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Expanding Effective Employment Based on the Development of the Renewable Energy Sector in Uzbekistan

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Abstract: The article examines ways to ensure inclusive and sustainable development based on effective employment. The main characteristics of effective employment and the mechanisms of its provision are analyzed. The level of employment, wages, working conditions and its prospects in the field of renewable energy are studied. Prospects of solar and wind power stations in Uzbekistan and employment of the population are analyzed. It was determined that a 1% increase in productivity in agriculture in Uzbekistan changes the structure of employment by a total of 0.32%, and in industry and services it affects the change of employment by 0.14% and 0.04%, respectively.

Key word: demographics, inclusive and sustainable development, climate change, productive employment, labor productivity, employment elasticity, employment reallocation, employment in the renewable energy sector

Introduction. Economic-political, socio-demographic, new technological and climatic changes are being manifested on the international scale. The importance of investment and innovative economic growth models is expanding. The structure of the economy is being adapted to the requirements of the "green" economy, the structure of employment is changing, its flexibility is increasing, preference for non-standard forms over standard forms is increasing. In this context, it is urgent to assess their impact on sustainable inclusive economic growth, decent work and determine reforms.

Digitization of the economy, the process of globalization affects the activity of the labor market. It is reshaping the national economy and creating employment reallocation. The transition to an economy that takes into account climate change provides an opportunity to achieve stability of the labor market and helps to reduce the negative effects of globalization, technological changes, limited resources, and demographic changes.

Total jobs in the energy sector are projected to reach 100 million by 2050, with 42 million of those in the renewable energy sector (IRENA, 2020a).[1] Scenarios have been developed that by 2050, employment of the world's population in the energy sector will reach 87 million, and 25.6 million of them will be in renewable energy. According to it, job losses in fossil fuel industries will be offset by gains in renewable energy sources, along with new job creation related to energy flexibility and grid development. Moreover, Paris Agreement, countries aim to ensure that global warming does not exceed 1.5 degrees Celsius and increase socio-economic benefits.

It is worth mention that the research by the International Renewable Energy Agency, the return on investment in the renewable energy industry is projected to increase GDP by 2.5 percent by 2050 and increase global employment by 0.2 percent compared to employment in traditional business activities.

The purpose of the study is to conduct a comparative analysis of the theoretical foundations of sustainable inclusive economic growth based on the expansion of effective employment as well as the development of the renewable energy sector. To develop methodological, scientific and practical proposals for the assessment of effective employment indicators.

[1] IRENA and ILO (2021), Renewable Energy and Jobs – Annual Review 2021, International Renewable Energy Agency, International Labour Organization, Abu Dhabi, Geneva.

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Methodology. The article used the methods of systematic and strategic analysis, scientific abstraction, induction and deduction, economic-statistical generalization and comparison, practical-observational analysis, and expert evaluation.

Effective employment means social and economic purposeful distribution of jobs that are socially acceptable, bring decent income to the population, ensure the growth of the educational and professional level of the able-bodied citizens based on the growth of social labor productivity. It is employment in the formal sector that creates the correct distribution of the population by sectors and fields of the economy, which preserves the health of the employed.

There are some studies on providing effective employment in the field of renewable energy by Czako, V. (2022), LMI Humber (2019), Cantore et al. (2017), Lehr et al. (2016), Henriques et al. (2016). For example, Cantore assessed the direct and indirect impact of this sector on employment in his work entitled "Promoting renewable energy production and energy efficiency in Africa: employment generation and cost-effectiveness assessment". Lehr et al studied the development history, production and consumption of biogas, wind, solar, solar water heating and photovoltaic energies in the renewable energy sector in their scientific paper "Employment and efficiency in the renewable sector in Tunisia - new perspectives, new results". Henriques used input -output analysis to examine the direct, indirect and coercive effects of the sector on employment in his research on the employment impact of renewable energy production to 2020.

In our study, innovation in the energy industry in Uzbekistan, labor productivity, increased investment, and the provision of various incentives by the government to sectors that have increased the consumption of renewable energy, have been studied to increase the level of employment as a priority field of economy to create new workplaces in the renewable energy sector.

Steps for determining priorities for effective employment over the sectors:

1. Evaluation of employment through groups of socio-economic indicators;
2. Determination of priorities for increasing effective employment by region;
3. Priority directions for increasing effective employment by networks;
4. Econometric assessment of the effect of effective employment on inclusive economic growth;
5. Based on the obtained results, determining the priority direction of employment provision (Fig. 1).

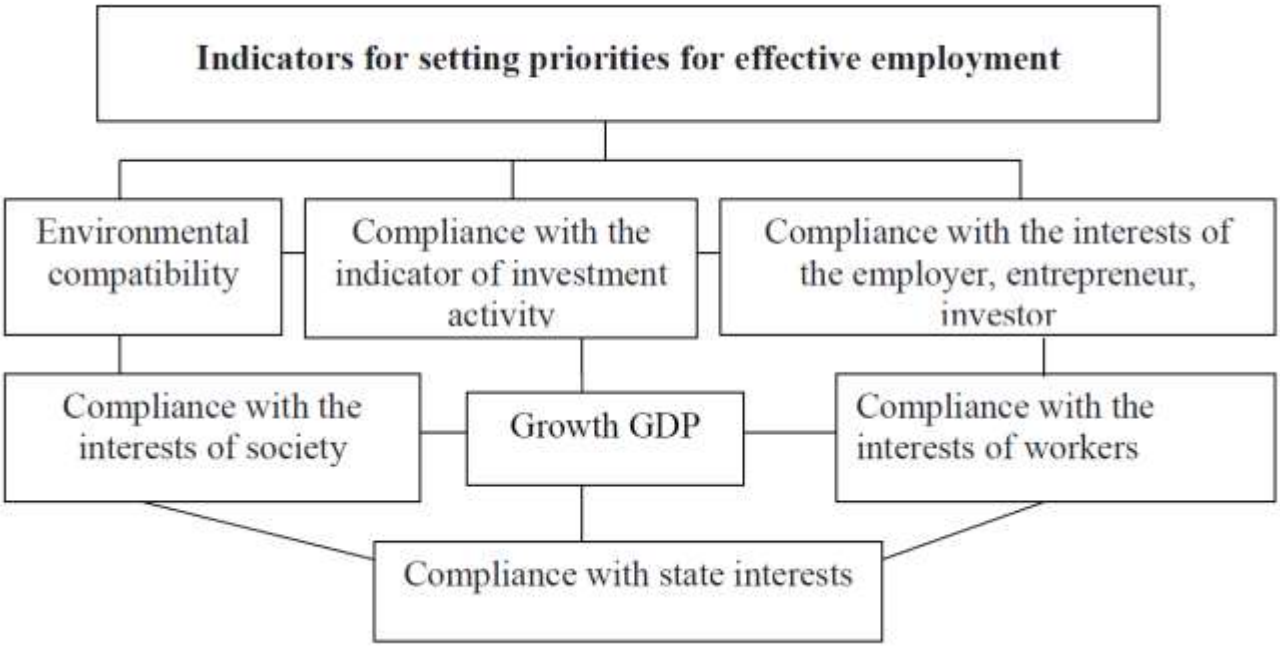

Figure 1. A system of setting priorities for ensuring effective employment

The renewable energy sector is the main direction in order to increase the demand for energy and ensure energy, economic, ecologic security and increase the standard of living of the population. Increasing investments in the renewable energy sector will also increase the level of employment and is a key state

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socio-economic policy. There is a high potential for employment in the field of energy development, construction, installation of renewable energy devices.

Results and discussions. It is known that the share of toxic substances in the creation of traditional energy supply is high compared to other sectors. In 2019, employment in the green energy sector in the US - renewable energy, energy efficiency, low environmental impact vehicles and fuel jobs - reached 3.3 million.

Jobs related to green energy are widely distributed across industries, namely construction, manufacturing, electrical, public service, trade, and financial sectors.

The role of geologists, geographers and politicians will also increase.

According to BW Research Partnership (BW Research), green energy jobs have a three-fold advantage: Firstly, green energy jobs earn 25 percent more than the national median hourly wage. Secondly, it is more profitable in terms of health and social security compared to other private sectors. Finally, there is a high level of integration of labor market participants in the field of green energy.

In general, employment in the field of green energy has advantages in terms of quality of work, health, wages and social security. In addition, it covers the degree of interaction between education, science and innovative technologies, demographic distribution, and the demand for educational level.

According to foreign experience that the USA, China and others green energy wages are higher than the median wages for sales, service and residential jobs. The median wage for coal, natural gas, and petroleum fuel industries is $24.37 an hour, while the median hourly wage for solar and wind energy jobs is $24.85 (Wind energy workers earn 36 percent more than the median wage).

The main and dominant element of climate warming is CO_2. In 2020 to 2060, China formulated the goal of making the country carbon neutral. Technological innovation increases the use of renewable energy and increases the efficiency of coal, oil, natural gas use (Chen et al., 2018). Green technologies are decarbonization technologies, low energy consumption technology, renewable energy technology (Du, Li, Yan, 2019, Hottenrott, Rexhäuser, Veugelers, 2016). Green growth and low-carbon development practices are being implemented in China based on the application of industrial achievements, increasing the employment of the workforce in the digital economy (He et al., 2020).

In addition, the country has also focused on renewable energy system, digital transformation, artificial intelligence, public transport, electric mobiles, etc.[2]

As it is known, according to Chapter 3, Goal 22 of the new development strategy of Uzbekistan for 2022-2026, a plan has been developed to increase the production volume of industrial products by 1.4 times by continuing the industrial policy aimed at ensuring the stability of the national economy and increasing the share of industry in the gross domestic product.[3]

Uzbekistan has set national goals and tasks in the field of sustainable development until 2030, and its 8th goal is to support sustainable and comprehensive economic growth based on increasing effective employment and providing men and women with decent work. 8.3 - to provide the population, especially young people, disabled people with decent work and effective employment by implementing active and passive measures in the labor market, protecting private property, supporting small and large businesses and private entrepreneurship, and eliminating obstacles to rapid development creation of favorable conditions aimed at expansion is defined.[4]

In addition, the law "On the use of renewable energy sources" was adopted in Uzbekistan, creating a legal basis for the development of this sector. Currently, solar photoelectric power stations are operating in Navoi and Samarkand regions. As of 2021, the share of renewable energy sources in the total volume of electricity production has increased to 10%, and it is planned to increase this share to 25% by 2025. In the

[2] Hongye Sun. What are the roles of green technology innovation and ICT employment in lowering carbon intensity in China? A city-level analysis of the spatial effects. Resources, Conservation and Recycling Volume 186, November 2022, 106550

[3]Appendix 1 to the Decree of the President of the Republic of Uzbekistan dated January 28, 2022 No. PF-60

[4]Decision of the Cabinet of Ministers of the Republic of Uzbekistan. On measures to implement national goals and objectives in the field of sustainable development until 2030. No. 841. 20.10.2018 https://lex.uz/docs/4013356

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future, it is planned to commission such solar power stations in Khorezm, Bukhara, Kashkadarya, Namangan and Fergana regions. In 2022-2024, it is planned to build 10 solar and wind power plants with a total capacity of 3,000 megawatts at the expense of 3 billion dollars of foreign direct investment.

Measures have been developed to increase the total capacity of solar and wind power plants to 8,000 megawatts by 2026. This, in turn, serves to increase the level of employment of the population in the field of renewable energy.

According to statistics, the number of permanent residents of the Republic of Uzbekistan in 2022 will be 35,271.3 thousand people, which has increased by 44.4% compared to 2000. It increased by 19.3% in the last decade, and by 8.1% in five years. In 1991-2020, the permanent population increased by 1.64 times or 103.2% on average per year. Labor resources increased by 1.97 times or annually 104.5% on average.

In 1991, the number of working-age population was 49.2 percent, and by 2020, its share reached 62.7 percent. It can be determined that the wave of the share of people older than working age in the composition of labor resources returns every eight years. In particular, the share of working-age people in the total labor force increased from 7.6% in 1991 to 8.1% in 2013, and this indicator was equal to 8.1% in the last decade.

The share of urban residents in the total population was 50.5%, rural residents 49.5%. Analyzing the age structure, 30.3% of the permanent population is below working age, 59.5% is working age and 10.2% is older than working age.

In the Republic of Uzbekistan in 2020, 81.1% of those employed in the economy worked in the non-state sector, 18.9% in the state sector. In Uzbekistan in 2015-2020, it was on average 26.9% in agriculture, forestry and fisheries, and a stable 13.5% in industry. The share of the employed population in agriculture decreased from 27.6% to 26.9% in 2015-2020 (-1%), and although the share of the employed population decreased in the service sector, the share of employment in newly emerging types of service increased.

Changes in the structure of the employment network are influenced by labor productivity, employment elasticity, and the level of skill of labor resources. [5] Currently, the role of digital transformation, mechanisms of transition to a green economy and the increase in the volume of investments made by employers in scientific, technical and innovative developments and the introduction of start-up projects into practice is increasing.

Table 1 shows changes in labor productivity and cross-industry employment over the years. The level of employment has increased in economic sectors with increased productivity. In particular, in 2015-2020 productivity in agriculture increased by -43.9, in industry - by 148.6, and in services - by 69.9. Employment in agriculture decreased by 2.8, and employment in industry and services increased by 2.3 and 2.9, respectively.

Table 1.

Changes in average annual productivity and employment in Uzbekistan in 2013-2020

Changes in real GDP relative to the population employed in the economy:								
Year	**Increased cross-network productivity**				**Changes in the structure of employment**			
	Agri-culture	**Industry**	**Service**	**Total**	**Agri-culture**	**Industry**	**Service**	**Total**
2013-2014	3,65	6,91	18,33	28,88	3,7	2,0	1,7	7,4
2014-2015	4,48	6,80	5,19	16,47	2,1	1,9	1,6	5,5
2015-2020	43,86	148,60	69,93	262,39	-2,8	2,3	2,9	2,4

According to the results of the analysis, in 2010-2015, employment in industrial production sectors decreased at the rate of 0.30 points per year, and in 2015-2020, it increased at the rate of 0.20 points. In the construction sector, the speed increased by 0.50 points during these two periods. It can be seen that the intensity of expansion has increased somewhat.

[5] Adetunji Adeniyi. Factors Affecting Sectoral Employment in Nigeria during the Period of Growth (1981-2014). International Journal of Learning and Development. ISSN 2164-4063.2021, Vol. 11, No. 2

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Table 3.
Forecast of employment, productivity and economic growth in the Republic of Uzbekistan for 2022-2026 (in %)

Indicators, %	Observed period, year			Forecast period, year				
	2010	2015	2020	2022	2023	2024	2025	2026
GDPgrowth	107,30	107,40	101,60	103,80	103,40	102,90	102,50	102,10
Labor Productivty	100,00	114,51	117,77	118,90	119,20	119,50	119,80	120,10
Empoyment Agriculture	26,80	27,60	26,40	26,66	26,61	26,56	26,51	26,45
Emloyment Industry	13,80	13,50	13,70	13,5	13,48	13,46	13,45	13,43
Employment Consrtruction	8,90	9,40	9,90	9,83	9,92	10	10,09	10,18
Employment Service	50,50	49,50	50,00	48,28	48,12	47,96	47,8	47,64

This, in turn, increased productivity and changed the structure of employment in the agricultural sector. Economic growth has slowed due to the impact of the COVID-19-20 pandemic. Forecast indicators for all sectors of the economy, productivity and economic growth until 2026 are presented. In the next five years, the share of employment in the industries, services and tourism will increase. Employment in the renewable energy and chemical industry will increase significantly (table 3).

Conclusion. The growth of labor productivity was positively influenced by the growth of productivity in industries. Productivity increases in industries and employment changes have a positive correlation. A 1% change in employment leads to a 0.58% increase in productivity.

A 1% increase in productivity in agriculture changes the structure of employment in industries by a total of 0.32%. In industry and services, respectively, 0.14% and 0.04% affect employment change. The level of employment has increased in the sector of the economy with increased productivity.

The transformation of rural areas into urban areas, changes in rural lifestyles, and improvements in infrastructure in rural areas have affected demographic trends and population employment. The increase in GDP per capita has a direct correlation with indicators such as productivity, the level of economic activity of labor resources, knowledge, skills, and health of the population of working age.

As a result of the impact of innovative economic growth factors on the GDP growth rate, it is necessary to implement the following in order to support the employment of labor resources and ensure sustainable inclusive economic growth in the context of changes in employment between economic sectors:

- it is necessary to determine the specializations for the expansion of the field of renewable energy and the educational directions of their preparation;
- offer property and land tax incentives to consumers who increase their consumption of renewable energy;
- further expansion of labor productivity improvement in service and science-intensive employment types.
- using the achievements of the 4th industrial evolution in reducing the burden of employment in vulnerable employment and hazardous work. Inclusive development has been adversely affected by the weight of the working poor.
- it is necessary to pay attention to the environmental component of sustainable development and reindustrialize based on subsidizing and automation traditional agriculture with high population employment and attracting financial market assets.

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