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Indicator Analysis of the Human Potential of the Russian Federation in the System of Quality and Standard of Living-The Anthropogenic Load on the Social and Natural Environment

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Abstract: The modern phase of development is characterized by a significant anthropogenic impact on the ecological and economic system. The extent of this process suggest the need to develop a new way of management based on the principles of resource saving and balanced environmental-economic functioning of the economy. Neglecting environmental factors would have an adverse effect on the opportunity of human development, on the prospect of the full satisfaction of social need in quality historical predeterminancy. Human potential is an existing resource of a particular society, giving him the opportunity to not only save itself but also to develop as a subject of modern human civilization. The study analyzes the dynamics of the human development index with a particular attention paid to the place of Russia in this rating. It was found that the indicator growth rate does not allow us to speak about substantial improvement in the quality of life, standards of living and improved human development. At the same time, there is a situation when the period of sharp decline in the human development index coincides with a period of increased anthropogenic impact and vice versa. All this reflects the existence of a bilateral relationship, "the quality of life and standard of living the anthropogenic impact on the social and natural environment" when growth of economic activity leads to the appearance of the factors adversely affecting the quality of life and standards of living. The linkage between life quality/sstandards of living and the anthropogenic impact on the social and natural environment is evaluated in terms of the existence of correlation between the change in the indicators characterizing the life quality and standards of living and indicators of anthropogenic impact on the social and natural environment, based on the statistics on economic and ecological systems of Russian regions. The study that have been undertaken allowed us to establish extensiveness of this relationship. The situation implies the existence of the negative elements affecting economic growth, on the one hand and ensuring the improvement of quality and standards of living and on the other hand, reducing its volume, reducing human ressources.

Key words: Quality, standards, economic, ecological, volume

INTRODUCTION

The accumulation of human capital is one of the main "locomotive" of economic g rowth, a key factor for the well-being of modern societies. The 20th century has been called the century of economists, human capital (Goldin and Katz, 2009) even with a big right, this characteristic applies to the 21st century. The last statement is due to the variety of "benefits" process of investment in human capital. In general, the assessment made at different times, on the basis of different statistical information, the individual countries-developed, developing, post-socialist-clearly supports the fact that the economic returns from human capital exceeds the return on capital of the material.

However, it should be noted that the concept of "human capital" does not give a holistic view of man as a productive force and by the agent on the one hand and self-sufficient socio-biological individual, capable of self-development in a changing environment-on the other, led to the emergence the concept of sustainable development and the key to it the concept of "human

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potential". To a greater extent with this task, at least within the limits of ecological and economic systems actually work, using the concept of "human potential".

MATERIALS AND METHODS

The genesis of the concept of "Human Potential": Human potential is an existing resource in a particular society, giving him the opportunity to not only save himself but also self-development as a subject of modern human civilization.

Human potential enables society, social group and each single individual to adapt successfully to changing environmental and social conditions, improve their spiritual and moral, scientific, cultural and socio-economic level, to ensure sustainable development. Thus, the human potential of society is determined by:

- The level of education and professional qualification of its members
- The state of public and personal health
- Demographic perspective of spiritual and moral mood of the population (Sen, 1996)

Human capital and human potential are the main preconditions for the formation of the social capital of the company which is expressed in spiritual and material goods, social, legal and political systems. Therefore, it largely determines the possibilities and conditions for the existence and development of social systems as a member of the world community, their contribution to the culture of humanity as well as the ability to maintain itself and reproduce itself, guarantee human rights and the conditions for the full development of personality. Social capital is a complex phenomenon, consists of a number of fundamental elements:

- The organization of the education system and the educational level of the society
- Health status and health care organization as a social institution (the quality of public health has a direct impact on the economic well-being of society, so "investment in health" provide the quickest and most tangible economic benefits)
- Information security
- Demographic situation
- Prestige in the international arena in the field of economy, science and technology and military strategic potential
- Economic situation
- The socio-political structure of society (Shingarov, 2012)

In modern conditions for the development of socio-economic relations between Russia needs a "bias in favor of human capital" is therefore sufficient interest becomes a question of the last reserves of determining in particular the ability of reproduction of the labor force (Pakhomova *et al*., 2014). the accumulated regions of Russian Federation. At the same time, this issue should be studied not in a static section and in the dynamics of the factor of development. This assessment will form an idea as to regional differentiation as well as about the nature of the internal mechanisms of economic growth. It should reveal the role of the various assets in the formation of national wealth, to determine the ratio of the rate of accumulation of human and physical capital, set the volume of investment in human factors determining them.

Human potential has many dimensions and can be purchased in different ways. The main types of investment in human potential are: education; production training; health protection; migration; search for information on the labor market; the birth and upbringing of children.

For Russia in the process of modernization aimed at improving the competitiveness of high-tech and manufacturing industries, development of human resources is a necessary condition (Tatuev *et al*., 2015; Tikhomirov *et al*., 2016; Abramov *et al*., 2012; Rossinskaya and Bugaeva, 2010, 2011; Vasenev 2012). However, it is important to understand that investing in human capital, must be combined with measures for its conservation. Therefore, relevant research, dedicated to the analysis of the factors (environmental, political, social, gender, religious and others). Influencing change individual elements of human potential.

The human potential of the country, region or a separate territorial entity can be estimated on the basis of the set, both natural and cost parameters but generalizing indicator is the average Human Development Index which is calculated according to three indicators characterizing the life expectancy, educational attainment and real per capita gross domestic product (gross regional product).

Human Development Index-a composite indicator of the human development in the countries and regions of the world. Its values are calculated annually by experts of the Programme of the United Nations Development Programme (herein after the UND) together with a group of independent international experts who use in their work, along with the analytical development, statistics, national institutions and international organizations.

Human Development Index, a comprehensive indicator of the level of human development in a country, so it is sometimes used as a synonym for such concepts as "quality of life" or "standard of living".

The Human Development Index measures a country's achievements in terms of health, education and actual income of its citizens. In addition, when determining the

Table 1: Dynamics of human development index Russia for 2009-2015 year (Human Development Index, 2016)

Index	2009	2010	2011	2013	2014	2015
Human development index of the Russian federation building	0.817	0.719	0.755	0.788	0.778	0.798
Position of the russian federation on the value of the human development index	71.000	65.000	66.000	55.000	57.000	50.000
The average index of human development group of countries with low human development index	0.427	0.375	0.423	0.546	0.455	0.468
The average index of human development group of countries with medium human development index	0.674	0.598	0.643	0.721	0.638	0.632
The average index of human development group of countries with high human development index	0.840	0.727	0.741	0.826	0.745	0.751
The average index of human development group of countries with very high human development index	0.943	0.854	0.865	0.920	0.867	0.875

rating takes into account many factors: the situation of human rights and civil liberties, the opportunity to participate in public life, social protection, the degree of territorial and social mobility of the population, indicators of the level of cultural development, access to information, health, unemployment, state crime, the environment and others. The final ranking of all states are ranked based on the Human Development Index and are classified by four categories:

- Countries with very high human development index
- Countries with high human development index
- The country with an average level of human development index
- Countries with low human development index

Currently, the Human Development Index covers 190 countries-participants UND. However, due to the lack of reliable statistical rating table often has a smaller number of states. The countries that are unwilling or unable to provide statistics on the components of the human development index, are not included in the rating and dealt with separately. Reports UND data on human development is usually delayed for two years, since they require an international comparison, after the publication of data by national statistical offices (Human Development Index, 2016).

Russia in 2015 occupied the 50th place and was part of the second group of countries with "high human development index value" which was 0.798. The value of the index of the Russian Federation of human potential by 17.5% lower than that of the country's leader on this indicator-Norway and 2.3 times higher than that of the most lagging-Niger. In general, Russia is in a number of countries on the human development shall drop as Latvia, Croatia, Kuwait, Montenegro, Belarus, Oman, Romania, Uruguay and the Bahamas. The dynamics of the index values of the Russian Federation of human potential (the index of the human potential of the Russian Federation) is presented in Table 1.

In general, for the 2009-2015 biennium quality and standard of living in the Russian Federation in the

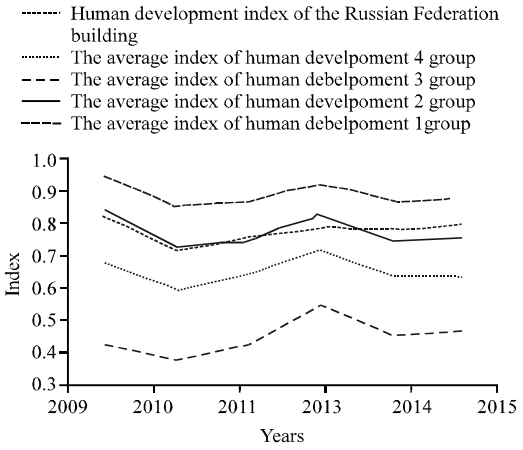

Fig. 1: The dynamics of the index value of human development

cross-country comparison increased, this indicates a change of place in the ranking of the human development index values from 71 in 2009-50 in 2015. However, with the value of the test of the index during this period decreased by 1.9%. This contradiction is explained by the sharp drop in the values of the human development index in 2010 by 9.8% compared with 2009. If we exclude the possibility of changing the methodology for determining the index of human development, it can be stated that in Russia during the period of 2010-2015 was the recovery time and the quality of living standards, achieved in 2009. This situation is typical for all groups of countries (Fig. 1).

Falling value of the average index of human development at 4 group "with low human development index" was 5.2%, 3 group "with an average level of human development index" -7.6%, 2 group "with high index levels human development" -11.3% and1band "with a very high human development index"-8.9%. The absence of the multiplicity of values leads to the assumption that changes in method of calculating this indicator did not occur. Consequently, in 2010, there was a decline in the quality and standard of living. Follow his recovery during

Table 2: Comparative dynamics of the integral development of the index values of the human potential of Russia and the results of anthropogenic load on the social and natural environment

	Significance							
Period	Human development index	Emissions of pollutants into the atmosphere (mln.tons)	Capture of air pollutants (ths.tons)	The use of fresh water (mln. M^3	The volume of recycled and successively used water (mln.M^3)	Discharge of polluted wastewater into surface water bodies (bln. M^3)	Formed production and consumption waste (mln.tons)	The use and disposal of production and consumption waste, (mln.tons)
2009	0.817	36.1	26.6	64.7	138.2	15.9	3505.0	1661.4
2010	0.719	32.4	24.5	69.7	140.7	16.5	3734.7	1738.1
2015	0.798	31.2	23.6	63.2	136.6	14.8	5168.3	2357.2

the 2011-2015 biennium. It was uneven. The average annual growth rate of the human development index values in Russia amounted to 2.6% and in 1-4 group of countries-0.6, 0.8, 1.4 and 5.7%, respectively.

Thus, the growth rate does not suggest a significant improvement in living standards and the quality of the human development index values of the population and, consequently, the prospects for human development. For Russia, the situation is complicated because of the high heterogeneity of its regional development. Features of formation and human development differ greatly depending on the particular ecological and economic system of the Russian Federation. As part of this system is functioning two-way communication, "the quality and standard of living-the anthropogenic load on the social and natural environment" when the growth of economic activity, raising the value of the index of human development, can lead to the appearance and manifestation of the factors adversely affecting the quality and standard of living (Table 2).

In this regard, the speaker provided in Table 2 illustrates the following situation. During the period of sharp decline in the value of the index of human capital development which is treated as a reduction in the quality and standard of living of the population of Russia, there was an increase of anthropogenic impact. This is evidenced by the following facts:

- The use of fresh water increased by 7.7%
- Discharge of polluted wastewater into surface water increased by 3.8%
- The volume of the resulting waste production and consumption increased by 6.6%

The exception was only the dynamics of pollutant emissions into the air volume. They decreased by 10.2%. In the period 2010-2015, when the value of the human development index recovered to the level of 2009, marked by a downward trend changes in indicators of anthropogenic load on the social and natural environment in Russia:

- The use of fresh water was optimized by 9.3%
- Discharge of polluted wastewater into surface water bodies decreased by 10.3%

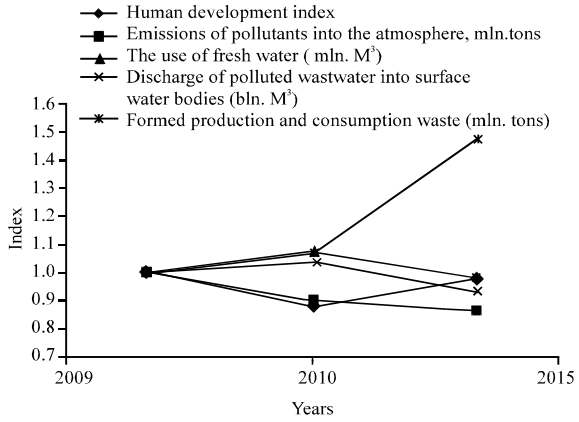

Fig. 2: Dynamics of values of the index of human development and indicators of human impact on the social and natural environment

- Emissions of pollutants into the air decreased by 3.7%

However, the rate of waste production and consumption increased to 7.68% per year (Fig. 2). Consequently, the whole of Russia in 2010-2015 is characterized by a situation where the quality of the restoration and the standard of living was accompanied by a decrease of anthropogenic load from 0.7-2% per year. That is probably due to the tightening of legislation in the field of valuation of pollutant emissions into the environment. The situation in 2009-2010 with a certain degree of confidence can be attributed to time lags between manifested in 2010, a period of post-crisis recovery of the economy, caused by the growth of anthropogenic load and obviously slower recovery quality and standard of living, due to the distribution system and the shortcomings redistribution of wealth and resources.

Overall macroeconomic level studies confirmed the existence of two-way communication, "the quality and standard of living-the anthropogenic load on the social and natural environment". It is on the scale of Russia revealed a typical, when the production of surplus product is due to the intensification of the use of natural capital, in percentage terms more significant than the

result, the quality of the hanging and standard of living. This public environmental activity slows the extensification of farming.

The calculation of integral indicators of human development index: Identify links "quality and standard of living-the anthropogenic load on the social and natural environment" should be evaluated in terms of the existence of correlation between the change in values of parameters that characterize the quality and standard of living and indicators of anthropogenic load on the social and natural environment. The first group of figures represented an integral indicator of the human development index, calculated from 80 Russian regions and private indicators: life expectancy at birth, gross regional product per capita (Table 3). The second group

Table 3: Dynamics of index of index values of human potential in the Russian regions

The subject of the Russian Federation	Human development index			Life expectancy (years)			The gross regional product per capita (thous. rub.)		
	2009	2010	2015	2009	2010	2015	2009	2010	2015
1 2	3	4	5	6	7	8	9	10	
Belgorod region	0.581	0.608	0.573	71.10	71.30	72.70	199.0	227.7	275.0
Bryansk region	0.480	0.487	0.474	67.90	67.90	69.90	98.0	100.5	134.8
Vladimir region	0.465	0.486	0.476	66.20	67.10	69.70	127.8	136.2	159.7
Voronezh region	0.515	0.531	0.529	68.90	69.50	71.30	129.1	130.0	208.9
Ivanovo region	0.461	0.470	0.471	66.70	67.10	70.30	81.3	90.4	99.7
Kaluga region	0.495	0.515	0.509	67.60	68.10	70.40	152.6	163.2	221.4
Kostroma region	0.477	0.490	0.492	67.20	67.50	70.50	116.9	128.3	153.2
Kursk region	0.504	0.520	0.521	68.10	68.50	70.60	141.8	150.0	182.6
Lipetsk region	0.529	0.535	0.527	68.40	68.60	71.10	192.2	185.3	234.4
Moscow region	0.531	0.560	0.529	68.20	69.10	71.40	217.3	227.2	258.6
Oryol region	0.509	0.508	0.501	68.70	68.40	70.30	113.8	117.8	160.7
Ryazan region	0.492	0.500	0.518	67.70	67.80	71.30	131.9	135.6	179.3
Smolensk region	0.450	0.475	0.489	65.60	66.60	69.90	125.7	137.1	166.7
Tambov region	0.505	0.517	0.517	68.80	69.20	71.60	123.5	115.1	177.7
Tver region	0.453	0.463	0.462	65.30	65.90	68.90	144.3	141.2	159.8
Tula region	0.476	0.484	0.489	66.70	67.10	70.10	136.9	133.6	184.8
Yaroslavl region	0.522	0.523	0.525	68.60	68.40	71.10	165.8	164.5	209.5
Moscow	0.712	0.790	0.822	73.60	74.20	77.20	628.9	639.9	723.5
The Republic of Karelia	0.486	0.484	0.499	66.60	66.40	69.80	162.6	163.4	201.2
Komi republic	0.551	0.565	0.553	66.50	66.90	69.50	330.0	342.2	380.2
Arhangelsk region	0.541	0.553	0.548	67.60	67.90	70.70	260.6	265.2	312.2
Vologda region	0.502	0.507	0.508	67.30	67.10	70.20	176.2	190.7	223.6
Kaliningrad region	0.511	0.537	0.512	67.70	68.80	70.70	180.8	182.3	217.6
Leningrad region	0.510	0.544	0.506	66.70	68.10	70.70	252.9	250.8	276.9
Murmansk region	0.531	0.560	0.531	67.20	68.40	70.40	252.0	256.5	286.0
Novgorod region	0.461	0.463	0.483	64.50	65.00	68.90	183.2	175.3	227.8
Pskov region	0.429	0.427	0.446	64.50	64.60	68.50	108.8	112.7	127.3
Saint Petersburg	0.647	0.665	0.659	71.20	72.10	75.10	306.5	305.8	352.7
Republic of Adygea	0.519	0.526	0.513	70.00	70.00	72.50	94.4	94.0	119.4
Republic of Kalmykia	0.486	0.503	0.511	68.60	69.40	72.50	82.6	73.9	112.4
Krasnodar region	0.552	0.574	0.553	70.70	71.00	72.70	165.6	172.4	226.6
Astrakhan region	0.502	0.519	0.517	68.30	69.10	71.20	133.0	125.6	194.7
Volgograd region	0.527	0.539	0.529	69.50	69.70	72.10	144.3	145.4	191.5
Rostov region	0.529	0.540	0.517	69.50	69.70	71.80	129.6	135.0	161.8
The Republic of Dagestan	0.581	0.595	0.566	74.00	73.90	76.30	90.5	83.1	124.1
The Republic of Ingushetia	0.605	0.579	0.612	78.30	74.70	79.90	46.2	42.2	78.1
Kabardino-balkar Republic	0.546	0.560	0.530	72.10	72.10	74.60	76.5	78.5	94.3
Karachay-cherkess Republic	0.535	0.566	0.530	71.50	72.40	74.40	81.8	80.4	101.2
Republic of North Ossetia-Alania	0.5550	0.580	0.547	71.90	72.70	74.30	90.0	92.6	123.6
Chechen republic	0.470	0.494	0.502	73.20	71.60	73.50	52.0	49.0	71.4
Stavropol region	0.522	0.548	0.527	70.30	71.00	73.20	100.0	104.1	132.8
Republic of Bashkortostan	0.530	0.534	0.505	69.00	68.90	70.20	159.4	163.3	210.6
Mari El Republic	0.472	0.479	0.475	67.10	67.30	69.90	98.9	103.4	143.8
The Republic of Mordovia	0.509	0.519	0.513	69.10	69.30	71.80	107.9	110.3	144.7
Republic of Tatarstan	0.591	0.592	0.580	70.80	70.40	72.60	234.2	231.7	298.3
Udmurt Republic	0.512	0.516	0.512	68.30	68.10	70.50	151.3	157.9	199.9
Chuvash Republic	0.510	0.506	0.500	69.00	68.50	71.10	111.3	110.2	130.2
Perm region	0.502	0.504	0.508	66.6	66.6	69.5	203.4	206.6	252.0
Kirov region	0.485	0.497	0.501	67.9	68.2	71	107.7	112.1	131.4
Nizhny Novgorod region	0.494	0.499	0.503	67.1	67	70	164.1	172.3	213.4
Orenburg region	0.526	0.529	0.501	67.9	68	69.2	202.3	197.0	250.4
Penza region	0.51	0.517	0.517	69.4	69.3	72.1	105.5	108.6	150.5
Samara region	0.525	0.53	0.516	68.2	68.1	70.1	181.3	189.3	246.2
Saratov region	0.52	0.521	0.511	69.1	68.9	71.4	128.5	130.3	154.7

Table 3: Continue

The subject of the Russian Federation	Human development index			Life expectancy (years)			The gross regional product per capita (thous. rub.)		
	2009	2010	2015	2009	2010	2015	2009	2010	2015
1 2	3	4	5	6	7	8	9	10	
Ulyanovsk region	0.503	0.507	0.496	68.8	68.5	70.8	118.2	120.4	151.4
Kurgan region	0.477	0.485	0.468	67.4	67.7	69.2	117.1	113.0	132.8
Sverdlovsk region	0.529	0.552	0.526	68.4	68.8	70.2	191.4	213.0	263.7
Tyumen region	0.813	0.825	0.791	69.5	69.5	72	852.9	852.3	997.4
Chelyabinsk region	0.516	0.525	0.503	68.3	68.4	70.2	159.9	164.3	195.1
Altai Republic	0.449	0.442	0.445	65.8	65.7	68.2	97.1	95.2	126.3
The Republic of Buryatia	0.448	0.459	0.461	65.3	66.1	69	125.2	120.5	130.0
Tyva Republic	0.346	0.336	0.323	60	60.5	62.2	87.9	87.6	102.5
The Republic of Khakassia	0.492	0.494	0.485	67.3	67.1	69.3	152.2	157.9	205.9
Altai region	0.494	0.498	0.482	68.5	68.4	70.5	109.1	109.4	128.8
Transbaikal region	0.435	0.436	0.436	64.7	64.8	67.8	134.0	131.8	143.5
Krasnoyarsk region	0.544	0.573	0.537	67.6	67.6	69.7	264.5	326.5	342.1
Irkutsk region	0.478	0.475	0.471	65.5	65.3	67.3	187.7	196.5	257.7
Kemerovo region	0.474	0.478	0.458	65.4	65.4	68.2	184.7	198.1	188.0
Novosibirsk region	0.533	0.542	0.526	68.9	69.3	70.7	160.2	159.1	224.4
Omsk region	0.526	0.533	0.519	68.7	68.8	70.6	169.3	169.2	208.0
Tomsk region	0.554	0.568	0.551	68.1	68.8	71.1	237.3	238.7	274.0
The Republic of Sakha(yakutia)	0.556	0.568	0.594	66.5	66.8	70.3	342.5	353.5	474.1
Kamchatka Krai	0.527	0.519	0.511	66.1	65.8	68.5	292.0	280.1	313.3
Primorsky Krai	0.502	0.509	0.492	66.7	66.6	69.2	187.6	210.4	228.2
Khabarovsk region	0.507	0.501	0.499	66.3	65.7	68.5	205.1	230.0	281.6
Amur region	0.452	0.452	0.451	64.4	64.4	67.4	180.6	188.1	199.3
Magadan region	0.489	0.522	0.551	64.1	65.1	67.6	299.4	330.9	446.4
Sakhalin region	0.699	0.735	0.755	64.8	64.9	68.3	779.9	855.7	1112.2
Jewish autonomous region	0.423	0.427	0.403	63.3	63.7	65.6	142.4	156.2	169.2
Chukotka Autonomous Okrug	0.612	0.509	0.535	58.2	57.5	62.7	872.4	672.4	768.0

of indicators characterizing the extent of human influence on regional social and natural environment, represented by the following indicators: amount of waste production and consumption; the amount of waste used production and consumption; the number of neutralized waste production and consumption; fee permissible and excessive emissions (discharges) of pollutants (waste disposal and consumption). The dynamics of these parameters values are presented in Table 4. In addition, estimated indicators: emissions of pollutants into air and water, the volume of fresh water use. The values of these parameters obtained from public sources of the Federal State Statistics Service (Region of Russia, 2010, 2013). The values of some parameters obtained by adjustment for 2015.

Gross regional product per capita defined in constant 2009 prices on the basis of the use of the correction factor, specific to the indices deflators of gross domestic product; Gross regional product per capita in the Russian Federation regions, calculated approximately on the basis of the correction coefficient of the dynamics of the physical volume of the gross domestic product of Russia. The value of the average index of human development for the regions of Russia was calculated on the maximum and minimum values of its partial indicators characteristic specific period of development of the regional economy of the Russian Federation.

RESULTS AND DISCUSSION

In the course of calculation correlation with df of 80, two-way communication, "the quality and standard of living-the anthropogenic load on the social and natural environment" in the context of the Russian Federation were able to establish the existence of a significant relationship between the values of the human development index and pay-per-permissible and excessive emissions, volumes of pollutant emissions into the air, wastewater discharge into surface water bodies. In addition, an association between the value of gross regional product per capita and pay-per-permissible and excessive emissions and volumes of pollutant emissions into the atmosphere.

The significant relationship between the values of the index of human development and volumes of fresh water use; life expectancy and the volumes of fresh water use and wastewater discharge into surface water bodies. The values of the gross regional product per capita are significant relationship with the values of indicators of life expectancy and volumes and discharges of polluted wastewater into surface water bodies (Table 5).

Assessment of the significance of correlation dynamics of the studied parameters values for the years 2009-2015 has revealed the existence of significant association values of the indicators:

Table 4: Dynamics of values of the indicators of production waste, consumption and related indicators

The subject of the russian federation	The amount of waste used by the production and consumption (thous.tons)			The amount of waste generated production and consumption (thous.tons)			Quantity of the neutralized consumption (thous.tons)			Fee for valid and excessive emissions waste production and (discharges) of pollutants (disposal of production and consumption waste) (mln.rub.)		
	2009	2010	2015	2009	2010	2015	2009	2010	2015	2009	2010	2015
1	2	3	4	5	6	7	8	9	10	11	12	13
Belgorod region	22575.7	32657.9	40601.8	71776.3	134538.9	154126.9	1631.2	1114.1	5971.9	164.3	169.7	195.7
Bryansk region	363.9	790.7	1157.2	517.4	916.6	1270.1	11.8	2.5	5.5	42.2	40.7	34.6
Vladimir region	3697.3	3725.3	3609.8	4414.4	4448.2	4321.6	6.3	4.5	24.5	48.0	55.6	51.6
Voronezh region	2473.4	3092.7	4383.3	4613.8	5227.0	6755.8	72.2	76.3	75.3	107.5	115.2	132.5
Ivanovo region	216.5	82.2	75.5	438.4	398.4	260.2	16.6	16.3	27.9	23.2	23.8	27.0
Kaluga region	2662.0	4231.7	3991.5	2776.6	4604.2	4293.8	1.2	2.2	0.1	42.2	53.4	44.7
Kostroma region	629.8	910.4	941.9	772.1	1008.8	1105.6	1.3	33.1	14.4	18.3	16.7	17.3
Kursk region	2028.8	945.8	2218.5	59075.9	52481.2	54366.3	158.6	454.3	716.0	75.4	78.3	79.0
Lipetsk region	6050.7	6424.2	5558.9	6942.8	7352.1	6446.1	99.4	6.4	4.3	154.9	147.7	169.4
Moscow region	1507.5	5961.2	2369.4	3978.1	4789.0	3045.7	30.2	16.1	70.5	669.8	411.6	465.8
Oryol region	575.7	598.1	1203.2	1676.3	1561.7	2383.9	15.0	118.6	203.7	14.5	18.2	19.1
Ryazan region	630.0	1030.6	1139.6	870.5	1659.9	1625.1	0.3	11.4	2.8	250.5	229.9	202.0
Smolensk region	295.4	732.0	460.7	541.5	1083.6	840.0	0.8	0.2	2.2	73.6	70.5	62.6
Tambov region	1626.9	2304.0	2826.8	2625.4	3657.9	4033.4	0.4	0.3	0.1	41.6	46.2	43.4
Tver region	203.2	415.9	4.9	263.9	869.6	7.4	2.9	3.6	0.0	56.7	56.9	51.1
Tula region	1899.9	1705.7	5820.7	2812.7	2691.1	8651.4	170.7	255.9	266.8	194.6	123.9	107.1
Yaroslavl region	1157.8	907.3	781.0	1527.4	1278.8	1191.4	19.4	24.6	36.4	83.1	121.6	115.6
Moscow	1294.9	2103.6	2176.2	4773.0	6259.7	5334.8	867.4	754.0	459.9	680.5	638.5	370.9
The Republic of Karelia	7285.9	6704.8	47719.4	136646.6	135788.3	128826.6	23.3	90.0	75.7	203.5	175.5	219.3
Komi Republic	17531.8	1654.0	1682.5	23983.6	6778.6	8410.9	38.9	56.1	22.8	512.7	931.8	629.8
Arhangelsk region	10501.8	13656.5	6060.3	60947.4	126096.9	81532.0	34.0	28.7	25.2	443.0	341.1	362.4
Vologda region	8167.3	8571.0	10047.0	10534.3	14679.6	14951.0	219.5	405.1	132.7	107.8	137.7	164.8
Kaliningrad region	80.9	148.0	141.8	295.6	1131.6	824.3	0.8	11.7	3.8	53.1	47.1	45.5
Leningrad region	1876.8	3555.3	7967.9	1330.2	3803.2	5705.6	210.3	173.0	194.8	373.4	278.3	172.8
Murmansk region	26066.0	41997.8	41463.3	237151.7	240917.4	186619.5	197.8	105.3	88.7	508.8	668.4	539.8
Novgorod region	564.7	1142.5	1570.7	606.6	1086.1	2199.3	0.0	47.9	181.4	44.7	47.8	44.5
Pskov region	395.6	388.3	635.6	564.6	553.2	580.0	78.0	196.7	65.0	20.7	22.2	24.3
Saint Petersburg	338.3	1861.6	3112.8	4265.2	8039.9	7662.8	387.5	461.8	376.9	948.8	560.0	655.9
Republic of Adygea	0.0	26.2	36.3	5.0	1737.6	2404.7	0.0	0.0	0.0	6.7	9.0	18.4
Republic of Kalmykia	0.1	0.2	0.2	3.6	7.7	10.7	0.0	0.0	0.0	2.9	4.6	4.3
Krasnodar region	3583.8	3732.4	5165.1	9198.4	12656.8	17515.2	2170.2	2044.5	2829.3	274.4	401.1	490.1
Astrakhan region	30.9	325.2	450.0	279.7	307.9	426.0	66.0	135.9	188.1	38.8	38.0	51.6
Volgograd region	1461.0	436.6	604.2	2720.2	2490.2	3446.1	403.3	1751.0	2423.1	130.3	116.1	139.4
Rostov region	1194.6	2160.3	2989.6	4053.7	3208.3	4439.8	303.7	247.2	342.1	296.3	313.1	218.9
The Republic of Dagestan	2.9	7.8	10.8	40.0	39.2	54.3	0.0	0.0	0.0	375.8	219.8	2.7
The Republic of Ingushetia	0.0	0.0	0.0	0.1	4.7	6.5	0.0	0.0	0.0	0.1	0.2	0.1
Kabardino-Balkar Republic	20.7	120.1	166.2	148.3	127.8	176.9	0.0	73.3	101.5	6.3	5.4	4.7
Karachay-Cherkess Republic	812.9	684.8	947.7	1290.5	1154.1	1597.1	4.3	2.8	3.9	112.8	107.6	44.5
Republic of North Ossetia-Alania	103.9	123.0	170.2	218.1	222.2	307.5	13.8	11.0	15.3	9.4	11.9	7.7
Chechen Republic	0.0	0.0	0.0	2.1	1.7	2.3	0.0	0.6	0.8	3.7	4.6	13.3
Stavropol region	464.5	112.2	155.3	1607.0	342.9	474.6	165.2	36.5	50.6	48.2	58.5	95.5
Republic of Bashkortostan	5351.0	6420.5	4466.6	53164.3	42928.0	19923.4	154.5	201.4	194.6	621.9	519.4	454.4
Mari El Republic	414.4	463.4	916.5	514.7	660.8	1018.2	12.1	7.5	0.0	18.4	17.5	17.9
The Republic of Mordovia	1462.8	1103.0	975.1	1540.8	2158.8	1200.8	0.2	0.2	3.4	314.8	184.0	43.7
Republic of Tatarstan	1797.8	2057.2	2314.0	2806.9	3602.1	2952.7	361.4	333.9	141.1	507.2	477.6	582.2
Udmurt Republic	570.1	753.4	560.7	787.3	1243.9	1386.3	123.8	342.1	441.6	461.4	348.1	131.2
Chuvash Republic	123.1	176.1	214.2	399.7	411.7	597.7	31.2	35.0	59.1	78.9	96.0	87.0
Perm region	12373.5	14573.9	15661.1	30702.8	36210.8	40994.8	293.6	326.8	517.8	557.6	325.1	225.9
Kirov region	1389.8	1275.3	1634.2	1961.3	1733.0	1933.8	352.2	252.5	119.7	81.4	92.5	85.1
Nizhny Novgorod region	2555.5	1570.0	1118.0	3276.1	2834.0	3297.2	78.9	89.8	320.7	413.9	446.2	429.9
Orenburg region	6718.2	8894.9	10569.0	60744.1	83738.4	64676.0	54.5	98.6	630.0	1476.3	466.6	363.1
Penza region	339.1	836.2	891.3	1862.7	2762.3	1946.5	1.1	64.3	63.6	40.1	40.0	58.1
Samara region	2357.0	2091.7	1287.7	5117.0	4789.5	3588.5	1339.3	1431.4	797.6	707.1	520.7	607.6
Saratov region	998.7	1344.0	942.8	4657.0	5029.3	4770.5	64.2	80.0	65.9	114.2	727.7	131.3

Table 4: Continue

The subject of the russian federation	The amount of waste used by the production and consumption (thous.tons)			The amount of waste generated production and consumption (thous.tons)			Quantity of the neutralized consumption (thous.tons)			Fee for valid and excessive emissions waste production and (discharges) of pollutants (disposal of production and consumption waste) (mln.rub.)		
	2009	2010	2015	2009	2010	2015	2009	2010	2015	2009	2010	2015
1	2	3	4	5	6	7	8	9	10	11	12	13
Ulyanovsk region	91.5	598.3	130.9	370.9	868.0	844.6	291.3	292.2	246.0	56.4	66.5	72.4
Kurgan region	348.2	470.7	188.2	696.9	707.9	752.2	0.9	1.1	22.5	23.1	39.7	38.4
Sverdlovsk region	53728.4	82705.2	88612.7	139646.0	178957.3	168937.4	168.6	952.9	851.9	1774.4	1114.8	1188.1
Tyumen region	3050.8	683.8	868.2	7378.1	1323.8	1079.3	277.6	11.6	15.5	5256.1	4877.7	2109.2
Chelyabinsk region	86163.3	45023.7	32067.0	108734.9	106146.9	95228.7	180.6	179.3	10.8	388.4	802.6	387.8
Altai Republic	4.6	61.5	30.2	108.6	177.2	52.0	0.0	0.0	0.0	3.3	5.0	5.5
The Republic of Buryatia	1566.8	6098.9	2713.3	29008.4	59065.8	50230.7	18.9	28.9	69.8	76.1	68.4	72.3
Tyva Republic	2.6	0.0	2811.9	6514.6	0.0	7876.8	6485.6	0.0	0.0	12.0	6.6	10.9
The Republic of Khakassia	28949.1	103355.4	183726.2	82315.8	124799.9	220952.2	0.5	0.3	0.4	93.8	66.7	96.0
Altai region	692.9	815.6	1274.4	3366.3	3309.2	3178.4	19.9	7.8	25.0	70.3	67.1	86.7
Transbaikal region	55394.6	65698.1	325191.0	91206.7	119094.6	372537.8	31.4	1.6	77.9	136.3	139.4	92.9
Krasnoyarsk region	366634.9	297612.9	331807.6	430505.8	354823.3	371229.2	4.4	16.9	1.7	4777.4	2016.4	2959.3
Irkutsk region	11539.1	92770.5	155942.8	118121.9	104513.3	119888.6	46.2	21.3	40.5	915.1	706.7	816.1
Kemerovo region	1290264.7	889537.0	1079011.9	2698092.3	2661281.1	2319800.7	100.4	291.0	358.2	823.5	1050.7	964.3
Novosibirsk region	525.7	690.0	2392.9	2003.2	1862.7	3881.2	473.1	61.9	6.0	156.2	142.9	122.2
Omsk region	2971.7	3503.8	809.7	6566.5	5042.4	2894.3	49.4	30.8	31.8	115.4	172.3	189.7
Tomsk region	255.2	314.3	238.1	1363.7	1014.2	907.1	115.2	107.1	138.9	688.6	1274.7	684.5
The Republic of Sakha (Yakutia)	183258.6	148586.2	102931.1	287922.4	269382.2	252710.9	7.1	29.0	54.9	224.3	261.9	283.9
Kamchatka krai	109.5	137.1	51.2	493.8	520.9	572.5	4.2	3.2	2.8	398.0	146.9	144.6
Primorsky krai	2538.9	3891.9	3871.9	9079.6	41136.0	40289.3	141.9	149.4	161.0	193.0	163.9	7720.3
Khabarovsk region	30526.4	65825.9	66723.1	82389.9	85739.9	105673.3	18.8	76.0	51.8	541.8	67.2	72.2
Amur region	80.7	371.7	1816.9	1171.7	3144.3	2309.3	1.7	6.2	9.7	120.3	107.7	143.9
Magadan region	4112.9	6154.1	11800.6	15108.5	11872.7	17167.4	24.4	253.7	0.9	52.8	43.8	58.4
Sakhalin region	37261.1	12222.1	15034.4	39718.4	23432.1	15452.6	40.0	26.8	150.9	76.2	63.7	98.3
Jewish Autonomous region	128.3	65.7	102.0	242.3	179.9	167.8	23.8	4.7	1.7	11.6	8.7	5.5
Chukotka Autonomous okrug	2272.4	281.0	2633.5	11986.4	4878.7	11360.3	0.6	0.4	258.9	102.1	44.1	52.6

Table 5: Results of the correlation estimate of the mean values for the 2009-2015 performance two-way communication. the quality and standard of living the anthropogenic load on the social and natural environment

Index	Human development index	Life expectancy	The gross regional product per capita
The amount of waste used by the production and consumption	-0.0739	-0.14710	0.0344
The amount of waste generated production and consumption	-0.0752	-0.13480	0.0218
Quantity of the neutralized waste production and consumption	0.0536	0.03780	0.0236
Fee for valid and excessive emissions	0.4321	0.02770	0.4499
Emissions of pollutants into the air	0.3626	-0.02730	0.4194
The use of fresh water	0.2558	0.19930	0.1497
Discharge of polluted wastewater into surface water bodies	0.3994	0.22090	0.2674
The gross regional product per capita		0.19870	

- Human development index and the number of neutralized waste production and consumption
- Life expectancy and the number of neutralized waste production and consumption
- Gross regional product per capita and the number of neutralized waste production and consumption
- Gross regional product per capita and life expectancy

The existence of a significant correlation between the dynamics of indicators of values:

- Human development index and volumes of pollutant emissions into the air
- Life expectancy and volumes of pollutant emissions into the atmosphere (Table 6)

Before the interpretation of established relationships should be noted that a significant recognized correlation between the at df equal to 80, if the critical value α of the correlation coefficient was 0.283 for significance level of 0.01. The significant-at a value of α equal to 0.2172 for a significance level of 0.05. For cases of the relationship between life expectancy and the volumes of fresh water use as well as gross regional product per capita,

Table 6: Results of the correlation estimate of the mean value for 2009-2015 growth rates two-way communication. the quality and standard of living-the anthropogenic load on the social and natural environment

Index	Human development index	Life expectancy	The gross regional product per capita
The amount of waste used by the production and consumption	0.0147	0.0460	0.0726
The amount of waste generated production and consumption	-0.0276	-0.0730	0.1119
Quantity of the neutralized waste production and consumption	-0.3283	0.3037	-0.2952
Fee for valid and excessive emissions	0.0310	-0.0674	0.0128
Emissions of pollutants into the air	0.2127	0.2204	-0.0119
The use of fresh water	-0.0895	-0.0161	-0.1389
Discharge of polluted wastewater into surface water bodies	-0.0298	-0.0331	0.1130
The gross regional product per capita		-0.3729	

accepted as conditionally meaningful relationship with a close value pair correlation to the value of α equal to 0.2172 significance level of 0.05.

CONCLUSION

Studies have revealed that there is a significant relationship only with the dynamics of the volume of the neutralized waste production and consumption while negative for the Russian Federation is not characteristic of the conditionality of the index of human development and the number of formed production and consumption waste. This is due to the negative influence of the dynamics of the value of the last parameter on the dynamics of the gross regional product per capita. The relationship between life expectancy and the volumes of the neutralized waste production and consumption and a significant positive. This as well as the presence of a significant positive correlation between the values of the human development index, the gross regional product per capita and the volumes of emissions into the atmosphere and hydrosphere evidence of the extensive nature of the communication system of interaction, "the quality and standard of living-the anthropogenic load on the social and natural environment". This situation implies the existence of the negative elements of the impact of economic growth on the one hand ensuring the improvement of quality and standards of living and on the other, reducing its volume, reducing reserves of human potential. The current period of operation of the socio economic system of Russia is not exacerbated this dilemma definitely not found a significant relationship between life expectancy (one of the human markers) and volumes formed by industrial and consumer waste, discharges and emissions into the ambient air and surface water bodies. However, already shown a negative correlation between the rate of growth of human potential, illustrated by the presence of a significant negative correlation between the dynamics of gross regional product per capita and life expectancy.

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