

ROLE OF NATURAL RESOURCE POTENTIAL IN ECONOMIC GROWTH OF UKRAINIAN ECONOMY: INSTITUTIONAL DIMENSION

Contemporary development of Ukrainian economy is associated with strengthening of a number of factors determined by the state of environment. First of all, the stock of natural resources should be mentioned because they form material and technical base of production. Natural resources acquired especial importance for production industry in Ukraine because the part of material expenditures was 64,0% in 2010-2011 [1, p. 108]. Significant consumption of natural resources by native industrial plants determines insufficient effectiveness of business activity with unsatisfactory results. The part of operating costs in the total volume of the products sold in 2011 was 95 kop. per 1 UAH in industry and it exceeded 102,7 kop. per 1 UAH in processing industry [1, p. 109]. At these conditions, correct establishment of the place and role of natural resources in business activity of industrial plants is an actual problem that allows adequate application of the principles of sustainable development to the practice.

Global ecological challenges force societies to develop and implement the principal new approaches in order to provide growth of economy. Principles of sustainable development declared in 1992 in Rio de Janeiro were aimed at harmonic adoption to balanced nature management and maximization of satisfaction of needs of contemporary and future generation and resulted in certain positive changes. Participation and access to ecological information and justice as obligatory components of viable society should be considered as the most successful principles realized for now. At the same time, specialists recognize that along with successful realization of politics of sustainable development a number of problems arise related to low tempo of economic growth, intensification of poverty, increase in ecological problems, accel-

erated extinction of species, famine and the rate of spread of diseases. The data reported on the conference Rio+20 proved inefficiency of application of the principles of sustainable development, low level of coordination, sequence and consistency of actions of separate individuals and society as a whole [2]. These problems concern the development of the Ukrainian economy as well.

The problems of assessment of the place and role of natural resources in business activity in industry were considered in a number of papers. In the works of R.F. Nash and D.W. Pearce models of social development were formulated based on the consumption of natural resources with respect to stability principles [3; 4]. The necessity of ecological management was emphasized in the works of I. Alexandrov and A. Polovyan [5]. The researchers stated special importance of the development of strategies of sustainable development of industrial regions based on balanced system of economy, ecology and social sphere [6]. The papers mostly interpreted economic parameters of natural resource management in activity of industrial plants. At the same time natural resources obtain both social and ecological importance affecting the expense structure and the value of the profit.

The present paper is aimed at specification of the conception of natural resources and establishment of their place and role in the development of the national economy in realization of the politics of sustainability in Ukraine.

Economy of Ukraine is affected by negative consequences of global financial economic crisis of 2008. In these conditions the solutions of the problem of rational management of natural resources at simultaneous economic growth are considered separately. This situation is related to the fact that in Ukraine the main empha-

sis in the management of natural resource potential is put on the establishment of property rights and legal regimes, which guarantee the excess of rent for individual agents. Maximization of added value is provided by means of elimination of a wide range of consumers out of the process of management of natural resources (often by illegitimate methods), corruption and bureaucratic schemes of obtaining rights to use natural resources. Small business, that displays the interests of the majority of the population of Ukraine, becomes unprofitable, which intensifies the poverty of the national economy. Decision making in large corporations involved in the extraction and processing of natural resources in

Ukraine based on generation of profit is the legitimate possibility of transferring responsibility and payment for environmental pollution and depletion of natural resources to the state. And the lack of «fair» money value of natural resources and ecological damage results in excessive production of private welfare with a minimum production of public welfare. As a result disproportions accumulate that endanger a possibility of long-term economic growth. Natural resources are considered as welfare with the characteristics presented in Table 1. These characteristics should be taken into account in the development of mechanisms of providing long-term economic growth in Ukraine (see Table 1).

Table 1

Characteristics of natural resources as welfare

PHYSICAL CHARACTERISTICS	SOCIAL CHARACTERISTICS	ECONOMIC CHARACTERISTICS
Physical limitation, non-uniformity of placing	Natural right of human, life comfort for agents, institutional rules in consumption	Object of utility
Speed of accumulation and recovery	Compulsory exception from using process	Free wastes assimilation
Depletion, degradation	Forming a status in society *	Means of production and objects for consumption
Transformation of physical state	Behavior of actors *	Services (recreation, transport etc.)

* Developed by authors

Neoclassical economy requires strict differentiation and separation of economic system from natural and social ones. Natural capital is considered as a source of material-substantiated welfares, which can be used in the course of production of welfare being free of charge except the cost of extraction. Development is reflected by growth of gross domestic product or regional product affected by deficiency of separate resources and stimulated by technical progress. Namely, the last factor of promotion counteracts depletion of natural capital and permits to diminish costs on extraction of natural resources. Substitution of resources and the type of capital is an infinite process and depends only on technological progress (*Cobb-Douglas model*). Based on the conception of sustainable development the economic progress is viable when resource potential of management subject remains constant for a long time. Constant value

of resource potential can be achieved at the expense of compensation of resources consumed in processes of economic management by other resources. Such optimization does not allow the support of the physical and cost characteristics of resource potential as technological substitution can be realized in favour of reduction in price and diminish quality resources attracted to production. Therefore such type of sustainability should be considered as a weak one [7].

Contemporary paradigm of development is supplemented by ecological economy that tries to overcome disadvantages of neoclassical economy. The main ideas generated within the limits of ecological economy are as follows. The first trajectory is oriented to the law of property that can be established in the market of externalities. The problem of limitation of economic growth as a result of environment pollution is got over by pollutants and recipients through

trade by laws, which excludes necessity of state interference (model of R. Coase). The result is the «polluter pays» principle and the trade of marketable pollution permitted. The second trajectory of ecological economy is the approach of balance materials, which characterize the limits of development by entropy. In this sense pollution of environment and depletion of resource potential are not only the results of market refusal but also an inevitable phenomenon conditioned by laws of thermodynamics that force government to fix acceptable levels of pollution from the position of social and private criteria [8].

Disciplinary sphere of ecological economy is aimed at three main purposes: first, estimating and ensuring that the scale of people activity is ecologically viable; second, ensuring that distribution of resources is equitable within

the limits of current generation, between future generations and between species; and third, the effective assignment of market and non-market resources with account of the limits of development. Natural capital, human capital and interdependent artificial capital are interdependent and largely complementary [9]. The conception of sustainable ecological economy is linked with elasticity of natural and artificial capital and with human resources. This means that the production of welfare requires a rigorous combination of resources, the substitution of which results in a welfare that cannot be compared with the other ones with respect to consumer characteristics. Therefore, sustainable development of Ukrainian economy can be achieved through the development of natural resource potential (see Table 2).

Table 2

*Peculiarities of failures of environmental management in Ukraine**

FAILURE OF MARKET	FAILURE OF GOVERNMENT
Minimal government intervention	Authority over economic well-being of consumers natural resources
Priority of economic decision making criteria	Priority of social decision making criteria
Externalities are paid by third parties (the concept of "black driver")	Government subsidizes the solution of environmental issues
Priority of the private welfare	Priority of the collective welfare
Unregulated profit-oriented natural monopoly	Monopolization of the right of choice of technology and the subordination of public interests to private purposes of the authorities

* See [7, 10]

In general, effectiveness of any decision or action is evaluated from the position of comparing the results and the cost of achieving these results. From the position of evaluation of rational nature use and provided economic growth for both producers and consumers the effectiveness should be calculated as a ratio of the volume of used goods and services and the quantity involved in ensuring the production of natural resources. As a consequence, the effectiveness related to consumers can be assessed as follows:

$$SR = \frac{CN}{R}, \quad (1)$$

where SR is the effect of natural resources on economic growth, UAH / conventional ton; CN is the level of satisfaction of consumer needs (Gross Domestic Product), million UAH;

Risfuel and energy resources used, conventional ton.

Effect of natural resources on economic growth is calculated by (1) permits to evaluate the level of welfare and economic growth. However, there are some absent characteristics affecting the consumer behavior direction:

- 1) the access to information about environmental properties of products and services, that is operative, complete and trustworthy;
- 2) the conformity of product produced to social institutions (norms, values, traditions);
- 3) the value of consumption of products produced (including the payment of taxes, consumption of fixed capital, intermediate consumption of goods, material and non-material services for industrial needs).

Formula (1) requires taking into account the above three features, which can be successfully implemented with the extension method to become the multiplicative factor model, where economic, environmental and social components of economic growth are presented:

$$SR = \frac{CN}{R} \cdot \frac{P}{EP} \cdot \frac{EP}{R} = R_{econ} \cdot R_{soc} \cdot R_{ecol}, \quad (2)$$

where P is the population size, thousand person; EP are total ecological costs (ecological payments, fines, capital investments in environmental protection, the current ecological costs of agents), thousand UAH; R_{econ} is the economic component of economic growth, million UAH / person; R_{soc} is the social component of economic growth, person / UAH; R_{ecol} is the ecological component of economic growth, million UAH / conventional ton.

The economic component of economic growth is a universal measure of social wellbeing, the growth of which in time should be provided rather by growth of GDP than by the population growth. Social component of economic growth is reflected in the number of people who must pay 1 UAH of the total sum of

ecological costs carried by economic agent. A part of the costs is included in the price of the product, and another one is paid from net profits. Because of reduction in the amount of profit, and limitation or reduction of opportunities in economic activity in the future, the second part will affect the consumer effectiveness of development.

The last component demonstrates the ecological effectiveness of the consumer's ecological behavior stimulation and allows estimating the fraction of the total ecological costs of society conditioned by the use of fuel and energy resources. Maximization of the significance of the last element should include advance reduction in consumption of fuel and energy resources while reducing the total environmental costs.

The results of the assessment of economic, social, and ecological components of economic growth are presented in Table 3. They illustrate a uniform increase in the economic component (the average rate of annual growth is approximately 27,8% per year) (see Table 3).

Table 3

Analysis of the economic, social, and ecological components of economic growth in Ukraine

Indicators	Years					
	2005	2006	2007	2008	2009	2010
CN^*	441452	544153	720731	948056	913345	1094607
P^*	47,3	46,9	46,6	46,4	46,1	46
EP^*	7089,2	7366,6	9691	12176	11073,5	13128
R^*	170	174,3	175,7	166,4	137,7	149,6
SR	2596,78	3121,93	4102,05	5697,45	6632,86	7316,89
R_{econ}	9333,02	11602,41	15466,33	20432,24	19812,26	23795,80
R_{soc}	0,0067	0,0064	0,0048	0,0038	0,0042	0,0035
R_{ecol}	41,70	42,26	55,16	73,17	80,42	87,75

* <http://ukrstat.gov.ua/>

In 2005-2010 the economic effectiveness increased from 9333,02 million UAH per person to 23795,80 million per person. This indicates the growth of production and consumption of public welfares that is one of the manifestations of improvement of well-being of society. A similar positive dynamics is observed in increasing the size of the ecological effectiveness of stimulation of ecological behavior (average annual growth rate is about 22% per year). In 2005

the indicator was 41,70 million UAH per conventional ton of fuel and energy resources, which were traditionally considered to be exhaustive and non-renewable; in 2010 the level of spending on environmental protection and restoration of natural-resource potential by consumption of 1 conventional ton of fuel and energy resources constituted 87,75 million UAH (the growth rate was practically 2 times higher). Social component tended to improvement. In this

case, the inverse value of R_{soc} yields the amount of the total ecological costs attributable to one person living in Ukraine. In 2005 the value of R_{soc} was 0,0067. This expression means that one person has in average 149,88UAH of total ecological costs of rational environmental management and reproduction quality of the environment. At the end of 2010 the level of R_{soc} reached 0,0035. This fact indicated a significant increase in the level of total environmental payments, the absolute value of which was 285,39UAH / person. Growth rate of effectiveness due to social component for the period of 2005-2010 constituted 1,9 corresponding to the rate of growth of effectiveness due to the ecological component.

At the same time, revealed positive dynamics of growth of the economic, social, and ecological components can be considered in terms of "price" paid by society for satisfaction of its own requirements. From this position, the GDP growth as an indicator of social wellbeing cannot get a positive evaluation. With the growth of the absolute volume of consumption of natural resources and the gradual depletion of the natural resource potential, society pays not only the ecological costs associated with the implementation of measures for rational environmental management, protection and reproduction of natural resource potential, but also the ecological costs aimed at the intensification of extraction, processing and consumption of natural resources, obtaining of ownership and control over limited natural resources in order to receive an excess of rent or to prevent and eliminate the negative effects of depletion of natural resource potential, which results in complication of conditions of personal and professional business activity.

Consumer awareness of the importance of integrating ecological, economic and social factors explains the emergence of markets for environmentally friendly products, where the level of satisfaction from the direct consumption is not lower than the level of satisfaction of awareness that production and consumption of the product or service does not damage the environment or even improves it. According to specialists' estimate, the rate of growth of the markets for environmentally friendly products often exceeds the growth in traditional sectors. This fact is usually characterized as green boom comparable to the digital boom. According to analytical company «New Energy Finance»,

energy investments in 2008 amounted to about 350 billion USD; 155 billion USD accounted to renewable energy: from 2004 to 2008 there was an average annual increase by 50%. According to German consulting firm Roland Berger, in 2008 the world market of economical goods and services amounted to 1.4 billion USD, and it is expected to double by 2020 [11].

In the national economic entities are characterized by the use of a number of formal attributes of environmentally friendly products in order to attract customers and achieve growth and the level of profit at the cost of these sales. In particular, for this purpose eco-labels are introduced (for example, Green Crane in Ukraine, Blue Angel in Europe) and environmental infrastructure is created (environmental insurance, tax credits, etc.) [12-14]. Nowadays it is necessary to ascertain high level of ignorance and incompetence of customers that are expected to choose environmentally friendly products. First of all, the signs of ecological quality of products are not identified by consumers. This fact demonstrates that the environmental safety of production and consumption of the product is not the main evidence of quality because the main evidence of quality is traditional price and quality ratio. Secondly, the manufacturers label products by signs of ecological quality using mainly the standards of ISO 9000, 14000, 26000. However, the existence of such labels indicates high quality of the management process without revealing the content of characteristics of the ecological quality of the product itself.

An essential mark of quality for today can be compulsory indication on the packaging of the absence of GMOs in the composition of products offered in the Ukrainian market. However, due to the lack of consistency in the sanitary requirements of Ukraine and the number of states that are importers and exporters in the Ukrainian market, a number of dangerous products enter the Ukrainian market and increase the volume of trans-boundary pollution. Investment policy of nature conservation technologies is replaced by policy of payment fines for breaking environmental laws, because the amount of presented fines is hundred times less than the amount of investment required. Thus, in the Ukraine we can watch a determinate "imitation" of environmental consciousness, increase in the level of irrationality of consumption of natural

resources, domination of politics of "quick money" without taking into account the interests of future generation.

The present investigation illustrates the need of simultaneous account of social, economic, and ecological characteristics of natural resources as welfare. This approach allows formulating a model of estimation of interrelation between the welfare produced and natural resources consumed. The practical application of the suggested model based on official statistics permitted establishment of the priority of economic component in decision-making in the area of natural resource management and economy progress as well as insufficient account of social and ecological consequences of these decisions.

Further research can be directed towards new applications and case studies. Adaptation and application of the proposed model to other developing countries will likely demonstrate the flexibility and usefulness of the model in addressing the trade-off between economic growth and environment, and can contribute to substantiating policy conclusions that emphasise the natural resource development, poverty reduction, and price incentives in advancing both of these development goals.

References

1. Статистичний щорічник України за 2011 рік / [ред. О.Г. Осауленко]. – К. : Державна служба статистики України, 2010. – 558 с.
2. Le Blanc D. Special issue on institutions for sustainable development / D. Le Blanc // *Natural Resources Forum: A United Nations Sustainable Development Journal*. – 2012. – Vol. 36. – P. 1-22.
3. Nash R.F. *The Rights of Nature: A History of Environmental Ethics* / R.F. Nash. – Madison : University of Wisconsin Press, 1989. – 320 p.
4. Pearce D.W. *The Economics of Sustainable Development* / D.W. Pearce, G.D. Atkinson, W.R. Dubourg // *Annual Review of Energy and the Environment*. – 1994. – № 19. – P. 457-474.
5. Александров И.А. Оценка экономической эффективности экологического менеджмента предприятия / И.А. Александров, А.В. Половян, А.С. Окуловская // *Економічний вісник Донбасу*. – 2011. – № 1 (23). – С. 111-118.
6. Сталий розвиток промислового регіону: соціальні аспекти: моногр. / О.Ф. Навікова, О.І. Амоша, В.П. Антонюк та ін.; НАН України, Ін-т економіки пром-сті. – Донецьк, 2012. – 534 с.
7. Dementiew V.V. *Umweltorientierte Ausbildung an ukrainischen Universitäten, Netzwerke und Nachhaltigkeit im Transformationsprozess* / V.V. Dementiew, O.Y. Popova // *Kooperationsprojekte mit Mittel- und Osteuropa*, 2007. – P. 183-191.
8. Boulding K. *The Economics of the Coming Spaceship Earth* / K. Boulding // *Environmental Quality in a Growing Economy*. – Baltimore, MD: Resources for the Future / Johns Hopkins University Press Johns Hopkins, 1966. – P. 3-14.
9. Williamson O. *The Economic Institutions of Capitalism* / O. Williamson. – New York: Free Press, 1985. – 450 p.
10. Dementiew V.V. *Zustand und die Perspektiven der Förderung umweltorientierter Entwicklung von ukrainischen Unternehmen* / V.V. Dementiew, O.Y. Popova // *Wdrażanie Rozwoju Zrównowżonego: Strategie i Instrumenty*. – Częstochowa: Wydawnictwo Akademii Polonijnej w Częstochowie "Educator", 2008. – P. 293-305.
11. Kolstad Charles D. *Environmental Economics* / Charles D. Kolstad. – Oxford University Press, UK, 1999. – 416 p.
12. Costanza R. *Ecological Economics: the science and management of sustainability* / R. Costanza. – Columbia: University Press, 1991. – 525 p.
13. Costanza R. *What is ecological economics* / R. Costanza // *Ecological Economics*. – 1989. – Vol.1. – P.1-17.
14. Frey R.F. *Mit Ökonomie zur Ökologie. Analyse und Lösung des Umweltproblems aus ökonomischer Sicht*, Überarb., unterg. Aufl. / R.L. Frey, E. Staehelin-Witt, H. Blöchliger (Hrsg.). – Stuttgart: Stuttgart: Helbing & Lichtenhahn, Basel/Frankfurt am Main, 1993. – 308 s.

Received on 11.04.2013.