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FINANCIAL MECHANISMS FOR REGULATION OF ENVIRONMENTAL SAFETY IN UKRAINE

Larysa Nekrasenko

Poltava State Agrarian Academy, Poltava, Ukraine

Dependence on fossil energy sources, high fuel prices and poor environment require a revision of energy policy in Ukraine [1]. In addition, the burning of fossil fuels is the main cause of air pollution. The main natural agents to reduce the impact are coniferous forests, which absorb and accumulate carbon dioxide. But unfortunately, more than 100 years of forest management due to consumer approach has led to decrease by 40% the total forest area of the Ukraine. Ministry of Forestry of Ukraine was established only in 1966, its main task was to restore the forests. The forest cover increased by 1.5 times for 50 years and to date is 16% of Ukraine [2].

To achieve ecological balance should be increased the absorption of CO₂ through reforestation pine forests. Also, to achieve a balance between emission and absorption should involve instruments, including financial that would make unprofitable and unpopular high energy and carbon capacity of the economy. These tools are taxes calculated on the basis of fairness, objectivity and scientific.

For example, can be improved environmental tax [3]. It should include a higher carbon tax, tax for crop rotation, manure tax (on livestock), forest enterprises tax (tax on cutting of trees).

The choice of the tax base is a responsible task because insufficiently substantiated tax base may cause doubts about the fairness of the tax and its economic feasibility. Moreover, the decision as to what should be the tax base is uncertain, particularly when there is uncertainty about the properties and the environmental impact of industrial use of various natural resources and consumption of products with externality [4].

Introduction of a tax on crop rotation, which makes the allocation instead of carbon absorption, promote change priorities in the selection of crops and reducing carbon emissions. The tax rate should be based on exceeding the permissible area of high-carbon crops.

We have studied the relation between the yield of various crops and absorption or excretion of CO₂. We hypothesized: there is some connection between the yield of various crops and the balance of absorption

/ excretion of CO₂. We explored this relationship. According to our research was developed an econometric model of the dependence of absorption / excretion of CO₂ harvest different crops.

To investigate the factors that most affect the excretion and absorption of carbon by plants we resorted to the correlation analysis. Analysis of the correlation matrix of indicators showed that the ability to release carbon plants are remains different and have both direct and indirect relationship with the studied factors (harvest various agricultural cultures for years). We used multiple regression analysis to examine the impact of all factors to determine which ones have the most impact.

We have created a regression model:

$$Y_x = 0.57x_1 - 1.04x_2 - 33.93x_3 + 38.71x_4 + 32.88x_5 + 3.05x_6 + 12.77x_7 + 6.59x_8 - 1.11x_9 - 143485$$

| | | |
|--|----------------|-----------|
| Land Use, Land-Use Change and Forestry, Cropland | Y | -143485 |
| Grain and leguminous crops | x ₁ | 0,5728949 |
| Sugar beet (factory) | x ₂ | -1,03598 |
| Oil crops | x ₃ | -33,92927 |
| Sunflower | x ₄ | 38,710469 |
| Rape | X ₅ | 32,884556 |
| Potatoes | X ₆ | 3,0536347 |
| Vegetables | X ₇ | 12,769011 |
| Feed root crops | X ₈ | 6,5923682 |
| Maize for silage, green feed | X ₉ | -1,112174 |

Over the period since 1990 was not observed stability in carbon dioxide sequestration in cropland. Was noted the prevalence over the excretion of CO₂ above absorption of CO₂. According to the results of the correlation analysis, we found that the greatest positive impact on the change in the allocation of CO₂ have sunflower, rape and vegetables. The strongest feedback (ie, increase absorption and reduce selection) have oil crops, sugar beet and maize for silage.

Over the period sharply declined growing the fodder and silage crops and sugar beets. Obviously this is due to the fall of livestock cattle. Livestock farms are a source of methane emissions. Therefore it is necessary to encourage farmers and farm to use biogas settings. Due to the tax manure can activate the innovative activity of farmers to use biogas

plants. The tax base should be livestock. If using biogas settings the tax will not be charged and will be available preferential credit for the innovative development of clean energy technologies.

Another reason for the decline in absorption is a decrease in forest areas that have been destroyed in the last century. So far, the state of the forest industry does not meet the needs for reforestation.

As for deforestation and reforestation in Ukraine are forestry - they have to feel the depth of responsibility for the preservation and restoration of forests. In order to fix the current state forestry have to pay tax for cut forest area. Tax cuts can be made in the case that forestry will plant forest that will not cut. The areas of this forest have to compensate the cutting down forest or destroyed forest due to other causes. This tax rate should be progressive, depending on the area of cutting and high enough to motivate forestry in its decrease.

Another factor that must be considered is the complexity of measuring the tax base. To formation of an economically and environmentally efficient and fair tax system can be used adjustment factors to the tax rate. Carbon Footprint could be use as an adjustment factors and as measure of environmental damages. We propose to consider the carbon footprint in terms of environmental damage by O. Balatsky (O. Balatsky, 1979) [5]. We propose to calculate the damage as the ratio of the carbon emission and uptake capacity of forest per year. We believe it is enough to know carbon dioxide emissions, forest area and volume absorption for calculate the environmental damage from carbon dioxide.

We offer to increase the carbon tax by reducing Value Added Tax. We also propose to use differential tax rate in the regions. The difference will be in the degree of damage to the environment and the possibility of its compensation.

Thus, the problem of environmental management can be solved by balanced and scientifically-based approach to the development and implementation of environmental taxes to ensure energy and environmental safety.

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