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QUALITY OF HUMAN LIFE AS AN INDICATOR OF THE ENVIRONMENTAL WELL-BEING

Abstract: The article deals with problem concerning impact environmental well-being have on the quality of human life. The author analyzes theoretical approaches developed by the Eastern European researchers to this topic, as well as their applicability to the Ukraine's data. We form a regression model describing influence of the factors traditionally used by the official statistics for anthropogenic strain factors of an objective (average life expectancy by region) and subjective (individual happiness feeling) nature. The indicators considered as indexes dealing with the quality of humans' life. According to results of the analysis, the author comes to conclusion that environmental factors have a relatively minor role in the quality of the Ukrainian population's life. It justifies the assumption that in case of traditional living conditions typical for a transformational society, such factors as lifestyle are more significant than the ecological well-being.

Keywords: quality of life, ecological well-being, Ukraine

Introduction

Appearance of the “quality of life” concept is usually associated with release of the G. Galbraith's work “The affluent society” (Galbraith, 1958). Popularity of this concept in subsequent decades can be explained by general changes in the understanding of what we mean by the goals of the human economy and society development. Until the 1960s, that is, prior to the formation of welfare society, as the most general measure of social progress were considered indicators dealing with economic wealth,

which in turn was mainly related to volume of GDP and its share per individual. The actualization of social and environmental issues in public discourse led to a real turning point in the attitude of society towards the goals of its progress and development. If the social aspect of these changes was associated with the ideas of equality and wider opportunities for social realization of each individual, their environmental aspect was associated with the ideas of sustainable development put forward by the United Nations Conference in Rio de Janeiro in 1992 (Sapaeva, 2013). Today there are a large number of studies developing the concept of a human life quality. However, despite seeming transparency of the concept, researches related to its use faces challenges caused by complexity of its formalizing. These regard the selection and use of suitable statistical indicators (Trofimov and Maľganova, 2005) including environmental characteristics of the quality of life problem. It is of interest how much this modern concept is used by Eastern European researchers, and how relevant it can be for the realities of such an East European society as Ukrainian.

Theoretical Basis

The need to assess the quality of life has led to development of a wide range of quantitative indices which embrace some of its characteristics. (Their general overview of them presented in the T. Ratushnyak and V. Odinets study Ratušňjak and Odinec, 2013). There are several main approaches that may be used to define the concept of quality of life. One of them somehow or other connected with the methodology appertaining to the Social Development Index, developed in 1970 by the UN Social Development Research Institute, and subsequently advanced into the Human Development Index (HDI) (Talaluškina 2013). This index focuses on the social factors of development. It assumes that the quality of a person's life can be ensured by satisfying his or her economic and social needs. Quality of life is considered as a derived indicator of economic development (Kudriaceva, 2012). Numerous methods for assessing the environmental impact on quality of life were formed by adding the new the environmental component to HDI's three main factors (income, education, lon-

gevity). In the most general form, they represent a model that is a combination of two integral assessments of the following indicators: economic well-being and social well-being (Liga, 2010, Liga, 2011).

The most commonly used formal indicators estimated anthropogenic impact on the environment are follows: emissions of pollutants into atmosphere and emissions of wastewater - as it was done by A. M. Trofimov and I. G. Malganova in their comparative study dealing with the quality of life of Kazan and megacities' of Russia population (Trofimov and Malganova, 2005). They used 30 indicators grouped in social, economic and environmental clusters. The main goal of social development, aimed at improving the quality of life, is the decrease of the most direct factors of anthropogenic impact on environment, such as industrial and household discharges of pollutants into the air and atmospheric basins, soil, as well as the preservation of biological diversity of flora and fauna (Mit'ugina, 2011). I. V. Gukalova offers to introduce a unit of GDP (or GRP) into a such group of factors for analysis (Gulakola 2009, Gukalova, 2013). Here we can observe an indirect relation; in realities of the post-Soviet industry energy-intensive production in most cases implies both high resource intensity and outdated equipment that does not allow efficiently collect polluting waste.

Among other environmental indicators, Russian researchers tend to include a component of climatic conditions, regarding it as having a negative impact on the quality of life. For example, this is done by R. N. Sheveleva (Ševeleva, 2010). The researcher states the severity of climatic conditions in the Krasnoyarsk region of the Russian Federation. However, she does not provide a meaningful analysis of their negative impact on the quality of life of the region's population and does not provide its quantitative assessment, so it makes this position as a matter of the author's taste.

Indicators reflecting the environmental aspect of the quality of human life can be health statistics. The inclusion of such indicators is logical and obvious. The concept of "environmentally dependent pathology" of human health is proposed (Ušakov, 2004). I. B. Ushakov proposed a block diagram of the multicriteria impact of environmental factors on the mental and somatic health of a person. Chemical factors, ionizing radiation,

electromagnetic effects, heliotropic factors are referred to the group of environmental factors. The factors correlate with the corresponding statistical values of risks to human health. The study of N. V. Trofimova points to a close correlation (linear correlation coefficient 0.65) between the number of carriers of the active form of tuberculosis per 100 thousand people and emissions of pollutants into the atmosphere from stationary sources per capita in the Ryazan region of the Russian Federation (Trofimova, 2010). If this relationship is not accidental (the author does not provide indicators that can be used to judge the statistical significance of this indicator), the interpretation of this fact suggests that the mutual influence of factors is complex. Emissions of pollutants into the atmosphere are not a direct provocateur of tuberculosis, however, in combination with other correlating factors of their group (the number of patients with alcoholism, the number of registered crimes per 100 thousand people) may indicate a combination of negative environmental and negative social situations within a certain social models.

In the studies of V. V. Tarasova and I. M. Kovalevskaya, high values of the correlation between indicators of environmental pollution and the indicator of the “health status” of the population of the regions of Ukraine were obtained, the strongest for the level of pollution of the atmospheric basin (Kovalevska, 2013, Tarasova, 2013, Tarasova and Kovalevska, 2012). Unfortunately, the authors do not disclose the method of calculating the health indicator. In general, the inclusion of environmental indicators of quality of life in the group “health” (Gukalova, 2009) raises the question of the possibility of using the indicator of life expectancy as a generalizing indicator. The indicator of interest characterizing the environmental aspect of the quality of life is the share of the territory that has protected status and, thus, is derived from economic turnover (Chapov, 2015). The overwhelming majority of contemporary works by Eastern European researchers of the problem are aimed at creating integral indices of quality of life, including an environmental component. The degree and nature of the influence of environmental factors is usually not carried out, due to which the inclusion of heterogeneous factors becomes somewhat mechanical.

Quality of life can also be viewed as a subjective feeling of the individual, expressing the pleasure of life. In this sense, it coincides with the concept of happiness. For studies of Eastern European scientists such a question is not typical. However, there are quite numerous studies that solve the problem of combining subjective and objective estimates of the parameters of quality of life (Costanza et al., 2008). For example, M. Cox, R. Johnston, and J. Robinson assess the impact of the accessibility of natural landscapes — in this case, the coast, on the quality of life of people in two Australian regions. The authors build a model of quality of life, containing an assessment of the relationship between the objective factors of the ecological state of natural complexes, social relations and the subjective perception of the accessibility and importance of ecological systems by individuals. (Cox et al., 2006). Thus, in relation to the problem of environmental factors of quality of life in Eastern European regions, the task is to assess the impact of these factors on the resulting indicators of quality of life - objective and subjective.

Methods

The author sets the task of assessing the impact of environmental factors on the resulting quality of life indicators on the example of the regions of Ukraine. We use the average life expectancy (ALE) as an objective measure of QL, and the feeling of happiness (HI) as a subjective measure. ALE values are calculated by the State Statistics Service of Ukraine (*Naselenia Ukrainy za 2013 rik: Demografičnij dovidnyk.*, 2014). The values of HI are taken from the data of a nationwide survey of the Kiev International Institute of Sociology OMNIBUS KMIS 2013/05 (OPINIONS AND VIEWS OF UKRAINIAN PEOPLE: May 2013 (KIIS Omnibus 2013/05): The poll was conducted by Kiev International Institute of Sociology). The survey was conducted in 110 locations in Ukraine in a four-stage stochastic sample representative of a population over 18 years of age. In order to avoid distortion of data due to political conditions, the data is taken for 2013. Independent variables are presented by statistical indicators of the ecological state of the environment provided by the State Statistics Committee of Ukraine (Roslinovodstvo

Ukrainy 2013: Statističnyj zbirnyk, 2014, Ukraina v cyfrach 2013: Statističnyj zbirnyk, 2014). The data were translated into relative indicators characterizing the degree of negative human impact on a square kilometer of the territory. For the evaluation, the method of multiple linear regression was used.

Results

We build a regression equation where, independent variables: A - area of land used in agriculture hectares per square meter. kilometer of the territory), E1 and E2 - the volume of emissions of pollutants from stationary and transported sources (tons per sq. km), W- the volume of polluted water discharge (thousand cubic meters per sq. km of territory), Wa - the volume of waste generated 1- 4 hazard classes per square. km of territory). Dependent variables: ALE - average life expectancy (years), HI - the proportion of responding “yes” and “more likely than not” to the question “Do you feel happy?” (%). Strong correlation of independent variables: E1 and W - 0.82, E2 and W - 0.78. The correlation of the dependent variables ALE and HI is negligible (0.031).

The following characteristics were obtained. For the equation of the form:

$$ALE = A + E1 + E2 + W + Wa$$

Adjusted R ²	0.21			
df	19			
F-statistics	2.258			
p-value	0.090			
Variables	Coefficients	t-value	p- value	VIF
Intercept	63.944	54.325	0.000	
A	0.015	0.606	0.552	1.111
E1	0.006	0.174	0.864	3.433
E2	0.773	2.896	0.009	2.640
W	-0.08	-2.062	0.053	4.408
Wa	-0.0002	-1.495	0.151	1.574

It can be assumed that the impact of emissions from mobile sources of pollution (E2), it turns out to be significant, but has a positive impact on life expectancy. This can be interpreted by assuming a link between the intensity of the use of personal vehicles and the standard of living. Close to the accepted threshold of statistical significance is the p-value for the variable W, which has a negative effect on the dependent variable.

Among the areas with the lowest life expectancy are areas with a clearly high anthropogenic load on the environment (Donetsk, Dnipropetrovsk), and areas that are commonly referred to as the most environmentally friendly (Chernihiv, Sumy). This group of regions is characterized by a long-term tendency towards stagnation and even a decrease in the average life expectancy. (Čepelevska and Rudnickij, 2014). Although this is not reflected in the model, which includes all regions of Ukraine, for the Donetsk and Dnipropetrovsk regions there is a combination of a high proportion of air emissions from stationary sources and low average life expectancy.

A characteristic feature of national emissions is a significant content of specific harmful impurities, which make up one third of the total volume, 20% priority toxic substances (ammonia, hydrogen sulfide, phenol, formaldehyde, fluoride and hydrogen chloride, benzopyrene, etc.). Almost half of the emissions of toxic substances is carried out by enterprises of Donetsk and Lugansk regions. The share of emissions of volatile organic compounds in the territory of the Donetsk region is 70-80% of national emissions (Baštannik et al., 2014). For the Kharkiv region, which is the fourth, with a large margin, in terms of total emissions from stationary sources, sulfur dioxide emissions are of the greatest importance (Maksimenko et al., 2014). Probably, the exceptional concentration of the most environmentally harmful industries in a small number of oblasts does not allow observing their negative impact on average life expectancy using this method of analysis.

For the equation of the form

$$HI = A + E1 + E2 + W + Wa$$

completely unsatisfactory statistical characteristics were obtained (adjusted R^2 -0.127, p-value 0.8017).

Discussion

Thus, we cannot talk about the reliable and obvious influence of environmental factors on the quality of life of the population of Ukraine. Somewhat unexpected is that we did not find the dependence of the quality of life indicators on the degree of anthropogenic environmental impact on agriculture, which is a significant feature of the Ukrainian economy. This makes the following assumptions:

1. The main indicators of anthropogenic impact presented by official statistics are not an actual characteristic of the anthropogenic environmental impact of the regions of Ukraine. This forces us to look for alternative statistical indicators, including those that would have a positive meaning and reflect the degree of use of positive factors of the environmental environment.

2. Comparatively more important to the quality of life is the way of life of people, which compensates for the influence of harmful environmental factors.

Higher incomes, greater availability of high-quality medical care, more modern living standards in the case of Ukraine may compensate for the negative aspects of anthropogenic environmental impact associated with vigorous economic activity. Indirectly, this circumstance is reflected in research on the life expectancy of the population of Ukraine, which is higher in cities and large cities (Lubinec, 2010), which is not typical only of the Transcarpathian region (Nazarova, 2012). Despite the relatively large environmental risks.

The lack of a connection between environmental factors and a subjective feeling of happiness suggests that the environmental aspects of life are not perceived as meaningful for Ukrainians. The ecological style of life, like the modern understanding of the concept of quality of life itself, is associated with slightly different, more progressive social relations, which are only to a limited extent characteristic of modern Ukrainian society. This circumstance deserves further research by Eastern European scientists, which may lead to a change in the modern research paradigm of “mechanical” indices and too direct links.

Bibliography

COSTANZA, R., FISHER, B., ALI, S., BEER, C., BOND, L., BOUMANS, R., DANIGELIS, N. L., DICKINSON, J., ELLIOTT, C., FARLEY, J., GAYER, D. E., GLENN, L. M., HUDSPETH, T. R., MAHONEY, D. F., MCCAILL, L., MCINTOSH, B., REED, B., RIZVI, A. T., RIZZO, D. M., SIMPATICO, T. & SNAPP, R. 2008. An Integrative Approach to Quality of Life Measurement, Research, and Policy. *S.A.P.I.E.N.S [Online]*, Vol.1, P. 17-21.

COX, M. E., JOHNSTONE, R. & ROBINSON, J. 2006. Relationships Between Perceived Coastal Waterway Condition and Social Aspects of Quality of Life. *Ecology and Society*, Vol. 11, (online).

GALBRAITH, J. K. 1958. *The affluent society*, Boston,, Houghton Mifflin.

OPINIONS AND VIEWS OF UKRAINIAN PEOPLE: May 2013 (KIIS Omnibus 2013/05): The poll was conducted by Kiev International Institute of Sociology. Available: <http://ukraine.survey-archive.com/data#user-research@showResearch=116425>.

BAŠTANNIK, M. P., ŽEMERA, N. S., KIPTENKO, E. M. & KOZLENKO, T. V. 2014. Stan zabruždenia atmosfernovo povitria nad teritoryu Urrainy. *Naukovi praci Ukrainskobo naukovo-dospidnovo gidrometeorologičnovo institutu*, s. 70 - 93

GUKALOVA, I. V. 2009. *Jakist' žitt'ja naselenňja Ukrainy: suspil'no-geografična konceptualizacia*, Kyiv, Institut geografii NAN Ukrainy.

GUKALOVA, I. V. 2013. Status kategorii "jakist' žitt'ja naselenňja" v geografii i sučasna ii dynamika u regionach Ukrajinjy. *Ukrajinskyj geografičnyj žurnal*, s. 48-55.

KOVALEVSKA, I. 2013. Statističnyj analiz ta ocinovanňja vlyvu ekologičnovo stanu dovkil'jana zdorovja naselenňja i jakist' žitt'ja ľjudyny. *Visnik Kyivskobo nacional'novu universyteta imeni Tarasa Ševčenka. Ekonomika.*, s. 30-32.

KUDRJACEVA, S. S. 2012. Intergraľnyje ocenki kačestva žizni naselenia. *Vestnik Kazanskovo technologičeskovo universiteta*, vol. 15, pp. 259-264.

LIGA, M. B. 2010. Metodiki ocenki kačestva žizni. *Vestnik Zabajkalskovo gosudarstvennovo universiteta*, pp. 92-99.

LIGA, M. B. 2011. KAČESTVO žizni: genezis idej. *Učonyje zapiski Zabajkalskovo gosudarstvennovo universiteta. Seria: Sociologičeskie nauky*, pp. 237-244.

LUBINEC, O. V. 2010. Stan ta prognoz serednoi očikuvanoj tryvalosti žytтя naselenňja v Ukraine. *Zdorovja nacii.*, s. 15-23.

MAKSYMENKO N. V., RIZNIK, K. Ju. & ALEKSANDROVA, A. S. 2014 Antropolegčnyj vlyv na prirodne seredoviše. *Luđina ta dovkillia. Problemy neoekologii.*, s. 81-85.

MIŤJUGINA, M. M. 2011. Ekologičeskaja bezopasnosť kak osnova obespečenia kačestva žizni naselenia. *Vestnik Čuvašskovo universiteta*, pp. 449-453.

NAZAROVA, O. Ju. 2012. Seredňja tryvalist' očikuvanovo žitt'ja pri naroždenni jak indykator demografičnovo stanu krajiny. *Visnyk Charkibskovo nacional'noho universytetu imeni V. N. Karasina. Serija : Eonomična*, C. 72-76.

Naselenňja Ukrainy za 2013 rik: Demofaričnyj dovidnyk., 2014. Kyiv, Deržavna služba statystyky Ukrainy

RATUŠŇJAK, T. V. & ODINEC, V. A. 2013. Sučasni pidchody do vymirjuvanňja jakosti žytt'ja. *Naukovyj visnyk Nacional'noho universytetu deržavnoi podamkovoji služby Ukrainy (ekonomika, pravo).*, c. 43-50.

Rislinovodstvo Ukrainy 2013: Statystičnyj zbirnik, 2014. Kyiv, Deržavna služba statystyky Ukrainy.

Sapajeva, L. S. 2013. Socialni pokaznyky ta ichňja transformacija na riznyh etapach suspil'noho rozvitku. *Visnyk Charkivskovovo nacional'noho universytetu imeni V. N. Karazina. Sociologični doslidženňja sučasnoho suspil'stva: metodologija, teorija, metody.*, Vyp. 30, s. 153-157.

TALALUŠKINA, Iu. N. 2013. Opyt OON v issledovanii kačestva žizni naseleňja. *Ekonomičeskij žurnal*, vol. 31, pp. 46-53.

TARASOVA, V. V. 2013. Ocinka vylyvu ekologičnovo stanu dovkill'ja na zdorovja naselenňja. *Agrosvit*, pp. 3-6.

TARASOVA, V. V.. & KOVALEVSKA, I. M. 2012. Faktory vlyvu dovkill'ja na stan zdorovja naselenňja. *Visnyk Žytomyrskovo nacional'no agroekologično universytetu*, pp. 287-292.

TROFIMOV, A. M. & MAL'GANOVA, I. G. 2005. Ocenka kačestva žizni naselenia kak forma izučenia social'no - geografičeskoprostranstva. *Geografičeskij vestnik*, pp. 36-43.

TROFIKOVA, N. V. 2010. Integral'najaocenka kačestva žizni naselenňja. *Izvestija Tul'skovo hosudarstvenno universityta. Ekonomičeskije i juridičeskije nauki.*, pp. 91-100.

Ukraina v cyfrach 2013: Statystičnyj zbirnyk, 2014. Kyiv, Deržavna služba statystyky Ukrainy.

UŠAKOV, I. B. 2004. Ekologičeskij risk i kačestvo žizni. *Ekologia čeloveka*, pp. 7-14.

CHAPOV, V. 2015. Analiz integral'no pokaznyka jakosti žytt'ja naselenňja. *Ekonomičnyj analiz*, T. 19 (1), pp. 101-107.

ČEPELEVSKA, L. A. & RUDNYCKYJ, O. P. 2014. Serednja očikuvana tryvalist' žytt'ja jak kryterij mediko-demografičnoi sytuacii v Ukraini. *Visnyk social'noi gigieny ta organizacii ochorony zdorovja Ukrainy*, pp. 39-43.

ŠEVELEVA, R. N. 2010. Metodika ocenki prognozovania kačestva žizni naselenia. *Sibirskij žurnal nauki i tehnologij*, pp. 211-215.