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### **THE HUMAN DEVELOPMENT OF KRASNOYARSK KRAI**

*SUMMARY. One of the key factors affecting the competitiveness of the economy of the region is labour and its development. Currently, there are many different indexes, components and means of computation of the human potential of the company / region / country. The main essence of a number of terms and definitions of the development of human potential is a continuous process of growth in opportunities to reach a certain level and wealth. The integral index of the development of human potential (IIDHP) can be considered as an adequate indicator that measures the implementation of human goals and development. This index is calculated for the Krasnoyarsk Krai; the results of the calculations reveal a weak institutional element. The position of the region is calculated with regard to the regions of the Siberian Federal District. Calculation of the index of the development of human potential leads to the conclusion that there is unoccupied and unused potential in the economy of the region. The date to achieve the perfect value of IIDHP is calculated and the forecast of the development of the weak element is made up to 2014.*

*KEY WORDS. Human resources, human capital, human potential, the choice of indicators.*

Labour, as the efforts of human capabilities used in the production of goods and services, has obtained special value in these days of post-industrial development and new economy among other economic resources. Generally, the quality and quantity of labour defines the wealth of nation, state power and the competitiveness of the economy.

The tendencies of the last years show a shift in emphasis in the structure of the primary factors of production from material factors to labour and the acquired skills and knowledge of people. Thus arises a new problem. The main difficulty is that the notion has a more intuitive meaning, but common understanding of the notion has not been reached. Due to this, many investigations are being carried out and many definitions suggested. As an example, the following terms can be presented: human potential [1; 391], human capital [2; 46], intellectual capital [3; 384], workforce potential [4; 230], performance potential [5], labour resources [6; 37], among others. It is not difficult to understand what meaning it may have for forecasting labour costs and amount of labour resources and analysing its development.

The interpretations of labour and entrepreneurial skills as economic resources by different establishments and analysts differ from each other as they are based on different approaches and definitions. For example, in [1; 391] human capital (HC) is considered as «an estimation of human potential for profit». In [2; 46] HC is considered

as a structural element of intellectual capital (IC). The definition «human capital» has been used in print since 1962. It was suggested to include in this definition not only labour power in the qualification but also the management and connections with high-paid specialists in the company's sphere of operation. For instance, Lucent Technologies pays attention, firstly, to the number of Nobel laureates who work in the Bell Laboratory and who are the great value of the company. However, they cannot be regarded as an asset in the common meaning of the term [3; 384]. Intellectual capital is included in human capital (HIC), i.e. »the capital realised in humans through their education, qualification, knowledge, experience«. In the field of evaluation and determination of the market value of organizations, workforce potential (WP) is considered to be the most suitable term and is defined as «the set of skills and capabilities of the workforce to provide the effective functioning of the organization» [4; 230].

Different indexes and characteristics have been included in workforce potential, such as »staff number, staff qualification, gender and age, staffing level, personal and professional potential, individual characteristics of the staff — physical and psychological conditions, etc. It is also stated that the age of staff is connected with the perspectives of professional growth of the personnel and the possibility of quick adaptation to new functions, tasks and methods of work.

In [6; 37] the following definition of human resources is suggested as a part of labour and entrepreneurship, where labour is «the full definition which is used by economists to define all the physical and intellectual capabilities of people, which are applied in the production of goods and services».

The categories and regulations accepted at the international conferences of labour statistics and the recommendations of the ILO (International Labour Organization) are used in statistics and surveys of the Federal Service of State Statistics of Russian Federation.

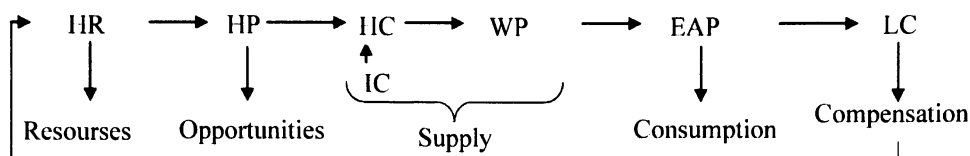
The economically active population (workforce) is the part of the population which provides the supply of work for the production of goods and services. The number of the economically active population includes the employed and the unemployed, a figure that changes in relation to the surveyed period.

The level of economic activity of the population is defined as the proportion of economically active population in comparison with the total population [7; 241].

Simple accumulation of the information flow causes confusion, identification and duplication of economic definitions. As a result, the usage of categories, terms and notions of labour without commonly-accepted definitions or classifications of labour relations does not allow to form an idea of their value or to evaluate the subject of «the measurements».

Figure 1 presents the cause-and-effect relation of the discussed terms and definitions and a number of assumptions (1):

- HR are equivalent to LR;
- WP are equivalent to PP; (1)
- EAP is equivalent to LP.



HR — human resources; LR — labour resources; HP — human potential; HC — human capital; IC — intellectual capital; WP — workforce potential; PP — performance potential; EAP — economically active population; WF — work force; LC — labour cost.

Fig.1. Cause-and-effect relation between the labour categories

Let us analyse the actual state of development of the human resources of Krasnoyarsk Krai based on the presented cause-and-effect relation and a number of assumptions. It is clear that the development of a human being is a constant process of increasing capabilities to achieve a certain level and wealth. Open and free access to resources provides this development and allows people to maintain their level of well-being, to acquire skills and knowledge, to lead a healthy and long life. Consequently, the basis of evaluation of human development includes the volume of consumption of material values as well as the condition of the healthcare system and the education system.

The adequate index to measure the implementation of human goals and development is the integral index of the development of human potential (IIDHP). This index was elaborated in 1990 by the group of economists headed by Makhbubul-Khak. The conceptual structure of the index was created on the basis of Amartiya Sena's work. The same year, the IIDHP was suggested in the Development Programme of UN and has since been published yearly in the Report on the Development of Human Potential. The most important paradigms of human potential are productivity, as the result of effective performance aimed to raise the profit and growth of the economy; equality, as in equal possibilities to realize one's capabilities and the usage of material values; stability, which provides access to the advances of civilization not only for the present generations but also for the future generations; the process of broadening possibilities suggesting development performed in humans' interests and by their forces.

The following indexes are used to calculate the IIDHP: expected lifetime, education level, actual GDP per capita. Taken together they present three main qualities of life — health, education and knowledge, level of well-being.

Thus, the improvement of a population's health is considered to be the main factor in physical development and raising of working capacity and, consequently, in broadening the possibilities for creating goods and services, as well as knowledge accumulation. So, the choice of expected lifetime index is deliberate as it presents the achievements in the field of healthcare.

A rise in educational level has an essential effect on the quality of human capital which is the main factor in multiplying the wealth of the nation and which stipulates the growth of social labour efficiency. The level of education characterizes the

acquired educational, labour, scientific, intellectual and creativity potential, thus making the fund of knowledge and skills — «the spiritual wealth» of the nation that is passed from one generation to another. It is a significant presupposition for human development and the production efficiency in general.

Moreover, based on the quantity of years of study and the expenditure on education of a family, a state, enterprises and organizations, it is possible to determine the accumulated potential of skills by a certain period of time. The process of conversion of the received data from national currency to U.S. dollars allows to make international comparisons and to evaluate the potential dimension according to groups of countries and the world as a whole, identifying common factors and dynamics within the processes.

The welfare or income of the population is defined not by the range of national wealth but by the GDP per capita. Although the indexes of national wealth characterize the accumulated results of the economic activity on a certain date, they are calculated in a limited number of countries and cannot be compared through methods of calculation. Therefore, at the present moment it is accepted to use GDP indexes, which characterize only current performance.

Referring to the mechanism of calculation of the IIDHP, we shall mention its relative simplicity as it is defined as an arithmetic average of three indexes: the index of longevity, which reflects the lifetime from birth that is set in minimum and maximum values in the interval from 25 to 85 years; the index of education, which is derived in 2/3 from the literacy of the adult population (from 0% to 100%) and 1/3 from the total academic enrolment (from 0% to 100%) of the population under 24; the income index, which is measured by GDP per capita from 100 to 40,000 USD, according to the purchasing power balance (PPB) of the national currency.

According to the methodology of the Development Programme of the United Nations, selected standards of minimum and maximum values are used for calculating the components of the summary index, which are compared with the actual measurements using the formula (2):

$$J_{xi} = \frac{\text{factual value}_{xi} - \text{minimal value}_{xi}}{\text{maximum value}_{xi} - \text{minimal value}_{xi}} \quad (2)$$

Thus, the principle of calculation of the components of the summary index is to evaluate the relative difference between the actual rate and the minimum rate, which is the goal of the development. The average rate of the index may take rates in the interval from 0 to 1: closer to 1, the higher the development of human potential and the shorter the path of the country / region to socially important targets. Countries / regions whose IIDHP is more than 0,800 belong to the group of high-level development. If the IIDHP is from 0,500 to 0,799, countries / regions belong to the group of average development. The countries with an IIDHP of less than 0,500 belong to the group of low-level development. The components of the summary index are regarded as the most significant characteristics of the level and quality of the life of the population, which reflect the main processes in the economic and social life of a country / region.

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Conceptually, the principles of the calculation are directed towards adequate, reliable and simple calculation formula which allow to differentiate countries / regions by their level of development.

May these principles be applied in Russia for the subjects of Russian Federation, considering their regional peculiarities? Comparison analysis gives a positive reply. One of the ways to use this principle is to investigate the stable development of the regions that is suggested for use in the Tyumen region and Autonomous Districts.

We shall notice also that the Regional Office of the Federal State Statistics Service of Krasnoyarsk Krai does not perform these calculations. Due to the insufficient amount of statistical data at the present moment, we will use the available official data.

The formula for calculation is in Figure (3).

$$IIDHP = \frac{I_{income} + I_{education} + I_e}{3} \quad (3)$$

*IIDHP* — integral index of the development of human potential; *I<sub>income</sub>* — component income index; *I<sub>education</sub>* — component index of education; *I<sub>e</sub>* — component index of longevity.

The dynamics of changes in the index of income of the population of Krasnoyarsk Krai for the period from 2003 to 2009 is presented in Table 1.

*Table 1*

**Index of income of the population of Krasnoyarsk Krai**

Index	Years							
	2003	2004	2005	2006	2007	2008	2009	2010
1	2	3	4	5	6	7	8	9
GDP per capita, USD*	2906,8	4229,3	5435,0	7019,2	9640,8	10402,4	8806,4	12303,1
Increase / decline rate of GDP per capita, % **	100	145,5	128,5	129,1	137,3	107,9	84,7	139,7
Increment / decline rate, %	0	45,5	- 17,0	0,6	8,2	- 29,4	- 23,2	55,0
Index of income	0,56	0,62	0,67	0,71	0,76	0,78	0,75	0,80
Increase / decline rate I <sub>income</sub> , %	100	111,1	106,7	106,4	107,5	101,7	96,4	107,5
Increment / decline rate I <sub>income</sub> , %	0	11,1	- 4,4	- 0,3	1,1	- 5,8	- 5,3	11,1

\*U.S. dollar exchange rate (on January 1 of each year)

\*\*chain indexes

The minimum GDP per capita in Krasnoyarsk Krai in 2003 was 2906,3 USD, the maximum GDP was 12303,1 USD achieved in 2012. The increment of GDP per capita in 2008 compared with 2007 was 761,6 USD, due to the fulfilment of the Federal Constitutional Law of 14.10.2005 #6-FZK «On the formation of a new subject of Russian Federation as a result of uniting Krasnoyarsk Krai, Taimyr (Dolgan-Nenetz) and Evenk Autonomous Districts». The uniting of these three subjects of the Russian Federation into one in 2007 has had a positive institutional effect even with the lower US dollar exchange rate in 2008 (24,54 USD). The average rate of this period was 7592,9 USD.

The dynamics of the change of GDP per capita was not stable. It is possible to emphasize two intervals: the first, 2004–2006, had a negative decreasing tendency, the index decreased by 16,4% from 145,5% to 129,1%; the second was characterized by even greater decrease of 55,0% (139,7% - 84,7%). Regarding the positive and negative changes, it is possible to define the average value of annual increase as 5,7%.

Table 2

**Index of education of the population of Krasnoyarsk Krai (Ieducation)  
2003-2009**

Indexes	Years						
	2003	2004	2005	2006	2007	2008	2009
1	2	3	4	5	6	7	8
Ilit — actual level of population literacy	0,29	0,35	0,37	0,36	0,36	0,38	0,37
Ien — actual number of enrolments in educational institutions	0,65	0,65	0,64	0,63	0,62	0,62	0,61
Index of education (Ieducation)	0,521	0,561	0,564	0,557	0,551	0,559	0,554
Increase / decline rate of index of education, %*	100	107,5	100,6	98,7	98,9	101,5	99,2
Increment / decline rate, %	0	7,5	-6,9	-1,9	0,2	2,6	-2,3

\*chain indexes

The level of the population's literacy was on average 0,35; the maximum value was 0,38 achieved in 2000; the minimum value was 0,29 in 2003. The average value of the index of the actual number of enrolments in educational institutions was 0,63. The fluctuation were of 0,04 index points (i.p.) with a maximum value of 0,65 in 2003 and 2004 and a minimum value of 0,61 in 2009. The index of education of the population in Krasnoyarsk Krai had an unstable negative tendency of change in the period 2004-2009.

Table 3

## Index of longevity of the population of Krasnoyarsk Krai

Indexes	Years						
	2003	2004	2005	2006	2007	2008	2009
1	2	3	4	5	6	7	8
Expected lifetime ( $e_0$ ), years	62,7	63,6	63,1	65,6	66,6	66,9	67,6
Increase / decline rate of the expected lifetime, %*	100	101,4	99,2	104,0	101,5	100,5	101,0
Index of longevity ( $I_e$ )	0,63	0,64	0,64	0,68	0,69	0,70	0,71
Increase / decline rate of the index of longevity, %	100	102,4	98,7	106,6	102,5	100,7	101,7
Increment / decline rate, %	0	2,4	-3,7	7,9	-4,1	-1,8	1

\*chain indexes

The expected lifetime of the population of Krasnoyarsk Krai has increased by 4,9 years, in general (62,7-67,6). The dynamics of life expectancy showed a decreasing tendency (by 0,4 i.p.) at the end of the investigated period. The dynamics of the index of longevity fluctuated in an interval from 102,4% in 2004 to 106,6% in 2006 and from 102,5% in 2007 to 101,7% in 2009.

Table 4

## Index of development of the human potential of Krasnoyarsk Krai

Index	Years						
	2003	2004	2005	2006	2007	2008	2009
1	2	3	4	5	6	7	8
IIDHP	0,57	0,61	0,62	0,65	0,67	0,68	0,67
Increase / decline rate of IIDHP, %*	100	106,8	102,0	104,1	103,3	101,3	99,0
Increment / decline rate, %	0	6,8	-4,8	2,1	-0,8	-2	-2,3

\* chain indexes

Fluctuation of the changes of the index of development of the human potential of Krasnoyarsk Krai in the investigated period was equal to 0,11 i.p. (0,68-0,57). An upward tendency was unidirectional and stable till 2008.

The IIDHP of Krasnoyarsk Krai in 2012 will make 0,73 according to our calculations. We shall define the year Krasnoyarsk Krai should achieve IIDHP equal

to 1. The average increment of IIDHP in the analysed period was 2,9%. The results of the calculations are presented in Table 5.

Table 5

Forecast of the IIDHP of Krasnoyarsk Krai

Index	Years						
	2012	2013	2014	2015	2016	2017	2018
1	2	3	4	5	6	7	8
IIDHP	0,73	0,75	0,76	0,78	0,80	0,82	0,84
Increase rate, %	107,2	110,0	112,7	115,5	118,2	121,0	123,7

Table 5 continue

Index	Years							
	2019	2020	2021	2022	2023	2024	2025	2026
1	2	3	4	5	6	7	8	9
IIDHP	0,86	0,88	0,89	0,91	0,93	0,95	0,97	0,99
Increase rate, %	126,5	129,2	132,0	134,7	137,5	140,2	143,0	145,7

As is seen in Table 5, in 2026 the value of IIDHP of Krasnoyarsk Krai will approach the estimated value with an annual increase of 2,9% and an increase rate of 148,5%, all other things being equal.

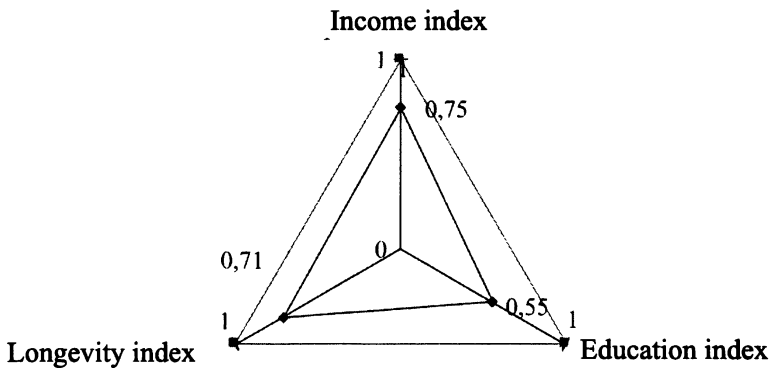


Fig. 2 Value of the IIDHP of Krasnoyarsk Krai in 2009

As can be seen in Fig. 2, as of 2009, the amount of forthcoming work to make the components of the index of IIDHP equal to 1, is determined as  $I_{income}=(1 - 0,75)=0,25$ ;  $I_{education}=(1 - 0,55)=0,45$ ;  $I_e=(1 - 0,71)=0,29$ . In relation to the integral index of the development of human potential  $(1 - 0,67)=0,33$ .

«The weak element» of the structure of the component indexes is the index of education. This situation may be explained by the following circumstances: the



financing of the educational system by the Krai budget and the Federal budget in the period until 2008 was insufficient. Only starting from 2008 did the amount of financing by agency and Krai budget funds, increase. In 2008 were given 29,132.3 billion roubles from agency funds, and 16,275.5 billion roubles from the Krai budget; in 2009, 30,682.1 and 16,956.3 billion roubles, respectively. In 2010, 33,102.1 billion roubles through the funds of the agency and 18,532.4 billion roubles through the Krai budget. Such active financing of the educational system by the agency in 2009 was initiated by a structural shift, namely by the formation of the Siberian Federal University on the basis of the joining of the four universities of Krasnoyarsk.

Among the regions of the Siberian Federal District, Krasnoyarsk Krai takes fourth place in terms of IIDHP value, behind the Novosibirsk, Tomsk and Omsk regions. Based on the index values, the Krai is assigned to the regions of average level of development.

The comparative analysis of the results of evaluation of the development of the human potential of Krasnoyarsk Krai allows to suggest the presence of unoccupied and unused potential in the economic development of the region. The value, equal to 0,33 (1-0,67), indicates a high differentiation in the level of human potential development of Krasnoyarsk Krai.

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