AN ECONOMETRIC ANALYSIS OF THE ENVIRONMENTAL PROTECTION EXPENDITURE EVOLUTION IN ROMANIA

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Abstract
In the context of sustainable development, environmental policy plays a fundamental role, being one of the major challenges within the EU. In this European framework, and beyond, the objectives of Romania's sustainable economic development policy include among the priority objectives the intensification of environmental protection actions. Starting from these aspects, the paper analyzes the evolution of environmental protection expenditures by producer and environmental categories. In the analyzed period, total expenditure has been on an upward trend. A first regression occurred during the economic crisis, after which the allocated funds increased, but a new decline began in 2012. To highlight developments in these expenditures, they were analyzed by the main categories of producers (Unspecialized Producers, Specialized Producers, and Public Administration) and fields (Air, Water, Waste, Soil and underground water, Noise and vibration, Natural resources and biodiversity).

Key words: *econometric modeling, environmental protection expenditure, sustainability, producer category, environmental domains.*

JEL Classification: *C20,F18,O13,O44*

I. INTRODUCTION

The quality of the environment is considered one of the nation's priority objectives. Nowadays, sustainable development is increasingly important for the economic growth of each country, so there must be compatibility between it and the improvement of the environment. This compatibility must depend, on the one hand, on the choice of the most appropriate objectives and, on the other hand, on the careful design of the regulatory programs [Schmalensee, 1993; Rahman et al., 2017].

Under the conditions of sustainable development, the relationship between development and expenditure on environmental protection must be an appropriate link, all the more so, as sometimes an increase in spending on protection may not have the desired ecological effect [Mesjasz-Lech, 2017]. Under these conditions, all decision-makers must target investments for environmental protection and the financing of activities and actions for the prevention, reduction and elimination of pollution [Popeanga & Holt, 2014: Vogel, 1997], by identifying criteria for allocation of competences at different levels of government [Fiorillo & Sacchi, 2012]. The relations of equilibrium of the environmental and tax expenditures of the public sector at the local level are reflected in the environmental policies that have to be oriented towards sustainable economic development [Ring, 2002; Soukopová, 2013].

A clearer picture on the evolution and trends of environmental protection spending in Romania may result from their analysis by categories of producers [Mitran, 2016] (Unspecialized Producers, Specialized Producers, and Public Administration), as well as environmental areas (Air, Water , Waste, Soil and underground water, Noise and vibration, Natural resources and biodiversity), as well as the programs started in this respect [Barbu, 2018].

The main objective of this paper is the analysis of the evolution of environmental protection expenditure in Romania, during the period 2005-2018, by applying quantitative methods based on the use of structural, evolutionary indicators [Balăcescu & Tănăsoiu, 2009] and linear regression models [Andrei et al. 2013], the aspects presented being the results of the continuation of the research undertaken in 2017 regarding the analysis of the environmental protection expenditure in Romania from 2005-2015 based on the new series of data that characterize the period 2015-2018.

II. METHODOLOGY AND DATA

Expenditure on environmental protection has as its main components the expenses incurred for carrying out surveillance and environmental protection activities, including the prevention or repair of damages to the environment. Specific environmental protection activities include, first of all, the prevention and combating of pollution, then the protection of natural resources and the preservation of biodiversity, as well as other additional activities necessary for the protection of the environment. Thus, the analysis is based on the available information on environmental protection expenditures by producer groups and environmental domains, for the period 2005-2018 [NIS, 2018]. The abbreviations and meanings of the variables used in the analysis are shown in Table 1.

Table 1. Significances of variables included in the analysis

VARIABLES	SIGNIFICANCES	UNITS
TEPE	Total environmental protection expenditures	RON billion / year
EPEUP	Environmental protection expenditures incurred by unspecialized producers	RON billion / year
EPESP	Environmental protection expenditures incurred by specialized Producers	RON billion / year
EPEPA	Environmental protection expenditures incurred by public administration	RON billion / year
AIR	Air	RON billion / year
WAT	Water	RON billion / year
WAS	Waste	RON billion / year
SUW	Soil and underground water	RON billion / year
NV	Noise and vibrations	RON billion / year
NRB	Natural resources and biodiversity	RON billion / year
OD	Other domains	RON billion / year

Source: Authors elaboration

Variable values have formed chronological series, such as:

$$\begin{Bmatrix} 1 & 2 & 3 & \dots(t-1) & t & (t+1)\dots(n-1) & n \\ y_1 & y_2 & y_3 \;\cdots & y_{t-1} & y_t & y_{t+1} \;\cdots\; y_{n-1} & y_n \end{Bmatrix} \tag{1}$$

Evolution trends of the variables included in the analysis are evidenced by the application of the chronological series indicators: average level, average growth, average index, average rate. At the same time, the determination of the most realistic tendencies is necessary for the elaboration of adequate strategies regarding the efficiency of the environmental expenditures, which required the application of a time regression model, by the form:

$$Y(t) = a + \sum_{k=1}^{m} b_k \cdot t^k + \varepsilon, \quad t = \overline{1,n} \tag{2}$$

In model (2), Y represents the resultant variable, in particular it can be any of the variables edited in table 1, $a, b_k \in R,\ k = \overline{1,m}$ are the parameters of the model, and m is its order. For the test and verification of the statistical significations of the obtained results, the statistical tests F and t (Student) for 95% confidence level were used (α=0.05). Data processing was performed using SPSS.

III. RESULTS AND DISCUSSIONS.

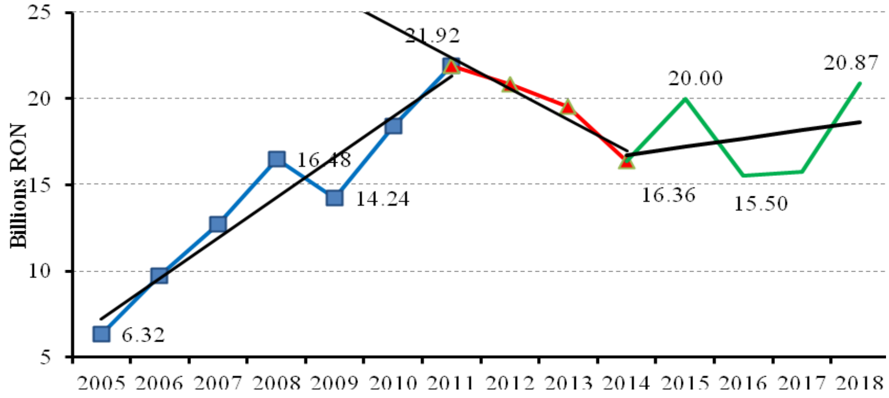
Taking into account that the subject of environmental protection is of major public interest, the principles and strategic elements developed must lead to sustainable development. In this context, in order to clarify the manner in which environmental protection expenditures were incurred, they were addressed and analyzed by three categories of producers (UP, SP, and PA). At the same time, they were also considered their classification in environmental fields (AIR, WAT, WAS, SUW, NV, NRB).

IV. AN OVERVIEW.

During the period 2005-2015, the environmental protection expenditures registered an alternate evolution with successive increases and decreases (Figure 1). With the exception of a decline in 2009, a decline that could be considered a consequence of the economic and financial crisis from 2018, the total environmental protection expenditures between 2005 and 2011 recorded a significant increase, from RON 6.32 billion in 2005 to RON 21.92 billion in 2011 (an increase of 3.47 times). Except for 2009, the increase was linear, the characteristics of the regression model being presented in Table 2.

Taking into account Sig.F and P-value values much lower than the significance threshold (α = 0.05), the model is statistically significant. The coefficients of the model as well as the confidence intervals limits for a confidence level of 95% can be considered that the environmental protection expenditures developments in this period increased linearly with an annual value of RON 1,571 billion and RON 3,202 billion, the most likely increase being RON 2,346 billion / year.

Figure 1. Evolution of environmental protection expenditures during 2005-2018



Source: Authors elaboration

The model is:

$$TEPE(t) = 4.875 + 2.346 \cdot t + \varepsilon, \quad t_{2005} = 1 \tag{3}$$

Table 2. Characteristics of the regression model corresponding to the evolution of environmental protection expenditures during 2005 – 2011

Multiple R	R Square	*F*	*Sig. F*	*Coefficients*		*t Stat*	*P-value*	*95% Conf. level*	
								Lower	*Upper*
0.9614	0.9238	60.61	0.0005	a	4.875	3.62	0.0152	1.412	8.339
				b	2.346	7.78	0.0005	1.571	3.120

Source: Authors elaboration

The increase period recorded in 2005-2011 was followed by a period of decreasing environmental protection expenditures. Thus, between 2011 and 2014, the value of environmental protection expenditures decreased from ROL 21.92 billion in 2011 to ROL 16.36 billion (a 25.36% reduction). Decrease recorded is also linear, the characteristics of the evolution are presented in Table 3.

Table 3. Characteristics of the regression model corresponding to the evolution of environmental protection expenditures during 2011 – 2014

Multiple R	R Square	*F*	*Sig. F*	*Coefficients*		*t Stat*	*P-value*	*95% Conf. level*	
								Lower	*Upper*
0.9651	0.9314	27.17	0.0348	a	24.162	25.51	0.0153	20.088	28.236
				b	-1.802	-5.21	0.0348	-3.289	-0.315

Source: Authors elaboration

The model of 2011-2014 period is:

$$TEPE(t) = 24.162 - 1.802 \cdot t + \varepsilon, \quad t_{2011} = 1 \tag{4}$$

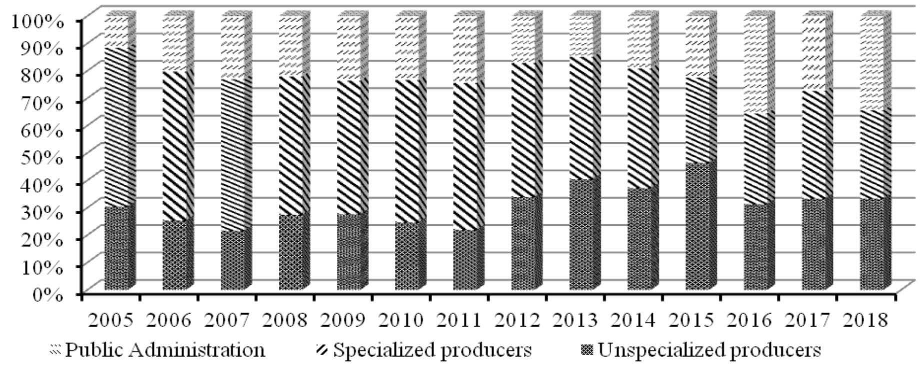
The environmental protection expenditures in the period 2011 – 2014 decreased linearly with an annual value of RON 3.289 billion and RON 0.315 billion, the most likely increase being RON 1.802 billion / year.

After 2014, the evolution of environmental protection expenditures alternates with a relatively upward trend with a slope of 0.4787 trillion lei per year, the value of these expenditures reaching in 2018 to 20.87 trillion lei, with 4.51 trillion more than in 2014 (a increase by 27.57%).

V. ENVIRONMENTAL PROTECTION EXPENDITURE BY CATEGORIES OF PRODUCERS

Analyzing the structural evolution of the expenditures on environmental protection by categories of producers, in the period 2005-2018, it results that the largest share is for SP category of 58.09% and the minimum for PA for 11.57%. Both extreme percentages are recorded at the level of 2005. The comparative analysis of the weights of environmental expenditures of the three types of producers (Figure 2) shows three periods with relatively different characteristics.

Figure 2. The structure of environmental expenditures by categories of producers during 2005-2018



Source: Authors elaboration

A first period, between 2005-2011, is characterized by the fact that, except for 2009, the specialized producers covered over 50% of the total expenses for environmental protection. The contributions of the other producer actors ranged around 27% in the case of non-specialized producers, respectively 22% in the case of public administrations. The exception is the year 2011, when the ratios are reversed, the share of the expenses of the unspecified producers reaches 21.85%, and that of the public administrations reaches the value of 24.48%.

A second period, between 2012-2015, is characterized by the significant increase in the share of expenditures of non-specialized producers in the total expenditure for environmental protection. Thus, if in 2011 the share of their expenses was only 21.85% (the lowest in comparison with the others), in 2015, it reaches 46.31% (the highest weight compared to the shares of the other two producers). On the other hand, the share of environmental protection expenses spent by specialized producers drops significantly, from 53.67%, in 2011, to 31.15% in 2015. As regards public administrations, their contributions fluctuate around 20%.

The third period, includes the years 2016, 2017 and 2018. Except for the year 2017 when the share of the expenses for the environmental protection of the public administrations, in their total, decreases by slightly below 30%, in the other two years the contributions of the three types of producers are approximately equal, the weight of each being about 33%.

In order to analyze the characteristics and the evolution trends of the expenditures for environmental protection made by each of the three producers (Figure 3), three statistical econometric models were identified and tested, the results being presented in Table 4.

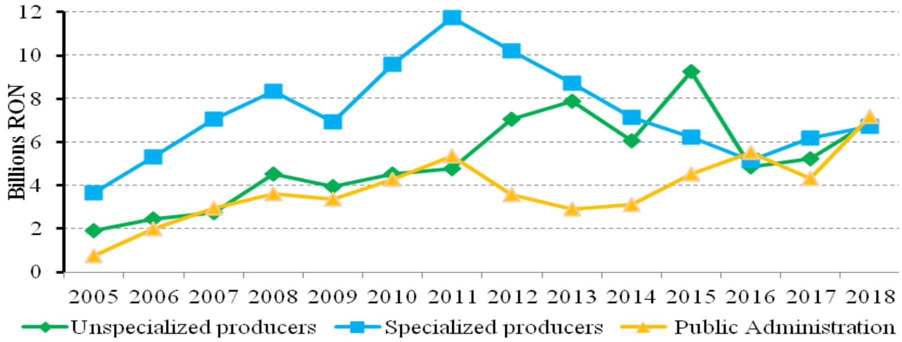
The first model (EPEUP) describes the evolution of the costs of non-specialized producers for environmental protection. This is a unifactorial linear model, of the form:

$$EPEUP(t) = 2.332 + 0.377 \cdot t + \varepsilon, \quad t_{2005} = 1 \qquad (5)$$

Taking into account the fact that, for this model Sig.F = 0.0022 $<\alpha = 0.05$ it turns out that, the null hypothesis (test F) is rejected and consequently the EPEUP model is valid (statistically significant). Also the value of the coefficient of significance ($R^2 = 0.556$) leads us to the conclusion that it offers a pretty good approximation of the evolution of the expenses with the protection of the environment of the non-specialized producers.

The results of the t-bilateral test application show that both parameters of the EPEUP regression model are statistically significant (Sig.t $<\alpha = 0.05$). Taking into account these results and the value of parameter b (the slope of the regression line), it turns out that, during the period analyzed, the expenses with environmental protection of the non-specialized producers increased on average by 377 million lei annually. We can consider that this tendency is also maintained in the immediate period if the major economic and social changes do not occur.

Figure 3. The evolution of environmental protection expenditures by producer category in 2005-2018



(Source: Authors elaboration)

The first model (EPEUP) describes the evolution of the costs of non-specialized producers for environmental protection, being a linear one-factor model, of the form:

$$EPEUP(t) = 2.332 + 0.377 \cdot t + \varepsilon, \quad t_{2005} = 1 \qquad (6)$$

Taking into account the fact that, for this model Sig.F = 0.0022 <α = 0.05, it turns out that the null hypothesis (test F) is rejected and consequently, the EPEUP model is valid (statistically significant). Also the value of the coefficient of determination (R^2 = 0.556) leads to the conclusion that it offers a pretty good approximation of the evolution of the expenses of the non-specialized producers for environment protection.

The results of the t-bilateral test application show that both parameters of the EPEUP regression model are statistically significant (Sig.t <α = 0.05). Taking into account these results, as well as the value of parameter b (the slope of the regression line), it turns out that, during the analyzed period, the expenses with the protection of the environment of the non-specialized producers increased on average by 377 million lei annually. We can consider that this tendency is also maintained in the immediate period, if the major economic and social changes do not occur.

Table 4. Indicators of regression models for characterizing the evolution of environmental protection expenditures by producer category, 2005-2018

Model	R^2	Sig. F	Regression		t	Sig. t
EPEUP	0.556	0.0022	a	2.332	2.818	0.0155
			b	0.377	3.875	0.0022
EPESP	0.724	0.0041	a	-0.364	-0.195	0.8491
			b_1	3.763	3.615	0.0050
			b_2	-0.442	-2.789	0.0190
			b_3	0.015	2.104	0.0619
EPEPA	0.581	0.0015	a	1.643	2.718	0.0186
			b	0.289	4.081	0.0015

Source: Authors elaboration

The second model (EPESP) describes the evolution of the environmental protection expenses incurred by specialized producers and is a polynomial model of order 3, of the form:

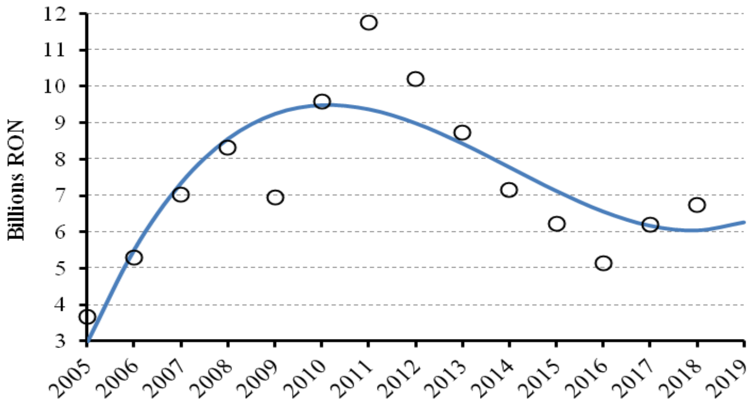
$$EPESP(t) = -0.364 + 3.673 \cdot t - 0.442 \cdot t^2 + 0.017 \cdot t^3 + \varepsilon, \quad t_{2005} = 1 \qquad (7)$$

As with the previous model, the value Sig.F = 0.0041 <α = 0.05 shows that the EPESP model is valid (statistically significant), and the value of the coefficient of determination (R^2 = 0.724) leads to the conclusion that this gives a good approximation of the evolution of environmental protection expenses incurred by specialized producers.

The results of applying the t-bilateral test lead to different conclusions regarding the statistical significance of the four parameters of the EPESP model. Thus for parameter a, Sig.f = 0.8491> α = 0.05, so accepting the null hypothesis of the t-bilateral test, it turns out that it does not differ significantly from 0. However, since this value corresponds to the moment t = 0, moment from outside the values of parameter t, it turns out that it has no effect on the model.

Regarding the other three parameters (b_k , $k=\overline{1,3}$),for two of them (b_1 and b_2) the null hypothesis of the bilateral t test (Sig.t <α = 0.05) is rejected, resulting in these being statistically significant for 95% confidence level. For parameter b_3, Sig.t = 0.0619> α = 0.05. However, considering that Sig.t = 0.0619 <α = 0.10 it turns out that its value is statistically significant for 90% confidence level.

Figure 4. The evolution of environmental protection expenditures of specialized producers in 2005-2018



In conclusion, considering the aspects presented above, we can consider that the EPESP model (Figure 4) is statistically significant for at least 90% confidence level. This model underlines the fact that, after an evolution characterized by two extreme points (a maximum in the year 2011, and a minimum around the year 2017), an upward evolution of the expenses for the protection of the environment of the specialized producers is foreseen in the next immediate period . However, this evolution is conditioned by the stability of the economic-social environment.

The third model (EPEPA) describes, like the EPEUP model, a linear and upward evolution of the expenditures for environmental protection of public administrations, being a model of the form:

$$EPEPA(t) = 1.643 + 0.289 \cdot t + \varepsilon, \quad t_{2005} = 1 \qquad (8)$$

Taking into account the fact that, for this model Sig.F = 0.0015 <α = 0.05, it turns out that the null hypothesis (test F) is rejected and consequently, the EPEUP model is valid (statistically significant). Also the value of the coefficient of determination (R2 = 0.581) leads to the conclusion that it offers a pretty good approximation of the evolution of the expenditures with the environmental protection of the public administrations.

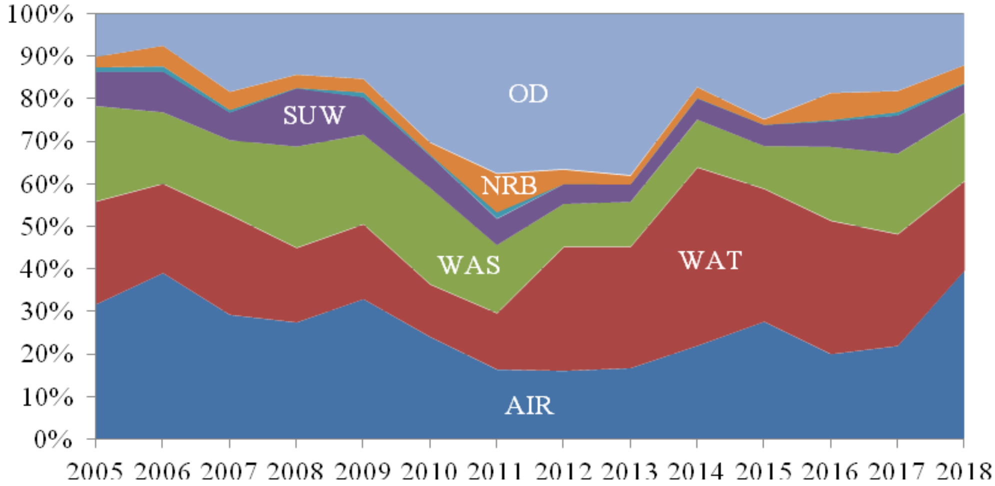
The results of applying the t-bilateral test, highlight that both parameters of the EPEAP regression model are statistically significant (Sig.t <α = 0.05), and as a result, during the period analyzed, the expenditures for environmental protection of the public administrations increased with an average of 289 million lei annually. We can consider that this tendency is also maintained in the immediate period if the major economic and social changes do not occur.

VI. ASPECTS OF ENVIRONMENTAL PROTECTION EXPENDITURE BY ENVIRONMENTAL DOMAINS

The main environmental domains of expenditure are: Air, Water, Waste, Soil and undergraund water, Noise and vibration, and Natural resources and boidiversity. During the analyzed period, in the case of Unspecialized Producers and Public Administration, with the exception of the Noise and vibration category, all other expenditure domains recorded increases.

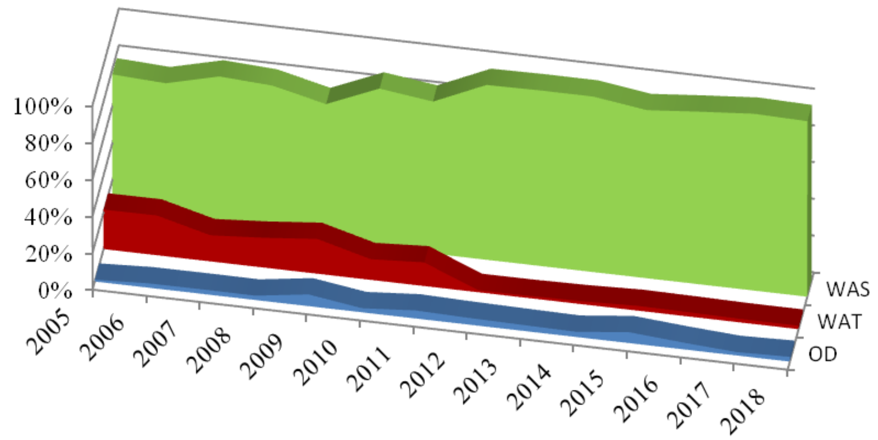
For non-specialized producers (Figure 5), during the period 2005-2018, the highest average growth rate of environmental protection expenditures was recorded for NRB domain (15.11%), followed by AIR (12.33%) and OD (11.95%). The hierarchy is completed, in descending order of average growth rates for the environmental expenditures allocated to the WAT (9.24%), SUW (8.80%) and WAS (7.62%) domains. At a significant distance of 6.18 percentage points, it is the NV domain, which corresponds to the lowest average growth rate, only 1.44%. The hierarchy is also preserved at the end of the period with some differences in the values of the lights allocated to each domain.

Figure 5. Evolutions of environmental protection expenditure by environmental domains carried out by non-specialized producers in the period 2005-2018



Although, at the end of the analyzed period, the hierarchy is preserved, some changes have occurred during it. Thus, if between 2005 and 2009 the highest expenditures for environmental protection were directed to the AIR domain, their weight ranging from 27.51%, in 2007 to 33.00% in 2009, in the period 2010-2013 the attention was mainly paid to the OD domain (in the proportions between 30.24% and 38.01%), and in the period 2014-2018 for the WAT domain, the weightings of the expenditures allocated to this domain being between 20.93% and 41.84% of the total of these expenses incurred by the non-specialized producers.

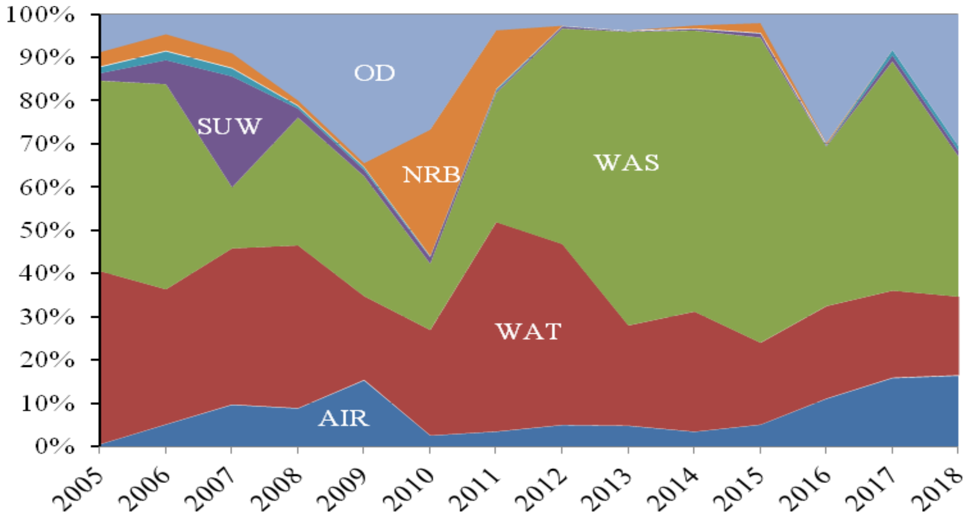
Figure 6. Evolutions of environmental protection expenditure by environmental domanins made by specialized producers in the period 2005-2018



The specialized producers (Figure 6), during the analyzed period, had in the first place the WAS domain. The percentage of expenditures allocated to this area is characterized by a slightly oscillating evolution around an increasing trend, disadvantaging the WAT domain, whose share in the total expenditures for environmental protection, drastically decreases, from 21.64% in 2006 to 1.18% in 2012. The share of environmental protection expenditures allocated by specialized producers, to the third area in question (OD), are fluctuating, without exceeding 5% of the total. For the other domains (SUW, NV, NRB) the weights are negligible (less than 1% of the total).

Waste issues (WAS) are also the focus of public administrations. These, together with the WAT domain, were in the period analyzed (Figure 7) on the first places in terms of the weight allocated to them in the total expenditure on environmental protection of public administrations. It is worth noting, however, that the expenditures related to the WAS domain have registered a significant fluctuation, their weights ranging from a minimum of 14.14% in 2007 to a maximum of 70.75% in 2015, so that the WAT domain reaches the first place in the period 2007-2008 (with 36.13% and 37.65% respectively) and in 2011 when it reaches the maximum weight of the domain (48.45%).

Figure 7. The evolutions of environmental protection expenditure by environmental domains performed by the public administrations during the period 2005-2018



Significant weights from the expenditures of public administrations for environmental protection were granted, for a short time (about a year), to the fields SUW (23.37%, in 2007), OD (34.42%, in 2009) and NRB (29.38%, in 2010). With the exception of the OD domain, whose share was higher in 2016 and 2018, the shares of the other domains in the total expenditures for environmental protection were insignificant.

Another area whose share in total expenditures has been quite low is the AIR, their values registering fluctuations between 0.44% (2005) and 16.45% (2018). Regarding the NV domain, the smallest allocations were returned to it, the share of expenditures destined being between 0.01% in 2014 and 2.03% in 2006.

VII. Conclusion

The results of the study highlight the alternative evolution (increase / decrease) of environmental protection costs by producer groups with different rhythms for each. Regarding the trends of evolution of the environmental expenditures by structural domains, there are increases for AIR in all three categories (UP, SP, AP), and for WAT, WAS, SUW, and NRB at UP and PA. On the other hand, there were reductions to the NW in all three categories of producers, as well as to WAT in the SP case.

Based on these results, we also believe that the future must include strategies that rely on identifying key factors and performance indicators to increase the level of environmental spending efficiency and information tools that support high performance management [Ştefan et al., 2010; Gogonea, 2019], in this very important area to ensure sustainable long-term development [Surmanidze, 2019; Cîrţînă & Tudorache, 2019].

The directions of action and the growth rates of the environmental protection expenditure of the three categories of producers were different. Thus, while at Unspecialized Producers the first places were the expenditures on Water and Air (average growth rates of 20.1% and 15.47%, respectively), in the case of the Public Administration, the first places were the expenditures on Air and Waste (average growth rates of 53.1% and 25.75%, respectively).We believe that the obtained results highlight the way in which the objectives of sustainable economic development policy are pursued and can be a starting point for extensive analysis of sustainable economic development strategies in Romania.

VIII. References

1. Andrei, J. V.; Ion, R.A.; Gheorghe, H.P.; Nica, E.; Zaharia, M.(2015) *Implications of agricultural bioenergy crop production and prices in changing the land use paradigm—The case of Romania*, Land Use Policy, Vol. 50, Jan. 2016, pp. 399-407.
2. Bălăcescu, A.; Tănăsoiu, G. L. (2009) *Overall analysis about the evolution of real estate market in Romania,* Annals of the University of Petroşani, Economics, 9(3), pp. 25-32.
3. Barbu, L. (2018) *Expenditure on Environmental Protection: Non-Ongoing Programs in Romania*, Revista Economica, 70, Issue 5, pp. 11-25.
4. Cîrţînă, D.; Tudorache, A. (2019) *Environmental effects due to the technological processes of lime production,* Journal of Research and Innovation for Sustainable Society (JRISS), 1, Issue 2, pp. 44-51 http://jriss.4ader.ro/pdf/2019-02/06_JRISS_2-45-52.pdf, Accessed on 2 April 2020.
5. Fiorillo, F. and Sacchi, A. (2012) *On Local Environmental Protection*, EuroEconomica, Issue 5(31), pp. 28-42.
6. Gogonea, R.M. (2019) *Water footprint for industrial products. A paradigm of concentration*, Journal of Research and Innovation for Sustainable Society (JRISS), 1, Issue 1, pp. 123-130, http://jriss.4ader.ro/pdf/2019-01/16_JRISS_1-124-131.pdf, Accessed on 2 April 2020.

7. Mesjasz-Lech, A. (2017) *Environmental Protection Expenditures and Effects of Environmental Governance of Sustainable Development in Manufacture Enterprise*, pp. 244-257 in Takács, István eds., Óbuda University, Keleti Faculty of Business and Management.
8. Mitran, D. (2016), *The Expenditures for Environment Protection in Romania*, Internal Auditing and Risk Management, 42, Issue 1, pp. 17-24.
9. NIS (2018), http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind =PMI105B. Accessed on 16 July 2018.
10. Rahman, B.; Ali, I.; Nedelea, A.M. (2017) *Greenwashing In Canadian Firms: An Assessment Of Environmental Claims*, Ecoforum, Vol. 6, Issue 2 (11).
11. Ring, I. (2002). *Ecological public functions and fiscal equalization at the local level in Germany*. Ecological Economics, 42(3), 415-427.
12. Schmalensee, R. (1993) - *The costs of environmental protection,* MIT-CEEPR 93-015WP, Massachusetts Institute of Technology; https://dspace.mit.edu/bitstream/handle /1721.1/50210/35720982.pdf?sequence=1; Accessed on 15 Jan 2020.
13. Soukopová, J., Bakoš, E. (2013). *Environmental protection expenditure: Ex–post evaluation*, Masaryk University, Faculty of Economics and Administration, Working paper WP KVE 08/2013.
14. Surmanidze N (2019) – *Green Economy*, Ecoforum Journal, Vol. 8, Issue 3(20).
15. Stefan, V.; Duica, M.; Coman, M.; Radu V. (2010) *Enterprise Performance Management with Business Intelligence Solution*, Recent Advances in Business Administration, http://repec.econ.muni.cz/mub/wpaper/working%20papers/WPKVE-08_2013 _%20Soukopova_Bakos.pdf. Accessed on 2 Sept 2018.
16. Vasile, P. and Holt, A. G., (2014) *Investment for Environmental Protection in The European Union*, Annals - Economy Series, 4, Issue , pp. 116-123.
17. Vogel, D. (1997) - *Trading up and governing across: transnational governance and environmental protection,* Journal of European Public Policy, Volume 4, - Issue 4, pp. 556-571.