THE INTERNATIONAL EXPERIENCE OF THE INNOVATIVE APPROACH OF BIODIVERSITY'S PRESERVATION

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Abstract

The organizational structure of public administration of biodiversity conservation of Ukraine has been investigated. The government biodiversity conservation effectiveness has been analyzed. The best practices of public administration and recommendations for its implementation in Ukraine have been learned.

Keywords: public administration ecology politics, biodiversity, state system.

Introduction

In the last two decades the world began to feel the threatening climatic changes. Special problems are caused by the state of atmospheric air, its extraordinary pollution by harmful substances and above all by carbon dioxide. The improvements of the situation may become possible only with the introduction of nature protection projects, energy saving production and ecologically clean equipment. However such products are too expensive for Ukraine which only starts building its stable economy. In this aspect the introduction of the Kyoto Protocol can hardly be overestimated.

On February 4, 2004, Ukraine ratified the Kyoto Protocol. It is known that carbon as a biogenic matter is mainly stored for a long time in the forests. That is why in this work basic attention is concentrated on the comparison of forest areas and the ability of Ukraine's and its country neighbours' forest ecosystems to deposit carbon and at the same time on the determination of perspective economic benefits which some of them can receive as strategic partners while the Kyoto Protocol is being realized.

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Forestry organization and forest cover in Poland, Ukraine and other selected countries

In Poland, for example, forest area of 9 million hectares and forest cover was 28.8% of the total area of the country. For one person it was an average of 0.24 ha of forest. The State Forestry «Forests Panstvove» includes 428 *nadlisnytstv*, which are subdivided into 5680 forest. Headed «Forests Panstvove» by general director, which is subject to the general direction of the Bureau State Forest, and 17 regional directorates. The structure of the State Forestry «Forests Panstvove» also includes:

- forest general bank in Kostshytse;
- Cell culture Holuhovi timber;
- Information Centre national forests in Warsaw;
- The center of the development and implementation Bedonyu;
- Cell Technology Yarochini timber;
- Department of Informatics state forests in Lodz;

The basic unit in the management of forests is *nadlisnytstva*. Integral part of the General Directorate of State Forests are also complex 9 Conservation of Nature and 11 regional inspectorates. In the State Forestry «Forests Panstvove» with more than 26,000 people.

In Ukraine, forest conservation is the care of the State Agency of Forest Resources. Forest management at the local level state enterprise that are managed by the State Agency of Forest Resources of Ukraine and coordinated by its appropriate regional authority (Reskomlis Crimea, 24 regional departments of forestry and hunting).

The economic evaluation of Ukraine forest and wetland ecosystems effectiveness was carried out in this research due to the fact that forested and open wetlands cover about 20 % of Ukraine (Table 2).

Although Ukraine has a larger area of the territory which is occupied by forests than Poland, but the proportion of the total territory is of nearly half.

Knowing that on the average one hectare of the forest educes annually 5 tons of oxygen and soaks up 20 tons of carbon dioxide and also the oxygen consumption norm per capita, in this research we have calculated the annual mass of carbon deposition by the forests and have defined general quantity of the population the vital functions of which will be provided with oxygen. It turned out that Poland, Ukraine, Romania, Czech, Slovakia, Hungary and Russia are the oxygen donors for other countries. Thus, there was calculated the surplus of nominal quantity of population of these countries which can be provided with oxygen in the countries where forest ecosystems are in a deficit. For example, as my calculations prove, above its

own quantity of population, Poland provides oxygen for 68.7 million persons, Ukraine – 67.3 million, Romania – 59.7, Czech and Slovakia – 41, Hungary and Russia accordingly 9.4 and 3 million persons.

Tab.1. **The Comparison of Forest cover in Poland and Ukraine**

Country	Area of forests, thousand ha	Share of forest, %	Area of Nature Protection Fund (NPF), thousand ha	Share of NPF from the total territory, %	Specific indexes			
					Forest on a one ha territory	Area of NPF on a one ha territory	Forest per one person, ha/ person	NRF, per one person, ha/ person
1	2	3		4	6	7	8	9
Poland	8890	28,5	7130,4	22,8	0,284	0,228	0,233	0,187
Ukraine	10400	15,9	3670,5	5,4	0,173	0,06	0,23	0,07

Source: own elabaration.

In Byelorussia and Moldova 9.7 and 4.1 million persons accordingly lack oxygen. It means that these countries have to compensate its lack at the expense of the higher mentioned states. It is clear that according to the Kyoto Protocol they would have to pay the costs or invest money into nature protection technologies. In this work an economic effect from annual absorption of carbon dioxide by the forests has been calculated.

Thus, Russia is the leader (177300 million), the second place is taken by Ukraine (1880 million), the third place by Poland (1740 million), further on goes to Romania (1340), Slovakia and the Czech Republic– 920, Hungary – 320, Byelorussia – 10,2 and Moldova only 3,6. I consider that the expected economic efficiency of forest ecosystems must be taken into account in the National Domestic Product in every country, as it works, for example, in Japan.

Protecting biodiversity

The best way to protect biodiversity is a creation of preserved territories. This work is devoted to the improvement of the process of economical stimulation development of the natural-protected fund (NPF) of Ukraine in the transferred economy. In this work the social-economic and ecological essence of NPF have been investigated, the main directions and measures of economic stimulation of the NPF have been offered.

The necessity of increasing of square of the NPF has been grounded in the work (it must be near 20 % of the total square of Ukraine).

The new methodic of economic estimation of evaluation of the NPF functioning, as a basic of economic stimulation has been developed. This methodic allows to take into account climate-creating, atmosphere-saving, water-purifying, health-protecting functions of natural ecosystems of biodiversity and is an important instrument in the realization of Kyoto Protocol mechanisms.

The new methodic of economic estimation of evaluation of the biodiversity's functioning has been based on the conception of total economic value (TEV) and consists of such components:

$$TEV = DV + IV + OV + EV \quad (1)$$

where DV – direct using value; IV – indirect using value; OV – value of future information; EV – estimation value of biodiversity.

The economical estimation of natural preserves and national natural parks of the NRU has been done in this investigation. The results of such calculation: economical effect of functioning 1 ha of preserve has been near 250 dollars and more every year. Therefore it is important to save biodiversity in natural condition.

The research showed that in the modern practice of biodiversity cost-effectiveness evaluation, there are not any elaborated methodological approaches, due to the following reasons:

1. There is not any real market value of natural and social resources, and as a result, the use of subjective assessments designed on economically unsound manner;

2. The lack of legal framework in evaluation of this kind in general and biodiversity in particular;

3. The Departmental approach to the assessment, development methodology was done by organizations subordinate departments, engaged in the use and reproduction of this type of resource.

Today, Ukraine cannot stay away from the prevailing world market ecosystem services due to the threat of global ecological crisis. The national economy formation delay leads to the annual loses of foreign investment in the environmental performance development. The following areas of the market ecosystem services [8]:

1. Genetic resources market of country-members of the Convention «On Biological Diversity» (Article 15). Access to genetic resources and equitable sharing of benefits from their use (strains of microorganisms, including industrial, pharmaceutical raw materials of plant and animal breeding resources, materials cryobanks);

2. Quotas market for carbon emissions and carbon sequestration by promoting forest regeneration (Kyoto, 1997). According to this Ukraine can receive $7.5 billion. every year;

3. «Debt for nature» market. (Poland, Bolivia, Costa Rica, Madagascar) The restructuring of external debt ($ 104 billion or 88,9 % of GDP). The ecotourism development investment, restructuring of enterprises which damage the unique natural objects (World Bank, World Resources Institute, the United Nations);

4. Ecosystem services market associated with the contribution of natural ecosystems to the global stability of the biosphere. The idea of international mutual payments for maintaining of global stability was signed by developed countries in Rio de Janeiro and leads to the payments of 0,7 % of GDP. In Ukraine such compensation may be between 2-6 % of GDP.

The generalization of domestic and international experience, presented in experts works [1-9] allowed to differentiate six approaches to economic evaluation of biodiversity functioning (economic assessment based on the final national economy results, socio-economic assessment, experts review, costly techniques, rental approach and the total economic value concept). The most promising is the total economic value concept, as it provides a comprehensive approach to assessing biodiversity [8, 9].

The calculation of economic efficiency of Ukraine forest and wetland ecosystems was carried out on the basis of the developed methods, which are based on the concept of total economic value. The results are shown in Table 2.

Tab 2. **Economic efficiency calculation of biodiversity in Ukraine**

№	Indicator	Calculation results		Total
		Forest Ecosystems	Wetland ecosystems	
1	2	4	5	6
1.	The economic effect of savings on the purchase of industrial wastewater treatment plants due to natural water purification, million dollars	-	85,8	85,8
2.	The oxygen production million tons	52,78	7,05	59,83
3.	The number of people whose livelihoods ensured by oxygen, million persons	130	17	147
4.	The economic impact of clean air, million dollars	1583,4	211,5	1794,9
5.	The total economic impact on the natural functioning of ecosystems million dollars	–	–	1880,7
6.	The economic operation effect per 1 ha, dollars	150	316,3	466,3
7.	The share of natural capital in comparison with the state budget (2013),%	4,4	0,6	3,01

Source: own elaboration

So, as calculations show, an annual economic impact of Ukraine wetlands wastewater treatment is about $86 million. The total mass oxygen deposition from forests and swamps is about 60 million tons, which allows ensuring the livelihoods of 147 million people, which is three times more than the population of Ukraine. The economic impact of clean air (absorption of carbon dioxide) is about 1795 million. The total economic impact of forest and wetland ecosystems functioning was estimated at 1880 million. Annual economic impact of forest ecosystems is $150, and wetlands is 316 as per 1 ha.

The share of natural capital in the structure of Ukraine state budget was calculated to about 5 % that's 2 % – in the structure of GDP. The annual economic performance of the Ukraine forest and wetland ecosystems equals to 12 budgets of Rivne region. This indicator must be significant for preservation investment.

Estimation of biodiversity components economic efficiency is the basic tool to prove the necessary of annual fund increasing.

One of the innovative tools to attract foreign investment in Ukraine is the implementation of the Kyoto Protocol. Economic grounding allows coming to the conclusion that Ukraine forest ecosystems efficiency occupies the second place after Russia. Ukraine forest ecosystems are able to provide livelihoods to population up to 63 million people and be the second after Poland. As carbon recipient countries, Moldova and Belarus should compensate Ukraine for these effects on forest preservation. This would allow Ukraine to restructure its external debt (Table 3).

Tab. 3. **The economic reasoning of carbon dioxide absorption of neighboring countries forest ecosystems and population livelihood**

№	Country	Economic efficiency million, USD		Population, thousand		
					including	
		Total	1 ha	Total	population whose livelihoods provided by oxygen due to forest	% total population
1.	Belarus	10,2	0,5	10367	629,3	6,1
2.	Moldova	3,7	1,1	4358	225,4	5,2
3.	Poland	1740	55,7	38418	107142,9	278,9
4.	Russia	177300	79,1	7911000	10917487,7	138,0

5.	Romania	1340	56,2	22820	82512,3	361,6
6.	Slovakia and the Czech Republic	920	71,9	15645	56650,2	362,1
7.	Hungary	320	34,4	10335	19704,4	190,7
8.	Ukraine	1880	31,1	48457	115766,0	238,9

Source: own elaboration

This comparison showed that the forest and wetland ecosystems efficiency in more than 9 times higher (research – in 5572 times, nature reserves – in 226 times, in more than 1000 time in national ecological networks) than the total budgetary investment in environmental protection in 2009. This is a definite argument for fund increasing.

Conclusions

1) Biodiversity should receive adequate economic assessment to reflect the GDP as national wealth. According to calculations economic evaluation of Ukraine forests and wetlands functioning is more than 1.88 billion. United States (2 % of GDP and 5 % of the State Budget of Ukraine 2009 level; 3 % of the State Budget of Ukraine 2013 level). The economic account of these functions of biodiversity in GDP will allow to form in Ukraine the market of ecosystem services and to attract foreign investments for nature protection activity realization.

2) Display of biodiversity cost-effectiveness in the state national accounts and ecosystem services will allow restructuring Ukraine's foreign debt (104 billion dollars.) over 15-20 years.

3) It is necessary to support functioning of forest and swamp arrays of Ukraine in the natural state. Occupying only 19,1 % territories of the state one hectare of swamps brings profit for society in a size over 316 dollars, forest – 150 dollars (does not take into account collection of by-products and medical plants).

4) Analysis of the actual annual funding revealed the discrepancy between the real ecosystems value (value or productivity) and public investment for their maintenance. The economic impact of ecosystems at least 9.4 times. greater than the total annual state budget investment in nature conservation. The costs of biodiversity should be allocated by a separate line in the state budget.

5) The total economic value concept in terms of the direct and indirect functions of the biodiversity components is the most appropriate for the

economic evaluation. Methods of economic evaluation of biodiversity by law developed by this research should be introduced. This will take account of biodiversity functions such as: wetlands water purification functions, forests and swamps oxygen production, health effects of recreational activities. The economic record of biodiversity functions in GDP will generate ecosystem services market in Ukraine and attract foreign investment into the environmental activities implementation.

6) Implementation of the Kyoto Protocol is a real opportunity for Ukraine to receive funding of $ 7.5 billion for internal environmental policy and the health of the population. Moldova and Belarus, as recipient countries emissions under the Kyoto Protocol should compensate Ukraine the forest ecosystems maintenance and invest into their development.

7) It is necessary to maintain swamps ecosystems in their natural state. It is an important function of wetland ecosystem to be a natural water filter. As society even doesn't assume that due to swamps it annually saves $ 85 million on water treatment plants installation. Moreover, it is impossible to consider all environmental economic and social functions of forest and wetland ecosystems, especially in fish recreation, sport hunting, leisure, recreation, gathering medicinal plants and by-products, etc. This is a powerful argument in the reflection environmental and socio-economic value of forest and wetland ecosystems functioning in the national state accounts confirmed by the developed countries experience.

8) Operation of forest and wetland ecosystems annually provides livelihoods of such number of people that were three times greater than its own population of Ukraine (147 million people). It has great social value that cannot be expressed by any valuation and calculations.

9) Economic efficiency calculation of the biodiversity components is the basic tool of evidence necessary to increase in annual funding.

10) Biodiversity preservation in Ukraine has a complex hierarchical structure of government and is characterized by some non-systematic, unclear division of roles and responsibilities. Only 4% of the total number of regions of Ukraine the function of biodiversity preservation is reflected in the organizational structure of state environment authority. The largest share (56%) belongs to regions with combined functions of state administration in the field of biodiversity conservation. All this requires further scientific study and improvement of organizational management structure preserving biodiversity in Ukraine.

11) In order to improve management of biodiversity preservation we will use Poland experience, concerning the taxation of land preservation, involvement of local authorities (communes) to address issues of biodiversity preservation management at the community and state authorized territory.

The system of efficiency management estimation of the NPF has been improved. Rational System of Management Natural Reserved Fund will be created due to:

- effective management;
- financing of state and local budgets (substantiation of expense standards);
- selling of literature on Natural Reserved Fund (publishing of booklets, tourism);
- to extend of network of privileges (tax on land);
- improvement of mechanism of economical insurance of Reserved Territories;
- involving of all categories of Natural Reserved Fund into the sphere of market;
- working out of management plans for Regional Landscape Park.

The management structure for regional landscape parks has been developed. The natural capital index (NCI) of natural preserves and national natural parks of the NRU has been carried out. The optimization economic model of financing calculation of nature protections objects' activity has been developed.

The conservation, enhancement and sustainable use of the diversity of organisms, ecosystems, landscapes, as strategic principles of the development of the world community in the XXI Century, became the essence of state environmental policy in Ukraine. Defending the constitutional rights of Ukrainian citizens for having a high-quality environment, the President of Ukraine, has signed 30 Decrees since 1994 resulted in the considerable extension of the network of protected areas.

Creation of Natural Reserved Fund territories is means of successful preserving of natural richness of our state. It is necessary to extend the preserved network, to save rare kinds of plants and animals. Nowadays, as never before, D. Darrel`s words are very important and actual: "Remember! Plants and animals haven`t got deputies, they can`t write and complain to anybody, nobody can defend for them, except us, people, which together with them are inhabitants of this planet".

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