

Interrelated factors influencing the human development potential in the Central region of Mongolia /For example Umnugovi province/

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ABSTRACT

This article examines the main factors of human potential formation. There is a gradual increase in the human development index in the Umnugovi region. This is due to the influence of various factors that are closely interrelated and have varying degrees of manifestation at the regional level. To assess the degree of influence of factors on human development, a selection of indicators characterizing the situation in the region was made. All indicators are aggregated into four groups of factors and given a total value in the range from zero to one, which allows for a quantitative assessment of the factors. This makes it possible to assess the degree of influence of a particular factor on human potential development, as well as to identify the main problems, the solution of which will contribute to further improvement of human development.

KEYWORDS

Factor, Human potential, Estimate, Umnugovi

1. INTRODUCTION

Umnugovi is located in the extreme south of Mongolia, in the Gobi Desert. Along its southern border runs the state border with China, with which the region is connected by economic and trade relations. The area of the Umnugovi aimag is 165,381 km². The population density of 0.5 people/km² is one of the lowest in Mongolia. The administrative center is the city of Dalanzadgad.

The aimag has large deposits of ore minerals, primarily copper and gold, as well as high-quality coal (the Tavan-Tolgoi deposit). The Umnugovi region belongs to the so-called areas of new resource and industrial development, characterized by a narrow specialization in raw materials and influenced by unfavorable natural and economic and geographical factors. This means that it is an important economic region in the country. Therefore, it is important to pay attention not only to the resource development of the territory, but also to the socio-economic development of the region, improving the quality of life of the population and human potential, as the main strategic factor of regional development.

Human potential is the development of a person through the expansion of opportunities for choice due to an increase in life expectancy, education and income [1]. In other words, human potential is an integral assessment of the properties of the population of a territory, reflecting the level and possibilities of human development under certain natural, ecological, socio-economic, political and legal conditions. The United Nations Development Programme's human development reports traditionally contain information on the Human Development Index (HDI), which is calculated annually by UNDP experts together with a group of independent international experts. The index used is a cumulative indicator of the level of human development in a country, which is usually used as a synonym for concepts such as "quality of life" or "standard of living". It was first developed by Pakistani economist Mahbub ul-Haq in collaboration with Nobel laureate Amartya Sen and other leading development thinkers for the first "Human Development Report" in 1990. It was introduced as an alternative to traditional indicators of national development, such as income levels and economic growth rates. The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing a country's development, not just economic growth. The HDI is calculated directly on the basis of a minimum set of basic indicators, which are regularly calculated using a comparable methodology for the countries of the world [2].

Currently, the Human Development Index is calculated not only at the country level, but also at the regional level. Table 1 shows the dynamics of the human development index of the Umnugovi region, which shows a decrease in human potential from 2013 to 2017, but over the past 6 years, the HDI has increased 1.2 times, indicating an improvement in the conditions and quality of life of the population [3]. The development of the region is determined by a number of factors, prerequisites and conditions. The purpose of our work is to assess the influence of factors on the development of the human potential of the Umnugovi Aimag.

Table 1. Dynamics of the Human Development index of the Umnugovi Aimag, 2013-2023 [4]

2013	0.697
2014	0.691
2015	0.684
2016	0.674
2017	0.673
2018	0.679
2019	0.683
2020	0.704
2021	0.706
2022	0.696
2023	0.724

2. RESEARCH METHODS

To assess the impact of factors on human development, it is necessary to select indicators that make it possible to most adequately characterize the situation in the region. The development of human potential largely depends on the development of the territory. To do this, we will identify four main factors – demographic, economic, social and environmental. These factors include several indicators (Table 2). When selecting the indicators, the availability of a statistical database for the region was taken into account, as well as their informative value. The identification of groups of factors and the inclusion of an indicator in one of the groups is subjective [5].

Table 2. Indicators for assessing the factors of human potential development in the Umnugovi Aimag

Factors	Indicators
Demographic	Fertility rate (%)
	Mortality rate (%)
	Migration growth rate (%)

Economic	Demographic burden rate (%)
	Life expectancy (years)
	Registered unemployment rate (%)
	Average monthly salary of employees of organizations and business units (tugriks)
Social	Cost of living (tugriks)
	population density (persons/km ²)
	Area of land owned by citizens, based on the total number of landowners (ha)
	Central and individual water supply system
Environmental	Average Annual concentrations of pollutants in the air, mg/m ³

To give a comprehensive assessment of each group of factors, it is necessary to aggregate the selected indicators. The difficulty lies in the fact that the indicators are expressed in different units of measurement, which makes it difficult to reduce them to a single value. To solve this problem, the method of standardization of coefficients was used, that is, the ratio of the values of the indicator of the region with the best value among all regions in the country. Then the obtained coefficients are combined into an integral indicator as an arithmetic mean for all groups of factors.

The following formulas were used to calculate the standardized coefficient:

For direct indicators:

$$k_i = \frac{x_i}{\max(x_i)}, \quad (1)$$

where x_i - is the value of the region's quotient;
 $\max(x_i)$ - is the maximum value of the indicator among all regions of the country.

For inverse indicators:

$$k_i = \frac{\min(x_i)}{x_i}, \quad (2)$$

$\min(x_i)$ - is the minimum value of the indicator among all regions of the country; x_i - is the value of the region's private indicator.

Bringing the values of each group of factors to a common indicator allows not only to compare the degree of their influence on each other, but also to determine the strength of the influence of the totality of all factors in a given territory. To calculate the

integral indicator, you should find the arithmetic mean of all the factors using the formula:

$$F_{\text{общ.}} = \frac{1}{4} (\sum_{i=1}^4 f_i), \quad (3)$$

f_i - is the integral indicator of each group of factors.

According to the degree of influence of a combination of factors on human development, a ranking was conducted with the allocation of five groups with the following values of the indicator: high (above 0.800); above average (0.600–0.799); medium (0.400–0.599); below average (0.200–0.399); low (below 0.200).

Thus, by quantifying the impact of the main factors on human development, the degree of favorable living conditions for the population in the Umnegov region has been determined.

3. RESULT AND DISCUSSION

Currently, much attention is being paid to the problems of human development. The basic components of human development, outlined in the United Nations Development Program, determine a person's ability to live a long and healthy life, acquire knowledge and have material resources to ensure a decent standard of living [5]. In this case, the main aspect is to expand opportunities for human development.

The role of factors influencing the development of human potential and its individual components – health, education and income of the population, is characterized by significant diversity, depending on the natural, environmental and socio-economic conditions of life. In this paper, an attempt is made to assess the influence of factors on the quality of life of the population of the Umnogovi region.

According to the results of the assessment of the demographic factor, calculated on the basis of standardized birth and death rates, migration growth, demographic burden and life expectancy, the impact on the human development of this territory is above average (0.721) (Table 3). Among the indicators characterizing the factor, it should be noted the rather high life expectancy of the Umnugovi region, which in 2023 amounted to 73.4 years (0.977). Life expectancy reflects the health status of the population, which is an important condition for human development. This indicator focuses on all the features of the social development of society and replaces many other values that characterize the state of medicine, healthcare, morbidity of the population, etc. The predominance of the working-age population (0.902)

and a relatively high birth rate (0.863) also had a positive impact. However, the region has a high mortality rate (0.241).

Table 3. Quantitative assessment of the human potential development factors of the Umnugovi Aimag, 2023

Factors	Indicators	Value	Coefficient
Demographic	Fertility rate (%)	2,15	0.863
	Mortality rate (%)	1,99	0.241
	Migration growth rate (%)	2,16	0.621
	Demographic burden rate (%)	60,08	0.902
	Life expectancy (years)	73,42	0.977
Economic	Registered unemployment rate (%)	251	0.267
	Average monthly salary of employees of organizations and business units (tugriks)	2,383.9	0.951
	Cost of living (tugriks)	272300	0.869
Social	population density (persons/km ²)	0,5	0.004
	Area of land owned by citizens, based on the total number of landowners (ha)	76,56	0.413
	Central and individual water supply system	3151	0.212
Environmental	Average Annual concentrations of pollutants in the air, mg/m ³	0,3	0.667

The economic factor ranks second in terms of its impact on human development in the Umnugovi region. This was primarily due to the relatively high salaries of employees of organizations (0.951). Perhaps this is due to the developing mining industry

in the region. One of the main problems in the region remains the high unemployment rate (0.267).

An analysis of the current situation on the labor market indicates a professional imbalance in the supply and demand of labor, the discrepancy between labor supply in terms of the professional qualification structure and the requirements of employers, which is highly focused, specialized in nature related to exploration and mining, and the shift method of attracting labor is often used.

Social development in the Umnugovi region. To quantify the social factor, the following indicators were selected: population density, the area of land owned by citizens, based on the total number of landowners, central and individual water supply systems. Thus, it is possible to judge the development of the territory, which is one of the main parameters of the quality of life of the population. The assessment of the social factor characterizes the degree of favorable living conditions for the population as a average (0.209). The region has one of the lowest population densities (0.5 people/km²), despite the development of the extractive industry. This is more than 4 times less than the average population density of Mongolia. It should be noted that a characteristic feature of modern development of new territories is, first of all, the formation of industrial infrastructures, and such an indicator as population density has lost its former significance. The indicator of the central and individual water supply system, which is quite low in the region (0.212), was used as a characteristic of housing improvement.

The average annual concentrations of pollutants in the air, which have an impact on public health as an important component of human development, have been selected as the main indicator of the environmental factor. The air quality in the surface layer of the atmosphere depends on meteorological conditions that contribute to the accumulation or dispersion of pollutants, as well as on the amount of incoming pollutants [6]. Increased concentrations of pollutants in the atmospheric air (solids, sulfur and nitrogen dioxides, carbon and nitrogen oxides, and specific pollutants) have a negative impact on ecosystems and human health. The Umnugovi region occupies an average position in the country in terms of the amount of pollutants (0.3 mg/m³).

Thus, when assessing the impact of factors on the development of the human potential of the Umnugovi aimag, it should be noted that the demographic factor has the most beneficial effect (0.721), followed by the economic (0.696), environmental (0.667), and the lowest influence of the social factor (0.209). Overall,

the integral score of all factor groups is 0.573 (average impact).

In order to achieve the highest indicators of human development, it is necessary to ensure a balance of the influence of environmental, demographic, social and economic development factors. The integrated socio-economic development of the region, increasing its human potential is ensured by the balanced development of production, the social sphere, stimulating the reproduction of the population, the rational placement of economic, social facilities and the settlement of people, optimizing the formation of centers and peripheries and strengthening their interaction.

It should be noted that the factors are closely interrelated, but the results obtained will allow us to see the weakest points that the leadership of the region needs to pay special attention to in order to solve this problem in order to increase human development.

4. CONCLUSION

The results of the research show that the main factors influencing the development of human potential are environmental, climatic, demographic, socio-geographical and economic factors. Integrating these factors makes it possible to comprehensively evaluate the regional and local human potentials. Also, by studying the impact of certain factors on human development, it makes it possible to determine the main problem of human development and capacity improvement. The development of any country is completely dependent on human development. Then it is necessary to ensure the balance of the above 4 factors. In the future, taking out the indicators of human potential and development in each region of Mongolia will have an effective impact on the local economic plan and development.

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