

EXPENDITURES FOR THE ENVIRONMENTAL PROTECTION IN ROMANIA: RELATIONS AND CONDITIONS IN THE AGRICULTURAL PRODUCTION SYSTEM

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Abstract. *This paper aims to draw attention to one of the forms of pollution generated by the agricultural production system (with reference to soil and groundwater), simultaneously with the need to allocate funding for the expenditures necessary to control these forms of pollution (by means of investment expenditures and internal current expenditures). As a result of the markers analyzed within the data processing, one can infer that in Romania for the dynamics of the period 2008-2015, an increasing trend is displayed for the use of chemical fertilizers in agriculture, alongside a variable level of the expenditures allocated for the prevention and control of the soil and groundwater contamination (pollution). The in-depth analysis of the annual levels and the structure of the expenditures allocated for the prevention and control of the soil and groundwater contamination (pollution) was rendered synthetically by an explicit form, where the following data result: an annual variation of these expenditures, the trend being below the level of the comparison year 2008; the investment expenditures are much higher than the internal current expenditures (the limits of the annual excesses being of 121.00% and 386.41%), an annual increasing trend being remarked. Regarding the structure of the economic agents involved in these prevention activities, it resulted that by means of the ratio of the expenditures made for the prevention activities, the non-specialised producers own the highest ratio of the total (between 79.53 and 97.87% for investment expenditures and between 75.99 and 77.13% for internal current expenditures, respectively). The ones that follow are the specialized producers (with limits between 0.61 and 15.34% for investment expenditures and 11.28 and 42.75% for internal current expenditures, respectively), to which the expenditures made for the public administration are added (in regard to the total of ratios being of 0.37% and 14.70% for investment expenditures and 0.63 and 21.48% for internal current expenditures). The analysis of the levels of the expenses for the prevention and control of the soil and groundwater contamination (pollution) emphasizes/ draws attention to the increasing trend of the quantities of used chemical fertilizers, along with the variational levels, with partial annual decreasing trends, of the investment expenditures and internal current expenditures, differentiated in the structure of the economic agents.*

Keywords: fertilizers, soil pollution prevention and control expenses, prevent and fight soil pollution, producer non-specialized/skilled/public administration, annual rates increasing/decreasing, pollution long/short.

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Introduction

Environment protection is a very important issue of the present stage, when the agri-food system has imperative requirements. But the overall pollution affecting the agri-food system also affects the soil and the underground water.

This happens in an ambivalent way, as input-output: the input of possible infestation caused by the agro-technical interventions/works (especially the use of fertilizers, which affects the soil) and a preservation and transmission of the soil pollution to the agricultural products obtained.

However, the food service of the mankind requires one to know some conditional forms, especially those related to expenses.

Concerning the correlation of the main input-output elements of the pedological system, the present paper tries to highlight the level and the variation of the use of fertilizers and of the investment and current internal expenses needed in order to protect the soil in Romania.

The measurements for the time interval 2008-2015 highlight the level and the annual variations of the forms of fixed and current expenses, which reveal incongruities between the use of fertilizers↔expenses for fighting pollution.

By the discussion on the use of fertilizers, the present paper aims to identify the effects of social and economic policies upon the functionality of the agri-food system.

Materials and Methods

The data on the expenses for preventing and fighting soil pollution is centred on the interpretative forms of the level of the indexes on the use of fertilizers in Romania. For the time interval 2008-2015, the indexes were initially expressed as values and later on as percentage. The relative value was used to identify the variation compared to the year 2008, regarded as reference year, and the comparisons were continued by the structure of the investment expenses and of the current internal expenses. The comparative analyses were also deepened for the situation of the operators involved in the consumption of these expenses, which, according to CAEN Rev. 2, are classified as: non-specialised producers (carrying out activities of environment protection as second or auxiliary activities, whereas their main activity is not of environment protection), specialised producers (whose main activity consists of environment protection) and public administration (whose activities of “non-market” environment protection is performed for individual and collective consumption).

Results and Discussions

The use of fertilizers is a first-rank agri-technical measure for obtaining competitive agricultural productions. However, the excessive use of fertilizers has serious effects at social and economic level. The present paper started from these premises and analysed both the dynamics of the use of fertilizers and the structure of the investment expenses and of the current internal expenses made for preventing and fighting the pollution of soil and underground water.

I.- The dynamics of the fertilizers used in the agricultural system of Romania.

The use of fertilizers in Romanian agriculture has variational levels related to the agrarian reform that made radical changes in the structure and the way in which the soil is used. A large variety of property and household forms has emerged, and the result is that the land has split into a plethora of small plots of lands. The quantitative levels displayed in Table 1, for the dynamics of the interval 2008-2015, lead to the following remarks:

Table 1. The structure of fertilizers used in the Romanian agriculture

The structure of the fertilizer types	U. M.	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL	thousand tons (s. a.)	398	426	481	487	438	492	452	522
	% of the year 2008	100	107.03	120.85	122.36	110.05	123.61	113.56	134,19
Nitrous	thousand tons (s. a.)	280	296	306	313	290	344	303	349
	% of the year 2008	100	105.71	109.28	111.78	103.57	122.85	108.21	124,54
Phosphatic	thousand tons (s. a.)	102	100	123	126	113	114	119	131
	% of the year 2008	100	98.03	120.58	123.52	110.78	111.76	116.66	128,43
Potash	thousand tons (s. a.)	16	30	52	48	35	34	30	42
	% of the year 2008	100	187.5	325	300	218.75	212.5	187.5	262, 50

Source: *INS România, Anuarul Statistic al României, INS, 2015*

- the total amounts of fertilizers used in the Romanian agriculture has a variational pattern, with an ascending trend compared to the reference year 2008. It is worth mentioning the interval 2012-2014, which shows a decrease compared to the previous years.

- the structural analysis of the main types of fertilizers leads to the conclusion that nitrous fertilizers have the largest share, followed by the phosphatic and the potash ones. The annual growth rates are, however, different, if they are compared to the same reference year 2008. The highest growth rate is found for potash fertilizers (which are used several times more than in the reference year), followed by the phosphatic and the nitrous ones (whose growth rates are of about 0.10% ... 0.20%).

The results of the analysis of the use of fertilizers reveal the marked quantitative level, besides the qualitative aspect that refers to the annual growth trend of use, even on the agricultural properties that are small. Nevertheless, the excessive use of fertilizers always has negative effects too, especially on the soil fertilization/pollution. This is why measures of preventing and fighting pollution are needed, both long-term and short-term ones. In this context, one may make remarks on the expenses, both investment and current internal ones.

2.- Investment expenses made for preventing and fighting the pollution of soil and underground water

Investment expenses belong to the long-term measures and are one of the most important aspects of the prevention and fighting the pollution of soil and underground water. The analysis of these expenses was performed at national level, using the value quantum, as well as a valued expression of the structure of the economic agents (non-specialised, specialised and public administration).

All these problems related to the total investment expenses made for preventing and fighting the pollution of soil and of underground water are summed up in Table 2 and entailed the following conclusions:

Table 2. Overall investment expenses made for the prevention and fighting the pollution of soil and underground water in Romania

Specification	U.M.	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL out of which:	thousand lei current prices	360468	282997	333749	192899	257166	250018	220678	366781
	% of the year 2008	100	78.50	92.58	53.51	71.34	69.35	61.21	101.75
	% of the annual total (100%)	100	100	100	100	100	100	100	100
	% of the total current internal expenses	134.79	220.58	367.38	121.00	386.41	360.70	351.28	333.47
Non- specialised producers	thousand lei current prices	298215	225065	251920	159997	241702	244704	212030	348564
	% of the year 2008	100	75.47	84.47	53.65	81.04	82.05	71.09	116.88
	% of the annual total (100%)	82.73	79.53	75.48	82.94	93.99	97.87	96.08	95.03
	% of the total current internal expenses	127.74	230.84	567.51	194.81	557.84	515.28	437.59	514.06

Specialised producers	thousand lei current prices	12915	16330	51209	27879	2756	4399	1948	2243
	% of the year 2008	100	126.44	396.50	215.86	21.33	34.06	15.08	17.36
	% of the annual total (100%)	3.58	5.77	15.34	14.45	1.07	1.76	0.88	0.61
	% of the total current internal expenses	42.80	61.54	131.86	42.72	12.22	20.56	16.04	12.09
Public administration	thousand lei current prices	49338	41602	30620	5023	12708	915	6700	15974
	% of the year 2008	100	84.32	62.06	10.18	25.75	1.85	13.57	32.37
	% of the annual total (100%)	13.69	14.70	9.18	2.61	4.94	0.37	3.04	4.36
	% of the total current internal expenses	1299.05	975.19	401.73	41.77	1891.07	211.31	301.39	67.60

Source: *INS România, Anuarul Statistic al României, INS, 2015*

- the range of the overall investment expenses is, for most years, under the level of the year 2008, except for the last year of analysis. The percentage limits in the comparison against the year 2008 are between 53.51% and 92.58%. The comparison made as regards the total current internal expenses of the reference year 2008 reveals that they are three times higher;

- the non-specialised producers keep a rate that is similar to the annual dynamics of the investment expenses. It is worth mentioning that the non-specialised producers have an annual quantum that makes up a majority of the total investments (between 75.48% and 97.87%), whereas compared to the total current internal expenses the growth rates reach a level of 514.06%;

- concerning the investment expenses of the specialised producers one may note a strong annual decrease compared to the year 2008. A low level is found both for the total expenses (between 0.88 and 15.34%) and for the total current internal expenses (between 12.09 and 61.54%).

- as for the investment expenses made by the public administration and related to the pollution of soil and of public water, one may remark a descending trend (against the reference year 2008, a form that is also preserved when comparing the total in the annual dynamics). A comparison between the investment expenses made by the public administration and the total current annual expenses reveals the same high shares.

3.- Current internal expenses made for preventing and fighting the pollution of soil and underground water.

These types of expenses include the prevention and fighting of pollution and refer to the structure and evolution of the levels for which Romania has a certain specificity. The dynamics of the interval 2008-2015 is analysed starting from the annual valued levels displayed in Table 3 and leads to the following conclusions:

Table 3. Total current internal expenses made for preventing and fighting the pollution of soil and underground water in Romania

Specification	U. M.	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL out of which:	thousand lei current prices	267421	128295	90845	159410	66552	69313	62820	109987
	% of 2008	100	47.97	33.97	59.61	24.88	25.91	23.49	41.12
	% of annual total (100%)	100	100	100	100	100	100	100	100
	% of total investment expenses	74.18	45.33	27.21	82.63	25.87	27.72	28.46	29.98
Non- specialised producers	thousand lei current prices	233451	97497	44390	82126	43328	47489	48454	67805
	% of 2008	100	41.76	19.01	35.17	18.55	20.34	20.75	29.04
	% of annual total (100%)	87.30	75.99	48.86	51.52	65.10	68.51	77.13	61.65
	% of total investment expenses	78.28	43.31	17.62	51.32	17.92	19.40	22.85	19.45
Specialised producers	thousand lei current prices	30172	26532	38833	65259	22552	21391	12143	18552
	% of 2008	100	87.93	128.70	216.28	74.74	70.89	40.24	61.48
	% of annual total (100%)	11.28	20.68	42.75	40.94	33.89	30.86	19.33	16.87
	% of total investment expenses	233.61	162.47	75.83	234.07	818.28	486.26	623.35	827.10
Public administration	thousand lei current prices	3798	4266	7622	12025	672	433	2223	23630
	% of 2008	100	112.32	200.68	316.61	17.69	11.40	58.53	622.16
	% of annual total (100 %)	1.42	3.33	8.39	7.54	1.01	0.63	3.54	21.48
	% of total investment expenses	7.69	10.25	24.89	239.39	5.28	47.32	33.17	147.92

Source: INS România, Anuarul Statistic al României, INS, 2015.

- the variation levels for the total current internal expenses, compared to the year 2008, reveal a descending trend which reaches a minimal level of 23.49% of the year 2008, in the year 2014. For the same dynamics, the structural level of the total investment expenses has a descending trend whose limits are between 74.18% in the year 2008 and only 29.98% in the year 2015;

- the current internal expenses made by the non-specialised producers has the same decrease compared to the year 2008. One may notice that the non-specialised producers have the largest share of the total internal expenses (between 48.86% and 77.13%), but a significantly smaller share of the total investments made by the non-specialised producers for the same respective group (between 17.52% and 78.28%);

- the level of the total internal expenses made by the specialised producers has annual variations, which have a descending trend compared to the year 2008. Moreover, the share of these expenses in the annual total current expenses ranges between 19.33% and 42.75%, but is considerably higher in the total investments (between 75.83% and 827.10%).

- the current internal expenses made by the public administration have the lowest values and a share which fluctuate against the level of the year 2008 (between 11.40% in 2013 and 622.16% in 2015). When compared to the annual total of these expenses, the levels of the expenses made by the public administration are the lowest ones (between 1.01% and 21.48%). Significant variations are noticed for the percentage of the total investment expenses (between 5.28% and 239.39%).

To sum up, the dynamics analysed reveals a much lower level of the current internal expenses, a prevalence of these expenses for the non-specialised producers, with value levels and comparative-percentages levels marked by variations during the year.

Conclusions

The pollution of soil and of underground water caused by the use of fertilizers in Romania is a problem with serious effects on the agricultural production system. The analyses carried out during the last eight years on the comparative levels of the fertilizer quantities correlated with the expenses for the protection of the soil and the underground water lead to the following conclusions:

1.- The quantities of fertilizers used in Romanian agriculture, dynamically analysed, have an ascending trend (one may mention the existence of an annual variation, prevalent for the nitrous fertilizers).

2.- The investment expenses made for preventing and fighting the pollution of soil and underground water are prevalent overall, but they also have annual variations and descending annual trends (against the reference year 2008). Moreover, the largest share of these expenses belongs to non-specialised producers.

3.- The current internal expenses made for preventing and fighting the pollution of soil and underground water have annual levels that are significantly lower than those of the investments. The same prioritised allocation is found for non-specialised producers.

4.- The paper sums up the quantitative aspect of the use of fertilizers as well as a diminished structure of the investment expenses and of the current internal expenses made for preventing and fighting the pollution of soil and underground water. However, the increased use of fertilizers causes a damage of the soil features, especially of the fertilization ones.

Closely related to this problem emerges the necessity of taking measures of preventing and fighting both short-term and long-term pollution, with particular reference to the allocated funds. This, in its turn, requires the increase of fund allocation for preventing pollution, but also a balancing of the structure of these funds between three parts: non-specialised producers, specialised producers and public administration.

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