Improving the Mechanism of Taxation Within State Environmental Policies

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Abstract The paper focuses on the problems of environmental accounting and taxation in the interests of environmental accounting in Russia. It examines the essence of environmental taxes and payments, their various types and functions, their application in Western countries, the stimulating effect on the economy and business entities, and their significance for the environment. The paper also discusses the concept of environmental taxation and the economic essence of resource rental taxation, the tools used for the extraction of natural rent used in developed countries, and the mechanism for the extraction of natural rent in force in the Russian Federation. The paper proposes and substantiates a new methodology for calculating environmental payments.

Keywords Environmental accounting · Environmental taxation system · Environmental protection · Environmental management · Resource rental taxation · Environmental taxes and payments

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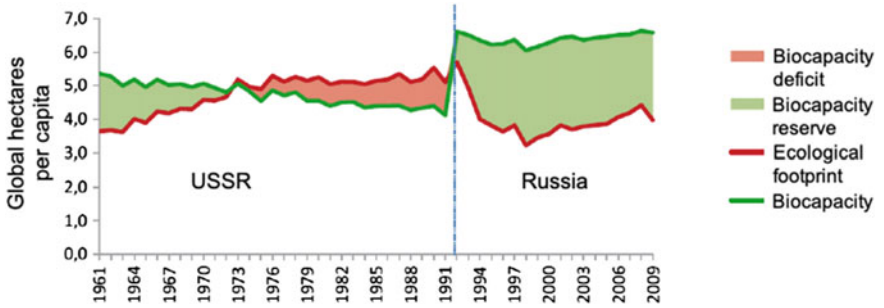

Fig. 1 The dynamics of biological capacity and ecological footprint in the USSR and Russia in 1961–2009 *Source* (McLellan et al. [3])

1 Introduction

The concept of sustainable development [SD] was developed and implemented in 1992 at the United Nations Conference on Environmental Development in Brazil. The paradigm of the concept of sustainable development, often called the World Model of the Future Civilization, considers the achievement of a balance between such areas of human development as social, economic, and environmental. The concept takes into account the needs of our time so that the similar capabilities of future generations are not compromised. In other words, SD assumes economic growth, which does not lead to environmental damage and is accompanied by the solution of social issues [1].

With all the wealth of natural resources, Russia holds the first position in the world in terms of negative environmental impact (per one person). Thus, environmental protection and conservation of natural resource potential are critical for Russia [2]. In many areas, after the accident at the Chernobyl nuclear power plant, pollution zones of up to 55.1 thousand square meters were formed. An extremely unfavorable situation developed in the Ural region. The state of land territories is constantly deteriorating, their degradation and desertification occur. Figure 1 shows the dynamics of biological capacity and ecological footprint in the USSR and Russia from 1961 to 2009.

Nowadays, it is more profitable for companies to pay fines for pollution than to implement measures to protect the environment. Therefore, it is necessary to improve the environmental tax mechanism. In this case, one cannot ignore the accumulated world experience [4]. The primary objective of the introduced measures should be the promotion of environmental management.

2 Environmental Accounting in Russia

In Russian practice, environmental accounting is a relatively new direction of accounting, and its methodological and theoretical provisions were not yet fully

Table 1 EPA environmental accounting system

Type of environmental accounting	Accounting object	Addressee
National income	Population	External
Financial accounting	Company	External
Management accounting	Enterprise, department, service channel, production line or system	Internal

Source[10]

developed. Some researchers consider it as some mechanism for working with information on environmental expenditures and the results of environmental activities to manage the enterprise [5]. Other authors consider it an integral part of accounting, which contributes to the display in the documents of the financial report of complete and reliable information about the environmental activities of a company [6]. In their opinion, environmental accounting is a methodology for reporting systematic information on environmental activities carried out following legislatively established requirements [7]. Despite the variety of definitions of environmental accounting, all authors agree that it should provide information on the enterprise's activities related to environmental protection, providing effective control over these activities [8].

In general, environmental accounting can be understood as the compilation of formal and documented systematic information on environmental activities in accordance with the legal requirements for accounting information and the preparation of integrated reporting. It includes the following elements [9]:

- costs of environmental protection measures;
- financial obligations in the field of ecology;
- reporting on nature conservation activities;
- organization and conduct of environmental audits (Table 1).

Environmental accounting, along with environmental payments, is the essential tool for implementing the concept of sustainable development and environmental safety [11, 12], which allows us to approach international standards of financial and management accounting, which ultimately contributes to the sustainable development of the country [13].

Sustainable development is such economic and social transformation when the exploitation of natural resources, investments, scientific and technological progress, and major institutional changes are coordinated.

Let us note that for Russia, which is in different macroeconomic conditions than the developed countries of the West, it is necessary to implement programs to increase GDP. However, GDP growth does not always correlate positively with socio-ecological and economic development indicators, which include improving the environmental situation, reducing inequality between social groups, and developing scientific and educational programs [14].

At the present stage of human civilization development, most developed countries are marked with an increase in welfare, if it is understood as an increase in GDP.

3 Environmental Taxes and Payments

Environmental taxes are present in all economically developed countries. They were first introduced in 1973 in the text of the First European Union Environmental Action Program. It was then that the "polluter pays" principle was first formulated. According to this principle, an entity bearing formal responsibility for environmental pollution is obliged to compensate the state for the damage. In other words, environmental taxes are an indirect method of economic regulation of the impact that taxpayer have on nature [15].

Arthur Cecil Pigou formulated the concept that "the amount of tax should cover the losses of society." A tax satisfying these requirements is often called the "Pigouvian tax," after this prominent English economist of the twentieth century [16].

The idea of "double dividend" is included in the environmental tax, which implies that the introduction of environmental taxes improves the environment, particularly in reducing pollution by environmental enterprises. On the other hand, it allows the state to reduce labor and capital taxes [17].

For countries with a high share of the commodity sector in the economy, a resource-rent taxation is an essential tool used to build a system of using natural resources through the fiscal mechanism [18, 19].

4 Resource Rental Taxation

Resource (natural, environmental) rent represents a superprofit. Unit costs include the cost of invested capital, labor, materials, and energy needed to turn a resource into a commodity. After deducting the cost of these factors of production from the value of the goods, there remains the actual cost of the natural resources (land, water, minerals, marine biological resources, forests, and such resources as clean air and water) (Friedmann [20]). Mountain and land are types of natural rent. Mountain rent, in turn, is divided into minerals, gas, and oil. Land rent is classically divided into water, forest, agricultural, and other types of rent.

Natural resource rent can arise due to such a factor as limited deposits of natural resources, which allows companies to use such resources to become monopolists. Such rent is called "absolute rent." A different type of rent is differential rent. It arises from the "objective difference in surplus production from different subjects of exploitation of natural resources" [21]. In Russia, the concept of rent is not legislated. A portion of rental income is seized through taxation of natural resources [22].

The current tax system in Russia does not stimulate business in terms of innovative programs aimed at protecting the environment. It is often cheaper for enterprises to pay a fine, for example, for water pollution, than to bear the costs of wastewater treatment. It makes sense to introduce a new industrial and environmental tax that stimulates the rational use of natural resources by enterprises [23].

5 The Proposed Methods of Calculation of Industrial and Environmental Tax

The environmental damage assessment proposed below is based on identifying the number of environmental pollutant emissions that occurred during production. To stimulate business entities, a rent coefficient is involved in all calculations, which is established depending on the size of quotas for the extraction of hydrocarbon raw materials and other natural resources, because the amount of harmful effects on the environment directly depends on the volumes of extraction of natural resources. It should be clarified that we proposed to buy mining rights due to their limited nature. However, since subsoil users pay mineral extraction tax and payments for subsoil use, it makes sense to introduce tax benefits. Moreover, it is possible to envisage the possibility of tax holidays for the enterprise for the installation and launch of large-scale treatment facilities or the implementation of large-scale projects related to environmental protection [24].

Let us note that for payment for the negative environmental impact that was currently introduced, periodic indexation is provided due to inflation. However, many experts believe that it does not take into account the real inflation. In agreeing with this opinion, within the framework of the proposed measures, it is advisable to introduce a deflator coefficient for environmental payments that considers the real inflation rate [25].

Given the above, the environmental tax formula is as follows (1):

$$\prod = \sum_{i=1}^{n} (V_{pol} - V_{uti}) \times K_{inc} \times K_{def} \times R_{pli}, \tag{1}$$

where

V_{pol} the volume of pollution created by the company;
V_{uti} the volume of utilized or liquidated contaminants;
K_{inc} the increasing coefficient;
K_{def} the deflator installed by the Ministry of Economic Development of the Russian Federation;
R_{pli} the rate of charge for emission or discharge of the i^{th} pollutant.

The increasing coefficient is proposed to be obtained by the following formula (2):

$$K_{inc} = \frac{V_{prof}}{V_{inv}} \times k_{rent}, \tag{2}$$

where

V_{prof} the net profit of the company;
V_{inv} the corporate investment in environmental activities;

k_{rent} the coefficient proportionally related to the number of rights of a company to extract minerals.

The increasing coefficient regulates the relationship between the company's revenues after deducting all operating expenses and funds to improve the environmental situation. In connection with the proportional volume of production, by increasing the negative impact on the environment, it is proposed to introduce a rent coefficient. The proposed approach to calculating the amount of environmental tax, taking into account the rental component, is based on the introduction of rental payments. Payments from rents should be sent to specially created environmental funds in the Russian regions, which will be targeted for implementing various environmental programs aimed at improving the environment, reproduction of renewable natural resources, construction of treatment facilities, and research in the field of ecology [9].

Let us now calculate the amount of the environmental tax for several major air pollutants from stationary sources for pollution and other negative impacts on the environment following the current legislation and the method we set out.

The primary air pollutants reported in the 2016 report are methane, nitric oxide, carbon monoxide, and sulfur dioxide. Information on the structure of "Gazproms" PJSC emissions into the air for 2016 is presented in Table 2.

Let us calculate the payment for the negative impact on the environment according to the formula (3):

$$P_{ni} = \sum_{i=1}^{n} M_{ni} \times R_{chi} \times R_t \times R_{ni}, \tag{3}$$

where

M_{ni} the payment base for emissions or discharges;

R_{chi} the charge rate for the emission or discharge of the i^{th} pollutant following the decree "On rates of fees for negative impact on the environment and additional ratios" (September 13, 2016 No. 913) (Government of the Russia Federation [26], rubles/ton (rubles/cubic meter);

R_t an additional coefficient to payment rates related to territories and objects under special protection following federal laws [27], equal to 2;

Table 2 The data on pollutants of "Gazprom" PJSC for 2016

No.	Pollutant	The volume of pollution produced, thousand tons	Cleaned off gas
1	Hydrocarbons (including methane)	1,462.35	1,374.61
2	Nitric oxide	550.48	519.07
3	Carbon monoxide	288.46	270.43
4	Sulfur dioxide	346.09	324.46

Source ("Environmental Report" 2016)

R_{ni} the coefficient to the rates of payment for emission or discharge of the ith pollutant for the volume or mass of emissions of pollutants, discharges of pollutants within the limits of standards for permissible emissions, standards for permissible discharges, equal to 1 [28]

After carrying out all the calculations according to the formula, we revealed that, according to the available data, the environmental tax should be 13,423.61 rubles.

Let us calculate the environmental tax according to the model recommended and proposed by us. We take the rental coefficient for 5% of every 10 million tons of quotas for mining. For the source data, the coefficient will be:

- 20% for 420.1 billion m^3 of gas.
- 20% for 47.2 million tons of oil.

The final coefficient for this data will be 40% as the sum of each type of resource's coefficients.

Then k_{rent} equals to:

$$k_{rent} = \frac{209,725\,million\,rubles}{34,103.25\,million\,rubles} \times 1.4 = 8.6$$

The deflator coefficient is equated to the mathematical expectation of the coefficients set by the Ministry of Economic Development of the Russian Federation. Then, it will be 1.4.

Based on the initial data, we calculate the base volume of negative environmental impact on the primary pollutants into the air from stationary sources.

$V_{\text{hydrocarbon, including methane}} = 114{,}090.07$ rubles;
$V_{\text{nitric oxide}} = 35{,}359.49$ rubles;
$V_{\text{carbon monoxide}} = 6{,}262.79$ rubles;
$V_{\text{sulfur dioxide}} = 11{,}823.30$ rubles.

After all calculations according to the formula, we found that, according to available data, the environmental tax should be 167,535.65 rubles.

6 Conclusion

The environmental tax calculated by the new methodology is fairer and allows us to receive a significant amount of funds for environmental needs. As previously stated, the current environmental payment has no incentive and regulatory impact. In contrast to the current payment, the proposed tax is an incentive in that companies must either extract fewer natural resources or reduce emissions by introducing treatment facilities to lower the environmental tax. The tax also contributes to the accumulation of funds received in environmental funds and stimulating investment in environmental protection.

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