integrated approach.

As part of the large-scale transformations being carried out in Uzbekistan, special importance is attached to the analysis of results using quantitative data and the definition of future goals. The updated strategy "Uzbekistan — 2030", which covers the period from 2026 to 2030, was approved by Decree of the President of the Republic of Uzbekistan dated February 16, 2026 No. UP-21 [1]. This document emphasizes that one of the key tasks of strategic management is to identify performance indicators that will meet real conditions, be measurable and assessable, taking into account the results already achieved and the existing problems. In addition, the decree pays special attention to identifying systemic problems, risks and growth points in various industries and regions based on scientific approaches in the development of strategic planning documents [2].

In order to understand how the region will develop in the future, it is not enough to simply analyze the current results. It is necessary to determine which factors contribute to development and which ones hinder it. Then it is necessary to quantify these factors and predict how they may change in the future. Therefore, the study of regional development should be comprehensive and include several stages: assessment of the current situation, identification of factors, forecasting and development of management decisions.

Determining the level of development of a region is a complex task that requires taking into account many factors and measuring them in various units. The assessment of the economic development of the region can be based on the following indicators:

- gross regional product;
- the volume of production in industry and agriculture;
- scope of services;
- investments in fixed assets;
- export;
- entrepreneurial activity;
- labor productivity;
- per capita income.

The assessment of the social development of the region can be based on the following indicators:

- employment rate;
- the unemployment rate;
- poverty rate;
- level of education;
- availability of medical services;
- availability of housing and infrastructure.

In addition, environmental and natural factors have a significant impact on the development of the region in the future. It is important to consider how we use water and land resources, how we pollute the air, how we dispose of waste and create green zones. It is also important how efficiently we use energy. To conduct a comparative analysis of different regions, it is necessary to collect and analyze all available data.

It is also important to identify differences between regions. In Uzbekistan, these differences are reflected in economic potential and available resources. In some regions, economic development is stimulated by industrial production and investment, in others by agriculture, services, tourism or small businesses. Due to the diversity of the regions, it

is impossible to evaluate them in the same way. Therefore, it is necessary to classify the regions according to the level of development. As a result, groups of regions with similar characteristics will be formed, for each of which it will be necessary to develop an individual development plan.

From this point of view, forecasting is a logical continuation of the analysis of regional development. A retrospective analysis allows us to assess how the region developed in the past and how it currently looks. Forecasting, in turn, provides an idea of how the existing trends will develop in the future. To effectively manage a territory, it is necessary not only to understand the current state, but also to have an idea of future changes. For example, if we can predict how investment activity, household incomes, employment levels, industrial production, or the environmental situation will change in the next three to five years, it will help us make more informed strategic decisions. Therefore, combining the assessment and forecasting of regional development into a single methodological system is of great scientific importance.

Ensuring the sustainable development of the regions is one of the most important tasks facing modern research in the field of regional economics. This process includes a comprehensive analysis of several key aspects: economic growth, social well-being of the population and the state of the environment.

Scientific research shows that assessing the development of a region based only on macroeconomic indicators does not always allow us to fully assess its real sustainability. Modern research focuses on combining economic, social, and environmental data into a single analytical system. This allows for a more comprehensive assessment and forecasting of the region's development trends.

The work carried out by Russian scientists B.B. Berkinov, D.S. Ashurova, M.K. Abdullayeva and J.T. Tavakalov examines the theoretical and methodological aspects of forecasting the socio-economic development of regions [3]. The authors identify three main tasks of regional forecasting:

1. Identification of regional development trends based on the analysis of historical data.
2. Assessment of future changes in economic processes.
3. Development of alternative development scenarios.

This approach allows us to conclude that in order to predict the stability of a region, it is necessary to take into account not only current indicators, but also patterns of their changes over a certain period of time.

In the works of D.S. Odinaev, the issue of the most effective use of the economic potential of the regions of Uzbekistan in the context of the regional economy is considered. The author believes that the effective use of the economic opportunities of the regions is a key factor in their development. This approach suggests that when assessing the sustainability of regions, it is necessary to take into account not only the economic results achieved, but also the efficiency of resource use. In this regard, indicators such as gross regional product, investment, industrial production, entrepreneurial activity and the use of labor resources can serve as key indicators of successful economic development of the region.

In her works, S.T. Toshaliyeva conducts a detailed analysis of methods for improving the efficiency of regional economic development [4]. It explores ways to determine the economic potential of regions, assess their differences and the effective use of available resources, as well as the introduction of innovative approaches. In addition, the author considers the possibility of adapting foreign experience to the conditions of Uzbekistan. This indicates the need to take into account in the methodology for assessing regional development not only universal indicators, but also the economic, geographical and institutional characteristics of each region.

F.E. Kadyrov conducted a study aimed at determining the factors influencing the economic development of the regions. In the course of the research, econometric modeling methods were used [5]. As a result of the study, key factors influencing the economic development of the region were identified. These include investment, employment, industrial production, infrastructure development, quality of education, and innovation. Methods of applying regression analysis, multifactor models, and panel data to analyze regional processes were also considered. The study highlights the importance of identifying functional and statistical relationships between sustainable development indicators using econometric models, rather than just based on a simple statistical comparison.

In their works, D. A. Toimbayeva and D. N. Mamatova explore how the environment affects the stability of regions in the context of economic processes [6]. The authors emphasize that in order to ensure the stable development of the region, it is important to pay attention to social policy, rational use of natural resources, economic competitiveness, innovation and investment environment, as well as financial stability and environmental conditions. The study shows that the level of environmental impact in different regions of Uzbekistan differs. This indicates that when analyzing regions, it is necessary to take into account environmental indicators along with economic indicators.

In his scientific work, Sh. A. Ismatov reveals the topic of how environmental innovations contribute to the sustainable development of regions [7]. It demonstrates that modern technologies and management methods help to use resources more efficiently, reduce negative environmental impacts and improve the socio-economic situation. According to the author, the ecological state of the region should not hinder economic growth, but, on the contrary, becomes an important aspect that opens up new horizons for development through innovation.

E. N. Madenova conducted an in-depth study on the theoretical links between the sustainable development of the region and climate change [8]. In his work, the author relies on the ideas of Bruntland, the concepts of planetary boundaries and the "donation" economy. The study highlights the importance of green growth, resource management, and interregional cooperation to ensure the sustainable development of Central Asia, including Uzbekistan. The author concludes that when developing environmental indicators, it is necessary to take into account not only the level of environmental pollution, but also the efficiency of using water and energy resources, the ability to adapt to climate change, and also take into account aspects of green development.

In the scientific works of foreign authors, one can often find the idea that the analysis of the sustainability of a region is a complex system consisting of three main components: economic, social and environmental. M. M. Magomedova, U. A. Kurbanova and K. D. Dakhdueva studied the region as an ecological, socio-economic system, analyzing the factors, principles and patterns that contribute to its stable development [9]. They used a systematic approach in their research. It is important to note that in their work, the sustainability of the region is considered not as the state of individual economic, social and environmental spheres, but as a result of their interaction. This approach serves as the basis for the development of a comprehensive assessment methodology that allows for a comprehensive assessment of the region.

V. V. Menshutkin and N. N. Filatov proposed a methodology for analyzing and predicting the sustainability of regions, which is based on cognitive modeling [10]. They have developed several models that take into account the complex interrelationships between economic processes, demography, the social sphere, ecology, climate, agriculture and forestry. These models allow us to assess how different management scenarios affect the standard of living of people, the use of natural resources and the economic development of the region. This approach emphasizes the importance of analyzing the

cause-and-effect relationships between indicators when forecasting at the regional level, and not just their individual changes [10].

O. E. Arkhipova, E. A. Chernogobova and K. E. Arkhipova analyzed scientific approaches to assessing the sustainable development of regions both in Russia and abroad [11]. As a result of the study, it was found that it is necessary to develop a scientifically based system of quantitative indicators for retrospective analysis, monitoring and forecasting. The authors divided the indicators that characterize the economic situation, the state of the environment, demographic processes and the health of the population into several groups. However, they noted that most of the existing studies consider only one industry or area. In this regard, the authors emphasized the need to develop a methodology for integrated modeling of regional sustainability.

The work of T. O. Tolstykh and A. A. Shatsky examines the potential of using an integral indicator to analyze and predict industrial growth trends in the regions [12]. The authors study existing approaches to integrated assessment and propose a model that allows forecasting changes in innovation and industrial development. The study demonstrates that integral indicators can be used not only to compare the current state of regions, but also to predict future changes by forming a dynamic range of indicators.

The study conducted by V. Royuela, A. Panori and J. Lopez-Tamayo is an innovative method of using composite indexes in the context of NUTS-2 regions in the European Union [13]. The authors have developed a comprehensive index for regions that takes into account traditional socio-economic indicators and also includes aspects of digital and green development. The methods of normalization, weighting, and combining data were used to create the index. To ensure the reliability of the results, the authors conducted a principal component analysis (PCA) and sensitivity analysis. This approach can be useful for converting economic, social, and environmental indicators expressed in different units of measurement into a single index of dimensionless magnitude.

M. L. Zlati, K. M. Beldiman, I. Vasiliev, V.-M. Antokhi and K. Fortea conducted a study aimed at studying digital differences in regional development. They used modern algorithmic methods in their work [14]. The data for the NUTS-2 European regions for the period from 2012 to 2023 were used for the analysis. The research used methods such as autoencoder, deep clustering, and SHAP. The results of the study showed that human capital, research activities, high-tech employment and the level of higher education play an important role in the technological development of the regions. These conclusions confirm that the inclusion of indicators of education, human capital and innovation activity in the socio-economic blocks of sustainable development is scientifically justified.

J. Zhou conducted a study to find out how deep learning technologies can be used to analyze and predict the economic development of regions [15]. He collected data on China from 2019 to 2024 and developed a model that allows assessing the complex relationships between industrial digitalization, economic efficiency and sustainable growth. In his research, J. Zhou applied a model of a spatiotemporal neural network. This model allowed him to predict the dynamics of the selected resulting indicator with high accuracy. The results of the study show that modern machine learning methods can be useful in addition to traditional econometric models for predicting the future state of regional sustainability.

As a result of the analysis of 62 scientific papers on regional digital transformation conducted by A. Bykova, A.S.T. Sousa and M.G.C. Batista, it was found that digital transformation is closely related to regional innovations, measuring the level of development and regional public policy [16]. The authors of the study noted that the results of digital transformation are largely determined by the unique characteristics of each region. In this regard, when assessing regions, it is necessary to take into account their economic specialization, the level of development of human capital, infrastructure and technology.

A study of the sources indicates that there is a shortage of scientific and methodological developments in this area. Although significant progress has been made in the course of national research in studying the economic potential, socio-economic development, ecological status and "green" development of regions, the issue of a comprehensive assessment of these aspects in the regional context and forecasting their future dynamics using a unified system of economic, socio-environmental indicators remains insufficiently investigated. Complex indexes and modern modeling methods are actively used in foreign studies. However, their adaptation to the peculiarities of economic specialization, demographic situation, resource availability and environmental burden in the regions of Uzbekistan requires the development of new methodological approaches.

2. Research Methodology

The study used a broad, systematic method to assess sustainable growth in various regions of Uzbekistan. Economic, social, and environmental indicators were considered, along with attempts to predict what might happen next. Methods such as system analysis, comparisons between fields, statistical grouping, dynamic analysis, index methods, normalization, integral estimation, and econometric forecasting were all important.

Combining all these aspects allowed us to consider the regions as interrelated elements, with economic efficiency closely related to social well-being and ecological balance. This approach, it is believed, makes it possible to not consider these aspects separately. However, I may be oversimplifying a complex system of relationships.

3. Results

The study of the sustainable development of regions should cover not only the measurement of the economic value created in the region, but also the assessment of the impact of economic activity on the standard of living of the population, investment prospects and the structure of the regional economy, sources of social income and management of the environmental consequences of economic growth. This study examines regional development in the context of three aspects: economic efficiency, social well-being, and environmental balance.

For our study, we relied on statistical data published by the National Committee on Statistics of the Republic of Uzbekistan in the period from January to June 2026 [17]. These data provide comprehensive information about the state of the economy as a whole and in the context of individual regions. In particular, these data provide information on the gross regional product (GRP), investments, services, household income, wages, as well as demographic processes.

The analysis of the macroeconomic situation in the first half of 2026 demonstrates the overall positive dynamics in the country. The gross domestic product (GDP) of the republic amounted to 1,072,670.1 billion soums, which is 8.5% more than in the same period of 2025. This GDP growth indicates the stability of the economy. There is also growth in other sectors.:

- industrial production increased by 8.0%;
- investments in fixed assets increased by 17.5%;
- the volume of construction works increased by 13.8%;
- market services increased by 16.9%.

Retail trade turnover increased by 20.2%. These data were provided by the National Statistical Committee and confirm the growth of trade operations.

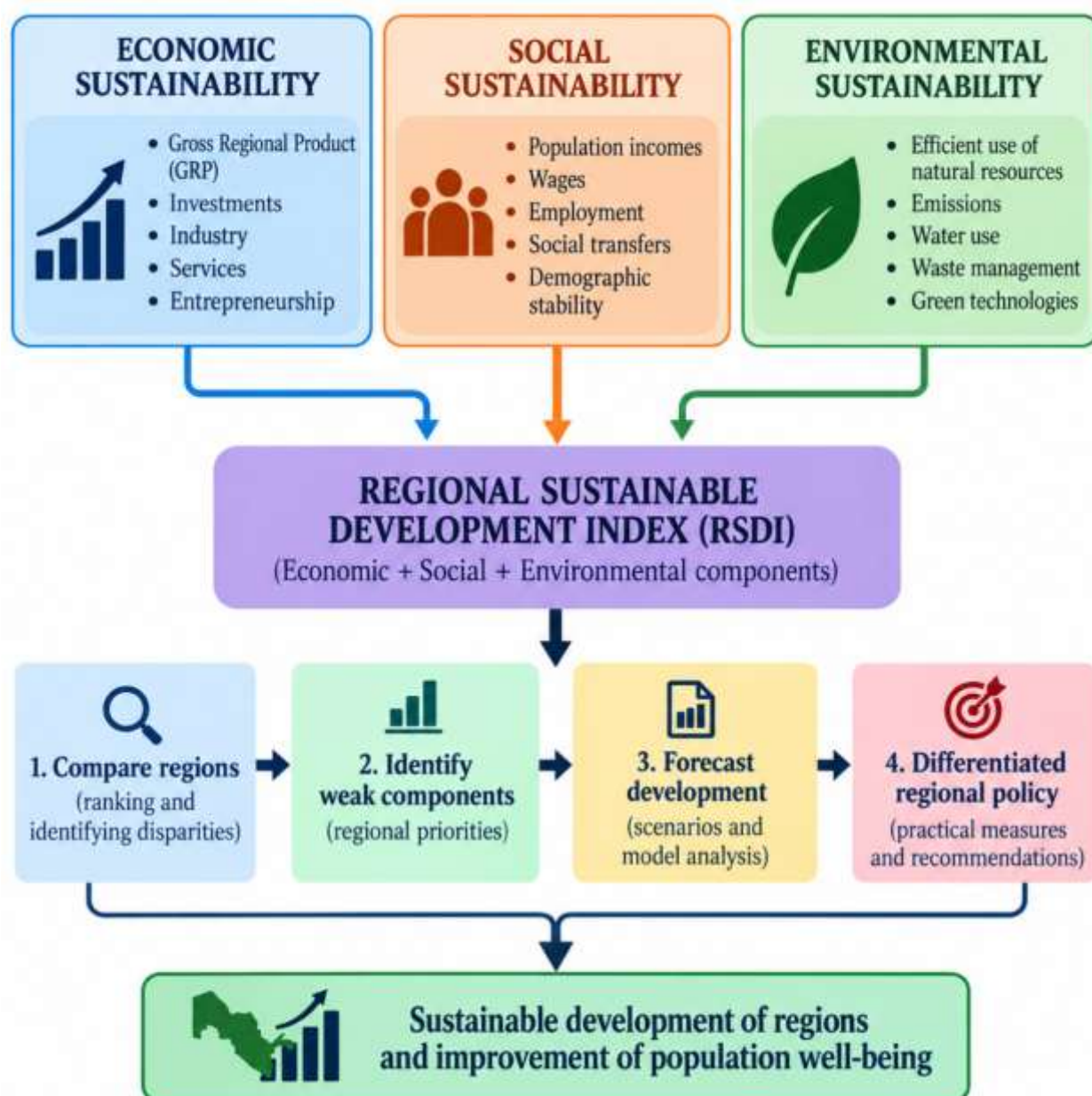
Although there is an improvement in the situation in the whole country, the development of the regions is uneven. This indicates the need to analyze the stability of the regions in the context of individual territories.

Table 1. The gross regional product (GRP) of the regions of Uzbekistan in the period from January to June 2026.

Territory	GRP, billion soums	Real growth, %
Republic of Karakalpakstan	32 383,9	110,2
Andijan	59 619,7	108,8
Bukhara	44 766,0	108,8
Jizzakh	29 694,6	108,6
Kashkadarya	55 712,6	108,4
Navoi	113 870,5	106,7
Namangan	45 540,0	108,3
Samarkand	67 361,0	109,7
Surkhandarya	35 865,3	107,3
Syrdarya	19 147,9	108,4
Tashkent region	103 829,4	108,7
Fergana	65 221,6	109,1
Khorezm	32 933,3	109,1
Tashkent city	226 028,7	113,3

The table clearly shows the key differences between the regions: the size of the economy and the rate of its growth. Tashkent is the leader in terms of gross regional product (GRP) — 226.0 trillion soums. In addition, it showed the highest growth rate — 13.3%. Navoi region ranks second in terms of GRP — 113.9 trillion soums, but its real growth rate was only 6.7%. The Ferghana region, despite a relatively small GRP of 65.2 trillion soums, showed an impressive growth rate of 9.1%. This indicates that the economy of the Ferghana region is developing rapidly. According to official data, Tashkent's share in the formation of the gross domestic product (GDP) of the republic is 21.1%, Navoi region — 10.6%, and Tashkent region — 9.7%.

An important conclusion for the methodology can be drawn from this.: A high gross regional product (GRP) is not a guarantee of stable development. Even if there is a significant volume of production in a region, this does not always lead to an improvement in the environmental situation or a reduction in social inequality between different territories. On the other hand, rapid income growth, increased employment and efficient use of resources in regions with relatively small economic indicators can significantly increase stability. Thus, it is necessary to abandon the simple ranking of territories by GRP and move on to a deeper analysis. In the course of the study, the indicators were divided into three groups.



Scheme 1. Factors contributing to regional stability.

The analysis of the social sector makes it possible to assess the impact of economic growth on the standard of living of the population. In the period from January to June 2026, the average monthly nominal accrued salary in Uzbekistan amounted to 7,091.1 thousand soums, which is 18.4% higher than in the previous year. For comparison, in 2022 this figure was 3,551.6 thousand soums.

The analysis of the income structure of the population allowed us to draw even more significant conclusions. In the first half of 2026, 63.1% of all income was earned through work. Services provided for personal consumption accounted for 6.4%, income from property — 3.8%, and transfers — 26.7%. If we consider income by region, the highest share of income from work was recorded in Navoi region — 77.6%. At the same time, in the Ferghana, Samarkand, Andijan, Bukhara, Surkhandarya and Khorezm regions, this indicator was lower than the national average.

This shows that when assessing the stability of a territory's development, it is necessary to take into account not only the overall income level, but also their structure. For example, in the Ferghana region, transfers from abroad accounted for 24.6% of total

income. In Samarkand, this figure reached 26.8%, in Khorezm — 26.5%, and in Andijan — 26.3%. At the same time, the share of transfers in Navoi region is only 5.0%.

Thus, the long-term socio-economic stability of two regions with the same income level may differ significantly depending on how much these incomes depend on the domestic labor market or on external transfers. Based on these data, the article proposes a system of indicators for calculating the **regional sustainable development index**.

Table 2. The main indicators included in the regional sustainable development index.

Component	Key indicators	Direction of influence
Economic	GDP per capita, GDP growth, investments, industry, services	+
Social	real income, salary, share of labour income, employment	+
Social	unemployment, high dependence on external transfers	-
Ecological	waste recycling, green spaces, renewable energy	+
Ecological	emissions, water and energy intensity, waste volume	-

Since the indicators have different units of measurement, their direct addition would be scientifically incorrect. Therefore, before adding up, it is necessary to bring the indicators to a single range of values from 0 to 1. For positively influencing indicators:

$$Z_{ij} = \frac{X_{ij} - X_j^{\min}}{X_j^{\max} - X_j^{\min}} ;$$

for negatively affecting indicators:

$$Z_{ij} = \frac{X_j^{\max} - X_{ij}}{X_j^{\max} - X_j^{\min}} ;$$

formula is used.

Three sub-indices are then generated:

$$IB_i = \sum_{j=1}^n w_j Z_{ij} ; \quad IJB_i = \sum_{j=1}^m w_j Z_{ij} ; \quad EB_i = \sum_{j=1}^k w_j Z_{ij} ;$$

Final integral indicator:

Regional Sustainable Development Index = 0,35ib_i+0,35ijb_i+0,30eb_i

can be represented as.

In this study, we propose to pay equal attention to the economic and social spheres, assigning them 0.35 each. We allocate 0.30 to the environmental sphere. This proposal is based on the current importance of economic and social changes for the regions of Uzbekistan. In the future, it can be tested in practice using entropy or principal component analysis (PCA) methods.

Using the example of the Ferghana region, one can clearly demonstrate how the regional sustainable development index is calculated. For this purpose, official statistical data and a special method of their processing are used. In the period from January to June 2026, the gross regional product (GRP) in this area reached 65,221.6 billion soums, which is 9.1% higher than in the previous year. It should be noted that the share of remittances from abroad in the income of the population in the Ferghana region is 24.6%, which exceeds the national average.

After normalization of all selected indicators, according to our calculations, the economic subindex of the Ferghana region was 0.74, the social subindex was 0.66, and the environmental subindex was 0.53. These values were obtained in order to demonstrate the effectiveness of the applied methodology and cannot serve as an official statistical index.

Table 3. Sample calculation of the regional sustainable development index of the Ferghana region.

Component	Index	Weight	Result
Economic stability	0,740	0,35	0,259
Social stability	0,660	0,35	0,231
Ecological sustainability	0,530	0,30	0,159
Regional Sustainable Development Index	—	1,00	0,649

$$\text{REGIONAL SUSTAINABLE DEVELOPMENT INDEX}_{\text{Ferghana}} = (0,74 \times 0,35) + (0,66 \times 0,35) + (0,53 \times 0,30) = 0,649.$$

Discussion

The study demonstrates that, although the Ferghana region demonstrates high economic results, it is necessary to pay attention to social and, in particular, environmental aspects in order to ensure overall stability. Another important aspect to consider is the quality of economic growth. In the first six months of 2026, gross value added in the industrial sector increased by 8%, while the volume of activities related to water supply, sanitation, waste collection and disposal increased by 15.9%. This creates a solid foundation for assessing the development of both economic and environmental infrastructure.

For a more detailed analysis of regional sustainability, it is necessary to determine how this indicator will change in the future. To do this, it is proposed to use a panel regression model that takes into account the factors influencing this indicator, as well as the MBRI time series.

According to the calculations carried out, despite the fact that the Ferghana region demonstrates a high level of economic activity, in order to ensure overall stability, special attention must be paid to social and, in particular, environmental aspects.

It is also important to pay attention to the quality of economic growth. In the first half of 2026, gross value added in industry increased by 8%, and in the field of water supply, sanitation, waste collection and disposal — by 15.9%. This creates additional opportunities for a comprehensive assessment of the development of economic and environmental infrastructure.

The results of 2026 are an important foundation for predicting how the situation will develop in the future. The growth of investments by 17.5%, the volume of market services by 16.9% and gross domestic product (GDP) by 8.5% will significantly affect the region's economy. As of July 1, 2026, 38,519.5 thousand people permanently reside in the country. Over the past six months, the population has increased by 286.5 thousand people. This indicates that there is a growing need for new jobs, housing, transport, utilities, and environmental resources. This contributes to economic development.

The study demonstrates that economic growth is not the only criterion for assessing the stability of the development of Uzbekistan's regions. According to data for 2026, some regions are experiencing significant growth in gross regional product (GRP), investment, and services. However, the structure of income generation and dependence on external transfers differ significantly in different regions. For example, in the Ferghana region, the

share of remittances from abroad in the income of the population is 24.6%, while GRP is growing by 9.1%. In the Navoi region, the share of income from work reached 77.6%. These differences indicate that the sustainability mechanisms in these regions are different.

The results of the study show that analyzing the sustainable development of regions using exclusively economic indicators does not allow us to get a complete picture of the situation. Sustainable development implies a harmonious combination of economic efficiency, the standard of living of the population and the preservation of ecological balance. In this regard, it is necessary to move from a simple ranking of regions by the volume of gross regional product or its growth rate to a deeper and more comprehensive analysis that will take into account economic, social and environmental aspects. The article suggests an approach to creating a **regional sustainable development index** that will take into account all these aspects.

Statistical data for the first half of 2026 clearly demonstrate significant differences in the economic development of the regions. In particular, in Tashkent, the gross regional product (GRP) reached 226.0 trillion soums, demonstrating a real growth of 13.3%. In Navoi region, despite the larger GRP of 113.9 trillion soums, the growth rate was lower — 6.7%. In the Ferghana region, the GRP amounted to 65.2 trillion soums, showing a real growth of 9.1%. These figures indicate that the size of a region's economy is not always directly related to its development dynamics. For a more complete assessment of progress in each region, it is necessary to analyze not only economic, but also social, as well as environmental indicators.

In the course of the research, another significant factor was discovered that affects stability in the region — it is not only the income level of residents, but also the sources of their formation. For example, in the Ferghana region, the share of remittances from abroad in the total income of the population was 24.6%, in the Samarkand region - 26.8%, in the Khorezm region — 26.5%, and in the Andijan region — 26.3%. At the same time, in the Navoi region, this figure was only 5.0%. Consequently, when assessing sustainable development, it is necessary to take into account the vulnerability of regions whose incomes depend heavily on external transfers to external economic fluctuations.

During the testing of the methodology presented in the article, the following results were obtained in the Ferghana region:

- the economic indicator is 0.74;
- the social indicator is 0.66;
- the environmental indicator is 0.53.

The overall index of sustainable development of the region was 0.649. At the same time, the economic and social indicators were rated 0.35, and the environmental indicators — 0.30. It is important to emphasize that these data are not official statistics, but are a scientific and methodological tool that allows a comprehensive assessment of the strengths and weaknesses of the region.

Summarizing the results of our research, we can offer several scientific ideas and practical recommendations:

1. For a more in-depth analysis of regional development, we recommend using the regional Sustainable Development Index. This index will not only help assess the success of the regions, but also give an idea of the balance of their development, combining economic, social and environmental indicators into a single measurement system.

2. We propose to change the system of indicators that form the regional index of sustainable development and put them on a scale from 0 to 1 to take into account the direction of their impact. The factors that stimulate development include such indicators as the growth of the gross regional product, investments, real incomes of the population, employment, the availability of green areas and the use of renewable energy sources. Factors that limit development include unemployment, high dependence on external

transfers, emissions of harmful substances into the atmosphere, as well as waste and energy consumption.

3. To improve the accuracy and objectivity of the assessment of the index components, it is necessary to improve the methodology by applying scientific statistical approaches. In the framework of future research, we propose using the entropy method, principal component analysis (PCA) and sensitivity analysis, which will allow us to more accurately determine the weighting coefficients that take into account the specifics of the regions. This, in turn, will make the assessment of the index more objective and reliable.

4. It is necessary to conduct a study of the regions in order to identify their weaknesses. To do this, you can use a complex index. As a result, it will be possible to identify several groups of regions. For example, there are territories with high economic potential, but with low environmental sustainability. There are also regions with good social indicators, but limited economic resources. And finally, there are regions that are highly dependent on external revenues. Such an analysis will help us move from a general strategy for the development of regions to a more individual approach to management.

5. As part of the research, we propose to transform the Regional Sustainability Index (MBRI) from a tool for assessing the current situation into an effective forecasting tool. To do this, we will create a time series of the index and analyze the impact of various factors such as investment, employment, household income, industrial production, demographic burden and environmental indicators using a panel regression model. We will also develop basic, optimistic and cautious development scenarios for a period of three to five years. The article will substantiate the need to use a panel regression model to predict the dynamics of MBRI.

4. Conclusion

The proposed methodology represents an integrated approach to the analysis and assessment of regional development. It includes several stages: assessment of the current state of the regions, comparison of their indicators, identification of problems and trends, as well as the development of individual development strategies for each region. This approach makes it possible to analyze the development of regions, taking into account not only economic indicators, but also aspects such as the quality of life of the population, resource efficiency and environmental sustainability. The application of this methodology can contribute to the timely identification of imbalances in the development of regions, forecasting medium-term trends and developing individual management solutions that take into account the specifics of each region.

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