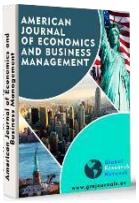

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Article

Statistical Analysis of the Assessment of the Level of Poverty Reduction Based on Socio-Economic Development Indicators in The Kashkadarya Region

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Abstract: More than often, poverty alleviation and socio-economic development fall central in order for sustainable economic growth, social stability and state policy to be well-integrated as manifested under the mission of Sustainable Development Goals (SDGs). The Tashkent financial and economic institute, the mathematical model of regional development and formation of real national indicators in line with international standards are considered in Uzbekistan, as well as an empirical case study of strength234ing employment, entrepreneurship and small business in Kashkadarya region are presented. While national SDG indicators have expanded in recent years, as have policy programs, the integrated statistical and econometric assessment of socio-economic development indicators has not been linked directly through regional level poverty-reduction outcomes. This study design and methodology seek to assess the feasibility, role, and contribution of socio-economic development factors to poverty alleviation, as well as their impact in terms of measurement characteristics. The results indicate that small enterprises, entrepreneurship, job creation in the mahallabay system, and targeted state support programs are statistically relevant to employment and poverty dynamics, according to time-series data and indicator-based analysis. Authors propose a range of indicators that can be both qualitative and quantitative, including labor productivity, employment rate, business activity, poverty rate, and economic activity index for integrated statistical evaluation of sustainable development and poverty reduction. The findings offer an empirical foundation for developing statistical models at the regional level, clarifying indicator sets, and providing evidence-informed policy design for structural change and sustainable poverty reduction.

Keywords: Socio-Economic, Private Entrepreneurship, Business Planning, Social Entrepreneurship, Sustainable Development, Business Model, Economic Growth, Job Creation, Innovative Business Models, Sustainable Business Development, Local Economic Development, Entrepreneurship Support, Business Incubation, Business Acceleration

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1. Introduction

In Uzbekistan, today, special attention is paid to the development of regional economies and ensuring sustainable development of the country's economy, in particular, to the development of the digital economy and statistical modeling of sustainable development of regions, so much attention is paid to the statistical assessment of socio-economic factors that characterize the sustainable development of regions [1][2]. Education and vocational training play a significant role in the long-term model of poverty reduction. Turning people into a skilled workforce increases their chances of finding a job and

improves their income level. Microcredit systems work in the fight against poverty by providing loans to small and medium-sized businesses. This model is especially effective for supporting small entrepreneurs in rural areas. Improving living conditions (for example, building housing, improving sanitation, water supply) is also an important part of poverty reduction [3].

In Uzbekistan, today, special attention is paid to the development of regional economies and ensuring the sustainable development of the country's economy, especially the development of the digital economy and statistical modeling of the sustainable development of regions, so much attention is paid to the statistical assessment of socio-economic indicators that reflect the sustainable development of regions [4].

The importance of the problem is further enhanced by the fact that many regulatory and legal documents, in particular, the National Strategy for the Development of Statistics of the Republic of Uzbekistan for 2020–2025, set out such important tasks as "Introducing international standards and methodologies into the processes of generating data necessary for the preparation of MDG indicators; Strengthening the capacity of ministries and departments responsible for the development and monitoring of MDG indicators; Developing and approving an action plan with specific deadlines for the development of methodologies for national MDG indicators and a monitoring structure" [5]. The effective implementation of these tasks in the republic, firstly, will develop the digital economy through comprehensive statistical indicators, and secondly, will require statistical assessment and modeling of the sustainable development of regions.

Based on the sustainable development potential of regions, it is necessary to conduct strategic research and thereby create a digital economy system, as well as tasks such as developing a system of statistical factors for the sustainable development of the digital economy, which demonstrate the relevance of the article [6].

The Decree of the President of the Republic of Uzbekistan No. PF-5655 dated February 5, 2019 "On approval of the Concept of conducting a population census in the Republic of Uzbekistan in 2020" and the Resolutions of the President of the Republic of Uzbekistan No. PQ-4796 dated August 3, 2020 "On measures to further improve and develop the national statistical system of the Republic of Uzbekistan" and No. PQ-4699 dated April 20, 2020 "On measures for the widespread introduction of the digital economy and e-government" and the Resolution of the Cabinet of Ministers No. VM-841 dated October 20, 2018 "On measures to implement national goals and objectives in the field of sustainable development for the period until 2030" and other regulatory legal acts on the topic of the article This research work serves a certain purpose [7].

The following scholars from abroad have conducted extensive research on sustainable development and its primary goal. In particular:

Simon Dresner has provided a comprehensive and accessible introduction to the interdisciplinary field of sustainable development. He has provided an overview of the origins, evolution, and current state of ideas about sustainability, while also offering analysis and critique [8].

Kirk Hamilton has outlined a set of indicators based on a simple formula that economists can use to generate a rich set of phenomena: sustainability is achieved if development does not diminish in the direction of general well-being [9].

Michael A. Toman and J. Pezzey considered the first objective of sustainable development as follows: people or households strive to maximize their well-being, but this may also be a temporary sum of well-being or profit, and people may use different types of consumption at any given time, including tradable and non-tradable goods (works and services), and they linked it to sustainable development [10].

Scientists from the countries of the Commonwealth of Independent States (CIS) have conducted numerous studies on the sustainable development of regions and their indicators.

M.S. Alekseychuk discussed the possibilities of adapting the sustainable development indicator - the real savings index - to assess the sustainability of regional (territory) development in his research [11].

S.N. Bobilev focused his research on the development and use of sustainable development indicators for Russian regions [12].

Methodological approaches to the development of indicators, international and Russian experience in this field were considered.

S.Ye. Viktorovna The formation of indicators of sustainable economic development of the country is an interacting social system, therefore, ensuring the sustainable development of regions is a priority task [13].

The following scientists of our country also conducted work on this research.

A.N. Nigmatov, N.S. Shivaldova and R.N. Sultanova, "Ecological Aspects of Sustainable Development" manual [14].

S. Mamashokirov and E. Usmanov, "Ecological Safety Issues of Sustainable Development" manual [15].

2. Methods

The methodology of this study is based on quantitative and analytical approach to determine the statistical influence of socio-economic development indicators on poverty level for Kashkadarya region. The study draws upon the secondary data accessed from the Kashkadarya Regional Statistical Agency, the Ministry of Employment and Labor Relations, and national SDGs databases. To investigate trends in employment creation, small enterprise growth, entrepreneurship expansion, and unemployment as well as other socio-economic variables related to changes in levels of poverty, a time-series dataset for the period 2015–2025 was developed. 2) Dependent and independent variables: Dependent variable used was poverty level, employment outcomes; Independent variables: newly established small industrial enterprises, individual entrepreneurs, total small businesses; unemployment; and labor-market indicators Firstly, the analysis used descriptive statistical methods to detect structural changes and growth tendencies through the years. Thereafter, econometric modelling techniques such as correlation and regression analysis were then used to identify the strength and direction of relationships between socio-economic development and poverty. In selecting and processing the indicators, special attention was paid to the principles of representativeness, reliability, periodicity, neutrality and the accuracy of data. The methodological framework also encompassed stages of sustainable development indicator formulation such as systematic data collection, recalculation, interpretation and validation of indicators. Such integrated statistical and econometric approach not only guarantees an objective assessment of performance in sustainable development, but also provides an empirical basis for the design of effective, data-based, and regionally adapted poverty reduction policies.

3. Results and Discussion

In order to achieve the tasks set in the programs and national strategies developed in accordance with national priorities for achieving the Sustainable Development Goals, our country needs to improve the necessary information base and develop its own plans for their development. National indicators are being developed based on the UN recommendations for the formation of indicators for the Sustainable Development Goals:

The national sustainable development goals in our republic are as follows.

Goal 1. End poverty everywhere.

Goal 2. Promote food security, improved nutrition and sustainable agricultural development.

Goal 3. Ensure healthy lives and promote well-being for all at all ages.

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning for all.

Goal 5. Achieve gender equality and empower all women and girls.

Goal 6. Ensure availability and sustainable use of affordable, reliable, sustainable and modern energy for all.

Goal 7. Ensure universal access to affordable, reliable, sustainable and modern energy for all.

Goal 8. Promote sustained and inclusive economic growth, based on productive employment and decent work for all.

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and innovation.

Goal 10. Reduce inequality in all its forms within countries.

Goal 11. Make cities and human settlements clean, safe and environmentally sustainable.

Goal 12. Ensure the transition to smart consumption and production patterns.

Goal 13. Take urgent action to combat climate change and its impacts.

Goal 14. Promote peaceful and inclusive societies, ensure access to justice for all, and build effective, accountable and participatory institutions at all levels, in line with the Sustainable Development Goals.

Goal 15. Strengthen the means of implementation and accelerate work within the Global Partnership for Sustainable Development.

Indicators, which represent any event, are always important for decision-making. They can transform knowledge, mainly from socio-economic sciences, into manageable data and facilitate decision-making. They help measure and quantify progress towards the Sustainable Development Goals.

Based on this, we need to learn how to formulate and implement sustainable development indicators. Table 1 below presents the stages of indicator formulation [16].

Table 1. Key criteria for poverty reduction

Main production indicators	Data collection and processing in the formation of indicators	Calculation and interpretation of indicators
Social growth	Selecting information from available sources	Recalculation of indicators
Social integration	Selected collection within sources	There must be a clear basis for calculations.
Environmental sustainability	Organizing work based on data processing	Explain the calculated indicators.

In our opinion, the principles used in the selection and determination of sustainable development indicators through statistical observations are explained as follows. Goal-orientedness-the ability to identify and systematize indicators through statistical observation and selection of sustainable development indicators and to direct them towards a specific goal. Representativeness - this is the most important concept in statistical sampling, following this concept, the data will be accurate, clear, reliable and statistically significant. Simplicity - simple and clear presentation of indicators in identifying, naming and comparing them to a specific system. Periodicity - this principle

is very important in statistics and econometrics, since the reliability of statistical assessments and econometric models depends on the period. Quality - the data must be developed by relevant ministries and departments. Accuracy - the data must consist of a clearly developed base. Reliability - the data obtained must be free from errors, be truthful and public [17]. Neutrality - it is necessary to approach the processing of data and their impartiality until they become indicators of sustainable development. Accurate assessment–data should be assessed using established statistical sampling methods when statistically observing and selecting.

The practical aspects of determining sustainable development indicators include:

- Relying on the simplified method of indicators in the formation of indicators for decision-making based on sustainable development goals;
- Taking into account changes in nature;
- Identifying shortcomings in the formation of indicators using data and eliminating them;
- Simple formation taking into account different categories of users when using data;
- Exchange of information between organizations and agencies;
- Planning of appropriate measures based on data on a global scale;
- Assessing the activities of organizations and agencies, etc.

Through these aspects, it is planned to form 201 sustainable development indicators in our country. Of these, 117 have been developed by 2020, and 89 are indicators in the process of preparation. It was planned to prepare 18 by the end of 2020, 57 are planned to be prepared in 2021 and 2029, and there are problems in developing 14 indicators. More than 35 organizations and agencies were involved in the development of these indicators. In our opinion, the development of sustainable development indicators requires an integrated approach that requires a lot of time and money to monitor, collect, organize and calculate data based on statistical methods (Table 2).

Table 2. The number of new jobs created at the expense of enterprises established in the Mahallabay system of Kashkadarya region and factors influencing them

Years	Number of new jobs created in the mahallabay system, (thousand people)	Number of small industrial enterprises established in the mahallabay system, in units	Number of small businesses, (thousand people)	Number of established individual entrepreneurs, (thousand people)	Total number of unemployed, (thousand people)	Unemployment rate, percent	Number of districts with high unemployment rate, in units
№	Y	X1	X2	X3	X4		
2015	132,9	401	12,20	6,25	58,3	5,3	171
2016	137,1	464	12,58	6,44	58,3	5,2	171
2017	141,3	530	12,97	6,64	64	5,5	167
2018	145,4	592	13,25	6,85	66,1	5,5	166
2019	150,2	675	13,79	7,06	66,1	5,3	165
2020	154,8	773	14,35	7,27	78,6	6,1	182
2021	159,6	915	16,22	7,50	130,0	9,7	176
2022	164,5	1061	20,30	7,73	125,3	9,3	170
2023	169,6	1184	25,30	7,97	147,7	11,1	162
2024	257,03	1660	36,42	8,33	130,6	9,3	130
2025	421,1	1859	27,98	7,66	96,6	7,3	112

Business incubation is a system that provides support for new entrepreneurs or startups. Incubation programs are often long-term (6 months to 3 years) because they focus on building and strengthening the foundation of a business. Acceleration is a program designed to accelerate business development, and is more focused on companies in the growth stage. Acceleration programs are short-term (usually 3-6 months) because they help the company grow quickly and build relationships with investors. Business incubation and acceleration programs provide entrepreneurs and startups with the resources they need to successfully launch and grow their businesses (Table 2).

Uzbekistan plans to halve the poverty rate by 2026. He noted that halving poverty by 2026, ensuring sustainable high and inclusive economic growth are among the main goals of Uzbekistan's development strategy. The following are planned for this: The head of the Ministry of Economic Development welcomed the new World Bank cooperation program with Uzbekistan for 2022-2026. It is aimed at three strategic goals: creating quality inclusive jobs through private sector development; developing human capital and reducing poverty; improving the livelihoods of the population and increasing sustainable economic development through green development. The minimum consumer spending per capita in Uzbekistan is 498 thousand soums per month (16.3 thousand per day). This indicator is used to determine the poverty line in the country. Currently, there are about 1 million 400 thousand women and young people who are not officially employed in the country. The unemployment rate among women is 13 percent, and among young people - 15 percent. This indicator is higher in Fergana, Samarkand, Andijan, Kashkadarya and Tashkent regions. At the same time, today there is a need for 104 thousand specialists in construction, 71 thousand in the utility sector, 68 thousand in the service sector, and 46 thousand in light industry. It was determined that 70 percent of the funds within the framework of family entrepreneurship programs will be directed to small and medium-sized business projects that provide for the creation of jobs for the poor. It was also stated that enterprises that employ poor people will be provided with favorable conditions for bank loans (Figure 1).

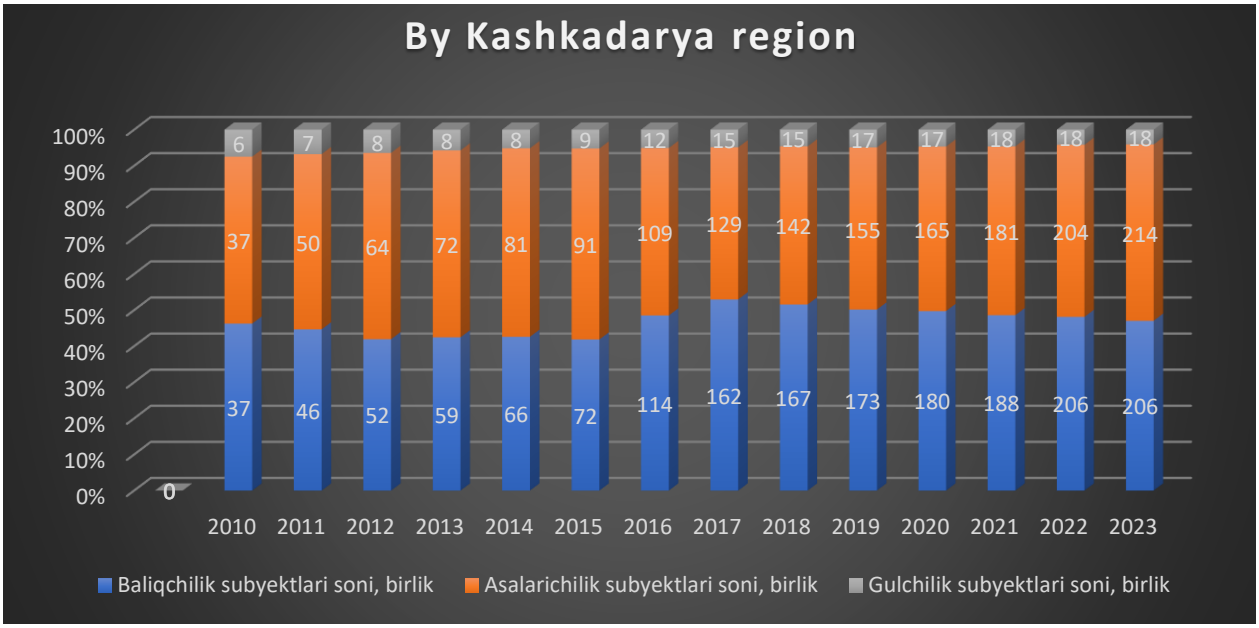

Figure 1. Small business indicators by region of Kashkadarya

This sector is deeply supported by the state. In particular, 13 trillion soums in loans and 1.5 trillion soums in subsidies are allocated annually to develop family entrepreneurship. As a result, 1 million people were lifted out of poverty in 2022, and 210 thousand in the first quarter of this year. Through the systems for identifying the needy

population created in our country and recognized by relevant international organizations for their high efficiency - "Iron Book", "Youth Book" and "Women's Book", as well as the newly introduced "Social Protection Register" in 2023, 2 million 300 thousand families, women, single elderly people and the disabled were fully covered with material assistance. At the meeting, the President emphasized the need to pay special attention to the issue of studying China's experience in reducing poverty. The Head of our state also spoke about this on May 10 of this year when familiarizing himself with the measures prepared to reduce poverty and ensure employment of the population. Over the past period, experienced experts from China were attracted for this purpose, and representatives of the relevant departments visited China and saw how the issue was implemented. It is natural that many people are interested in why we want to use China's experience in reducing poverty. Attention Look: In 1978, 97.5 percent of China's population was poor. By 2019, the proportion of the poor had fallen to 0.4 percent, and in 2021, there were no poor people at all. Two factors played a key role in China's approach to poverty eradication. That is, a targeted strategy for reducing and combating poverty through rapid economic development was developed and consistently implemented. Since the majority of the poor live in rural areas, special attention was initially paid to the rapid development of the agricultural sector. A 1 percent increase in agriculture began to reduce poverty in rural areas by 1.4 percent.

4. Conclusion

In our opinion, it is necessary to develop and simplify the above indicators in a comprehensible way. In addition, the real situation is assessed by analyzing the main qualitative indicators reflecting changes in the results of growth in the national economy. As a result, the developed or developing sectors of the economy are identified.

By identifying areas in the economy that need assistance, assessing them and developing them, structural changes in the priority areas of the economy are ensured, and ultimately the level of poverty of the population will decrease.

Therefore, in our opinion, it is necessary to develop and analyze indicators of qualitative factors for the statistical assessment of the level of poverty of the population and sustainable development, formulate conclusions and make proposals.

We propose the following qualitative indicators to assess the achievement of national goals of sustainable development.

- Labor productivity;
- Business activity;
- Employment rate;
- Labour market tightness;
- Poverty rate;
- Economic activity index;
- Business sentiment index.

Such qualitative indicators are important indicators for an accurate statistical assessment of sustainable development and its primary goal, the level of poverty among the population.

These models, in particular, help to develop socially responsible enterprises, while contributing to maintaining socio-economic stability in poverty reduction.

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