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EFFICIENCY AND TERRITORIAL GAPS
IN RESOURCE UTILIZATION IN CROP PRODUCTION

ABSTRACT

The use and combination of the available resources in the formation of the gross crop production in Romania in the past two decades reflects the existence of visible gaps and disparities at local level, across macro-regions and development regions respectively. The efficiency inflows in the use of production factors have had a negative effect not only on the level of value added but mainly in meeting the domestic needs and enhancing foreign trade flows. Addressing the crop production at territorial level in the past 20 years, from the perspective of resource utilization, can represent a starting point for the formulation of sectoral economic policy options, in terms of increased efficiency of resources involved in the increase in value, with direct impact on the attenuation of gaps and disparities at local level.

Key words: output, efficiency, gaps, resources.

JEL Classification: Q10, Q11.

1. INTRODUCTION

As part of total agricultural production, the crop production has an extremely important role, both from the point of view of ensuring raw products for the downstream industries and mainly for its contribution to the formation of gross value added in the agri-food sector. The utilization of available resources at territorial level and mainly their combination modality, together with other factors, have a direct influence on the level of obtained crop production, as well as on its value. Starting from these considerations, the present approach attempts to bring to the foreground the modifications produced at the level of crop production across regions in the last 22 years, from the point of view of the utilized resources.

2. STATE OF KNOWLEDGE

The resources and the production factors have been the subject of multiple studies and research works across the years, both at the level of national economy and at the level of component branches. From this perspective, the agricultural sector and its production factors and resources implicitly have represented subjects

of intense debates among specialists, the more as bringing to the foreground the most recent evolutions has represented a basis in the substantiation of some strategy studies or for attracting the necessary financial sources for development at a given moment.

In the basic research, knowing the resources and production factors and their more or less efficient allocation modality led to the construction of models and hypotheses, in their turn used, to a significant extent, for the identification of opportunities for zonal development.

The present approach adds to the already existing information base, representing a diagnosis of the last 22 years, from the perspective of the territorial allocation modality of available resources and of the results obtained in the crop production sector.

3. MATERIAL AND METHOD

In order to reveal the modality of utilization and territorial allocation of the available resources in the formation of the agricultural crop production, the present approach was based on the data supplied by the National Institute for Statistics (NIS), through the data base Tempo-Online.

For the analysis of available data, statistical methods were used, namely comparisons, dynamics and structure, the results being presented both under table form and graphical representations. It must be also specified that in the case of value indicators, these were transformed into comparable prices of the latest available statistical year, in order to avoid certain inadequate estimations of the results that incorporate inflation into nominal prices.

In order to ensure the comparability of data, in the sense of inflation influence elimination, the values were transformed into comparable prices of the latest available year (2010), in this respect the GDP deflator being used. It must be also mentioned that due to lack of data in certain cases, the time period of the analysis was expanded or narrowed.

4. RESULTS AND DISCUSSIONS

The agricultural crop production, as most of the gross value added components in agriculture, experienced an oscillating evolution in the last 22 years, both per total country but mainly across zones (at macro-regional and regional level), which were determined, among others, by the extensive character of cultivated crops, and also by the incidence of certain more or less subjective factors in the combined utilization of available resources.

4.1. Evolutions and disparities in the territorial allocation of land resources and cultivated areas in the period 1990–2011

As an essential and indispensable resource in the mechanism of agricultural crop production formation, the *agricultural area of* the country was down by 1.2% in the period 1990–2011, mainly as a result of the agricultural area diminution in macro-region III, by 3.3% respectively. The same trend is also noticed in the *arable area*, which decreased by 1% in the year 2011, the greatest decrease being noticed in macro-region I, by 3.8%.

At regional level, the most significant diminution was found in the region Bucharest-Ilfov, where, both in the case of the agricultural area and of the arable area, we can notice a significant exceeding of the national average, in negative percentages, by more than 9%. The negative trend is also maintained in the case of the other regions, with small exceptions, namely North-East and South-East regions, where the agricultural and arable areas slightly increased.

The areas cultivated with different crops had a strongly oscillating evolution in the last 22 years. Thus, except for oil crops, sunflower and rapeseed, in which the cultivated areas experienced an explosive increase, due to the diversification of their utilization, in the remaining crops the oscillations are important both per total country and at macro-regional level (Table 1).

Table 1
Modifications produced in the cultivated areas across macro-regions,
in the year 2011 compared to the year 1990 (%)

	Macroreg. I	Macroreg. II	Macroreg. III	Macroreg. IV	Total
Grain cereals	–28.1	–3.6	–2.9	–5.4	–8.4
Wheat	–48.2	–28.2	27.6	–2.9	–13.6
Rye	–80.8	–70.8	11.5	–71.1	–72.2
Barley	–89.2	–59.0	–56.3	–83.9	–69.8
Oats	–20.6	89.4	35.7	71.0	28.4
Grain maize	–0.5	21.8	–16.0	6.2	5.0
Leguminous crops	–66.1	–61.4	–70.4	–80.1	–67.4
Oilseed crops	233.3	188.6	121.7	28.6	124.9
Sunflower	400.2	225.9	131.5	50.9	152.1
Rapeseed	256.0	5788.6	15271.9	912.3	2905.7
Soybean	22.9	–22.6	–88.3	–86.8	–62.1
Sugar beet	–65.5	–88.9	–99.9	–98.0	–88.4
Potatoes	–3.2	–33.5	–21.4	–8.9	–16.2
Vegetables	11.8	41.7	–4.5	33.8	21.9
Green maize fodder	–81.8	–94.0	–94.7	–97.5	–92.4
Flowers and ornamental plants	–66.0	–50.6	–39.9	–67.3	–55.4

Source: Calculations based on Tempo-Online data, NIS, 2012.

Thus, in the cereals category, *the area cultivated with oats* increased by 28.4%, mainly due to the increase in macro-region IV (+71%). The area under maize also increased by 5%, under the background of the increase in macro-region III (+21.8%) and of that in macro-region IV (+6.2%). Even though soybean, through its nutritional qualities, has gained a higher importance in the last years at least at the consumption level, the cultivated area constantly diminished, in the year 2011 reaching only 37. 9% of its level in 1990.

The same trend was also noticed in the area cultivated with sugar beet, mainly as a result of the involutions in the processing industry and of imports, to the detriment of the domestic production potential. An increase by almost 22% was noticed in the area cultivated with vegetables, the areas under vegetables increasing in three of the four macro-regions, from +11.8% (macro-region I) to +41.7% (macro-region II). The areas cultivated with green maize fodder and ornamental plants and flowers did not increase, the trend being obviously negative, with percentages ranging from –55.4% (flowers and ornamental plants) to –92.4% (maize fodder).

At regional level, the evolutions of the cultivated areas become even more noticeable, which largely explained the trend at national level (Table 2).

Table 2

Modifications produced at the level of cultivated areas by regions,
in the year 2011 compared to the year 1990 (%)

	North-West	Center	North-East	South-East	South-Muntenia	Bucharest - Ilfov	South-West Oltenia	West	Total
Grain cereals	−29.0	−26.7	−16.4	6.3	−0.04	−55.1	−4.8	−6.2	−8.4
Wheat	−50.0	−45.9	−59.6	−3.7	30.6	−32.6	11.2	−20.3	−13.6
Rye	−85.1	−77.0	−72.1	−65.0	0.8	1066.7	−74.1	−41.2	−72.2
Barley	−85.3	−92.7	−90.9	−44.9	−53.4	−86.7	−83.0	−84.8	−69.8
Oats	−10.8	−36.5	174.7	11.9	38.8	−34.2	214.1	37.3	28.4
Grain maize	−8.6	16.6	22.7	20.9	−13.4	−68.3	−3.4	19.2	5.0
Leguminous crops	−62.1	−76.7	−64.9	−59.9	−70.5	−55.6	−72.8	−90.3	−67.4
Oilseed crops	214.4	394.1	307.1	163.3	122.4	99.3	59.2	−1.5	124.9
Sunflower	364.3	3088.5	335.8	204.0	133.9	69.0	57.9	39.0	152.1
Rapeseed	114.5	11002.5	11751.1	5091.3	14863.1		1256.8	644.8	2905.7
Soybean	38.7	−13.2	83.9	−58.9	−88.1	−99.7	−99.6	−82.3	−62.1
Sugar beet	−80.2	−53.5	−81.2	−99.0	−99.9			−96.2	−88.4
Potatoes	−1.7	−4.3	−27.5	−57.6	−21.6	−16.5	6.3	−17.3	−16.2
Vegetables	2.6	26.4	81.6	14.7	−1.7	−23.0	41.6	23.7	21.9
Green maize fodder	−88.0	−75.4	−88.2	−97.7	−95.3	−86.4	−99.6	−95.7	−92.4
Flowers and ornamental plants	−58.7	−78.0	46.2	−90.5	67.9	−76.0	−23.5	−86.8	−55.4

Source: Calculations based on Tempo-Online data, NIS, 2012.

Thus, in the category **grain cereals**, South-Muntenia region increased its share in total cultivated area from 21.5% (1990) to 23.5% (2011), i.e. by 2 %. With 2.9%, South-East region increased its share in total area, being the second region with regard to the area cultivated with grain cereals.

South-Muntenia region is also the first region with regard to **the area cultivated with wheat**, increasing its share from 20.4% (1990) to 30.8% (2011), i.e. from 0.5 mil. ha in the year 1990 to 0.6 mil. ha in the year 2011. South-West Oltenia region is in the second place, with an obvious tendency in expanding the areas cultivated with wheat by 11.2%, this also increasing its share in total by 4 %. In **rye**, the 72.2 % diminution of the cultivated areas is due to the significant involutions at regional level, ranging from –41.2% (West) to +0.8% (region South-Muntenia). An exception is the region Bucharest-Ilfov, where the area cultivated with rye increased from 12 ha in 1990 to 140 ha in 2011.

The **area cultivated with barley** also followed an obviously negative trend in all the 8 development regions, with percentages ranging from –44.9% (South-East) and –92.7% (Center). The regions South-Muntenia and South-East are on the 1st and 2nd positions, with a diminution of their share in total area under barley in the year 2011 compared to 1990 by 13.6 % (South-Muntenia) and 16.9 % (South-East). Unlike barley, in **oats**, the cultivated area significantly increased in the year 2011 compared to 1990 in the region North-East, i.e. from 14,379 ha (1990) to not less than 39,504 ha (2011), an increase of the share in total from 10% to 11.4% being also noticed.

The area cultivated with maize significantly increased in 4 out of the 8 development regions, exceeding the national average by 5%. Thus, in the regions North-East and South-East, both the cultivated areas and their shares in total increased each year. The area under **leguminous grain crops** diminished by 67.4% per total country in the year 2011 compared to 1990, with percentages ranging from –55.6% (Bucharest-Ilfov) to –90.3% (West). As a region with the largest area cultivated with leguminous grain crops, South-East region increased its share in total by 7.7%, from 33.2% (1990) to 40.8% (2011) respectively.

An extremely significant increase of cultivated areas was noticed in oilseed crops both per total and by categories, the most significant increase being noticed in the case of **rapeseed**. Thus, the area under rapeseed increased from 13,064 ha in the year 1990 to 392,668 ha in the year 2011, South-Muntenia and South-East regions changing their shares in total from 7.4% to 36.8% (South-Muntenia) and from 20% to 34.5% respectively (South-East). Finally, in vegetables, 6 of the 8 development regions increased their cultivated areas, North-East region being on the first position with almost 82%. This region also increased its share in total from 11.9% (1990) to 17.7% (2011), i.e. from 25,661 ha in the year 1990 to no less than 46,605 ha in the year 2011.

4.2. Evolutions and disparities in the territorial allocation
of the physical crop production in the period 1990–2011

The physical crop production followed an oscillating trend in the period 1990–2011, similar to the evolutions of the areas cultivated with the main crop types. Thus, the most important increases were found in the oilseed crops, mainly in rapeseed, both per total and by macro-regions.

Table 3
Modifications produced in the physical crop production by macro-regions
in the year 2011 compared to 1990 (%)

	Macroreg. I	**Macroreg. II**	**Macroreg. III**	**Macroreg. IV**	**Total**
Grain cereals	3.5	44.8	11.8	17.0	21.4
Wheat	−36.8	−6.0	26.4	−2.7	−2.2
Rye	−75.9	−62.3	20.8	−65.1	−65.0
Barley	−90.9	−52.0	−61.8	−86.4	−70.4
Oats	3.8	132.8	30.5	122.5	60.6
Grain maize	86.5	120.9	21.7	66.3	72.1
Leguminous crops	−62.4	−13.4	−37.0	−51.5	−31.5
Oilseed crops	562.4	379.2	224.1	138.6	263.4
Sunflower	760.8	326.9	173.5	117.8	221.7
Rapeseed	550.7	12,181.0	26,283.4	2,964.1	6,704.5
Soybean	234.3	107.2	−57.2	−73.0	1.0
Sugar beet	−49.0	−80.4	−100.0	−95.1	−79.8
Potatoes	36.0	−2.0	74.8	65.1	28.0
Vegetables	47.0	92.3	48.5	112.8	77.2
Green maize fodder	−67.8	−87.6	−91.6	−94.0	−83.9
Fruit total	−3.6	−13.3	3.3	29.4	1.9

Source: Calculations based on Tempo-Online data, NIS, 2012.

A positive trend was also noticed in the physical production obtained in other crops (cereal grains, oat, maize, sugar beet, potatoes, vegetables and fruit) which, correlated with the cultivated area, reveals an increase of the average yields.

The evolutions across macro-regions are the direct effect of the modifications produced at regional level, by each crop. From this perspective, South-Muntenia region prevails in the physical production of rapeseed, revealing the general increasing trend, while North-East region prevails in the increase noticed in the case of grain maize (Table 4).

The increase of the physical production of vegetables and potatoes under the background of the diminution of the cultivated areas are the direct effect of the increase of average yields, inducing a modification by 87.9 % of the physical production of vegetables and by 46.2% in the case of the potato physical production.

Table 4

Modifications produced in the physical crop production by regions
in the year 2011 compared to the year 1990 (%)

	North-West	Center	North-East	South-East	South-Muntenia	Bucharest-Ilfov	South-West Oltenia	West
Cereals	5.5	0.8	21.2	62.8	15.3	−52.5	1.7	39.5
Wheat	−37.1	−36.4	−53.2	33.5	29.1	−30.9	−2.9	−2.5
Rye	−76.4	−75.6	−64.4	−53.4	13.7	751.6	−69.5	−32.4
Barley	−88.5	−93.1	−90.4	−36.1	−59.5	−87.9	−87.7	−84.7
Oats	21.5	−21.7	230.7	45.2	32.1	−10.5	248.4	95.0
Grain maize	71.9	115.4	117.1	124.0	26.0	−60.5	30.0	130.4
Leguminous crops	−59.9	−69.9	−35.4	0.1	−37.3	−7.6	−16.4	−83.5
Oilseed crops	495.4	1,484.5	793.0	310.5	228.5	109.2	162.6	114.1
Sunflower	683.7	13,287.1	618.9	277.7	178.1	66.0	134.5	96.0
Rapeseed	282.1		18,396.9	1,013.8	25,692.7		2741.0	3,205.5
Soybean	253.3	176.1	576.0	16.6	−56.1	−99.4	−98.9	−63.5
Sugar beet	−65.0	−37.5	−68.5	−97.2	−100.0			−91.3
Potatoes	45.2	30.7	−0.1	−15.0	74.4	87.3	102.9	46.2
Vegetables	41.9	54.3	126.3	70.7	59.9	0.7	131.2	87.9
Green maize fodder	−76.5	−61.3	−79.1	−96.1	−92.1	−86.4	−99.2	−91.4
Fruit total	−1.0	−10.1	−9.6	−17.6	8.4	−80.2	46.0	6.8

Source: Calculations based on Tempo-Online data, NIS, 2012.

4.3. The agricultural crop production value –
expression of the available resources utilization

As an effect of the combination of the production factors and prices obtained from the sale of the obtained products, the value of the agricultural crop production, recalculated in 2010 prices, was down by 32.3%, in the year 2010 compared to 1990, the same trend being also maintained at the level of the macro-regions[1].

Thus, from 64,261 mil.lei in 1990, the value of the agricultural crop production diminished up to 43,488 mil.lei in the year 2010, representing 67.7% of the level of the base year (1990). By micro-regions, the most significant decline was noticed in micro-region III (–41.7%), exceeding the national average, as a negative effect, by 9.4% (Table 5).

The crop agricultural production increased its share in total agricultural production value in a period of 21 years, from 53% in the year 1990 to 67.5% in the year 2010, to reach a maximum value, close to 70%, in the agricultural year 2003.

As share in total, the period 1990–2010 is characterized by an increasing trend of the value of agricultural crop production from macro-region I (+1.7 %), followed at a small distance by macro-region IV (+1.4 %). Thus, from 21.7% in the

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[1] We must specify that the GDP deflator was used for the recalculation into comparable prices.

year 1990, macro-region I reached 23.4% in the year 2010, while macro-region IV increased its share from 22.8% (1990) to 24.2% in the year 2010. At regional level, all the 8 development regions are characterized by a tendency of diminution of the agricultural production value with percentages ranging from –16% (West) to –59.3% (Bucharest-Ilfov).

Table 5

The evolution of the agricultural crop production in the period 1990–2010
by micro-regions (mil.lei 2010 prices)

	Macroreg. I	Macroreg. II	Macroreg. III	Macroreg. IV	Total
1990	13929	21118	14561	14653	64261
1991	17014	23173	16424	20032	76644
1992	14502	21074	13716	13650	62941
1993	17717	27078	14523	13803	73121
1994	16101	18340	14054	18105	66600
1995	17216	19633	12617	15171	64636
1996	18559	21164	12522	15922	68166
1997	14740	22267	13551	16320	66879
1998	11741	16241	9067	11725	48775
1999	11653	17113	9690	11454	49910
2000	12063	14319	7001	9399	42782
2001	13295	15970	10648	14159	54072
2002	13241	16129	7264	8968	45602
2003	14336	17419	8622	12585	52961
2004	16416	21595	13712	15682	67404
2005	11317	14832	7996	9961	44106
2006	12408	14622	7842	9824	44696
2007	11572	10853	5893	7778	36097
2008	12478	16741	9637	11020	49876
2009	9910	11905	6983	8623	37421
2010	10175	14282	8493	10539	43488
2010/1990 (%)	**–27.0**	**–32.4**	**–41.7**	**–28.1**	**–32.3**

Source: Calculations based on Tempo-Online data, NIS, 2012.

As an effect and efficiency indicator, the agricultural crop production value per arable area, agricultural area respectively, diminished by almost 32% in both cases. Thus, from 6,799.8 lei crop production/ha arable area in the year 1990, it reached 4,624 lei crop production/ha arable land in the year 2010. The same trend is also maintained in the agricultural crop production per agricultural area. From this perspective, the crop production value diminished from 4,351 lei/ha agricultural land in the year 1990 to 2,971.4 lei/ha agricultural area in the year 2010, i.e. by 31.7% (Table 6).

Table 6

The comparative evolution of the agricultural crop production per ha
of arable and agricultural land area in the period 1990–2010 (lei/ha)

	Value of agric. prod./ha arable area	Value of agric. prod./ha agricultural area
1990	6799.8	4351.0
1991	8133.2	5179.2
1992	6726.7	4255.6
1993	7827.6	4942.9
1994	7132.1	4500.7
1995	6922.5	4368.1
1996	7299.1	4609.3
1997	7159.5	4520.7
1998	5216.1	3295.2
1999	5333.4	3388.2
2000	4560.4	2879.6
2001	5751.4	3640.6
2002	4852.0	3073.6
2003	5625.6	3598.5
2004	7153.9	4581.7
2005	4682.1	2992.0
2006	4737.5	3034.2
2007	3830.6	2454.0
2008	5297.4	3392.4
2009	3971.4	2548.2
2010	4624.0	2971.4
2010/1990 (%)	**−32.0**	**−31.7**

Source: Calculations based on Tempo-Online data, NIS, 2012.

4.4. The efficiency of the agricultural crop production in non-conventional units – territorial allocation and disparities

In order to have an overview of the efficiency of the available resources utilization, our approach tried to construct an indicator, expressed in non-conventional units per total country, macro-regions and regions. In this respect, the indicator used in measuring the efficiency of agricultural crop production refers to the evolution of the physical production, expressed into Cereal Units (CU) per 100 hectares of agricultural and arable land. For the transformation into cereal units, a series of coefficients[2] was used, as follows:

- Wheat – 1.07;
- Barley – 1.0;
- Rye – 1.01;
- Oats – 0.85;

[2] Kreitmair, S., (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

- Maize – 1.1;
- Potatoes – 0.22;
- Sugar beet – 0.47;
- Leguminous crops – 0.92;
- Rapeseed – 2.46;
- Vegetables – 0.57;
- Fruit – 0.86;
- Silo maize – 0.18.

Following the application of coefficients to the categories specific to the crop products expressed into CU tons, we found out that crop production expressed into CU tons increased by 18.5% per total country in the year 2011 compared to 1990, with variations from one macro-region to another, the variations ranging from –2.6% (macro-region I) to +36.1% (macro-region II).

The evolutions at macro-regional level are the effect of the modifications produced at regional and county level. From this perspective, in the year 2011 compared to 1990, the most important increase of the crop production expressed into CU tons was found in South-East region (+54.7%), while Bucharest-Ilfov region lay at the opposite pole, with about 44% diminution.

The crop production in CU tons per 100 ha arable land increased by 19.7% in 2011 compared to 1990, a similar percentage being also obtained per 100 ha agricultural land. Thus, while the crop production increased from 254.4 CU tons/100 ha arable land in 1990 to 304.6 CU tons/100 ha arable land in 2011, the crop production per 100 ha agricultural land increased from 162.8 CU tons (1990) to 195.3 CU tons (2011).

By macro-regions, the most significant increase of crop production per 100 hectares arable land was noticed in macro-region II (+33.8%), while a minimum level of only 1.3 % (Table 7) was found in macro-region I.

The same favourable evolution can be also noticed at the level of the development regions. Thus, with plus 51.9% in the year 2011 compared to 1990, South-East region is on the first place from the point of view of the crop production expressed in CU tons per 100 hectares arable land (Table 8).

On the other hand, macro-region II holds the same first position as regards the crop production expressed in CU tons per 100 hectares agricultural land. Thus, from 161.9 CU tons/100 ha agricultural land in 1990, it reached 218.5 CU tons /100 ha agricultural land in 22 years' time (Table 9).

By regions, out of the 8 development regions, 5 experienced increases of the above-mentioned indicator, ranging from +10.3% (South-West Oltenia) to +53.1% (South-East). At the opposite pole we find the regions Bucharest-Ilfov, Center and North-West, where the production expressed in CU tons/100 hectares agricultural land decreased, the decrease ranging from –38% (Bucharest-Ilfov) to –1.1% (North-West) (Table 10).

Table 7
Evolution of the agricultural crop production per 100 ha arable land (CU tons/100 ha)
in the period 1990–2011 by macro-regions

	Macroreg. I	Macroreg. II	Macroreg. III	Macroreg. IV	Total
1990	247.9	226.3	294.8	261.0	254.4
1991	236.8	259.8	302.2	310.2	277.5
1992	176.1	185.1	221.7	178.7	190.0
1993	249.3	262.6	235.2	185.6	234.7
1994	235.9	192.6	272.1	329.8	253.0
1995	264.4	229.4	308.7	310.3	274.0
1996	261.5	197.4	197.8	236.3	219.4
1997	254.9	307.0	324.1	317.0	303.4
1998	205.4	217.1	215.4	251.9	223.2
1999	198.9	240.2	258.5	258.9	241.1
2000	173.3	156.8	157.1	149.4	158.2
2001	260.1	203.8	280.5	307.1	257.3
2002	241.2	209.6	181.4	178.3	201.5
2003	238.6	190.6	154.9	222.7	199.8
2004	320.6	296.3	335.8	360.0	325.5
2005	252.9	260.2	265.2	297.5	269.2
2006	225.4	220.6	238.6	255.2	234.1
2007	193.3	121.2	113.9	134.0	136.5
2008	225.1	251.8	268.3	244.4	248.5
2009	202.6	211.8	247.9	249.7	227.4
2010	221.5	257.9	292.7	255.7	258.1
2011	251.0	302.9	348.5	308.3	304.6
2011/1990 (%)	1.3	33.8	18.2	18.1	19.7

Source: Calculations based on the paper: Kreitmair S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

Table 8
Evolution of the agricultural crop production per 100 ha arable land (CU tons/100 ha)
in the period 1990–2011 by regions

	North-West	Center	North-East	South-East	South-Muntenia	Bucharest - Ilfov	South-West Oltenia	West
1990	237.5	261.9	244.5	212.6	292.6	334.0	282.8	236.7
1991	245.9	224.4	247.1	269.4	299.9	343.6	352.6	263.1
1992	163.3	193.1	186.0	184.5	220.5	243.1	204.9	149.3
1993	250.8	247.3	292.5	240.2	229.5	337.5	151.5	224.2
1994	229.3	244.6	223.4	169.5	267.8	347.7	357.0	299.1
1995	266.1	262.2	254.1	210.8	306.8	341.9	329.9	288.0
1996	277.3	240.8	211.8	186.7	196.8	215.9	203.0	273.9
1997	261.0	246.9	289.1	320.3	324.2	322.5	343.9	286.4
1998	221.3	184.4	252.3	191.0	214.8	226.5	250.5	253.5
1999	205.6	190.2	247.2	234.9	256.8	289.7	284.9	229.4
2000	173.6	172.9	168.6	148.0	157.9	144.0	136.6	163.9

Table 8 (continuation)

2001	268.2	249.6	250.0	169.0	280.3	283.6	316.3	296.7
2002	249.4	230.5	262.9	169.4	180.3	201.9	119.6	245.2
2003	247.7	226.6	211.2	175.1	154.1	168.8	190.3	260.0
2004	333.3	303.8	277.2	310.7	332.9	388.3	362.5	357.1
2005	272.1	227.5	264.1	257.2	264.2	283.3	314.7	277.8
2006	238.2	208.4	239.3	206.3	237.5	258.2	256.3	253.9
2007	202.8	180.7	138.4	108.1	115.1	92.7	94.4	179.6
2008	234.1	213.0	250.0	253.2	274.0	161.3	253.4	234.1
2009	191.1	218.0	230.6	197.5	253.5	141.9	277.4	217.9
2010	225.9	215.5	237.7	273.1	297.3	202.8	269.0	240.4
2011	240.3	266.2	276.5	322.8	355.7	207.3	308.0	308.6
2011/1990 (%)	1.2	1.6	13.1	51.9	21.6	–37.9	8.9	30.4

Source: Calculations based on the paper: Kreitmair S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

Table 9

Evolution of the agricultural crop production per 100 ha agricultural land (CU tons/100 ha) in the period 1990–2011 by macro-regions

	Macroreg. I	**Macroreg. II**	**Macroreg. III**	**Macroreg. IV**	**Total**
1990	112.4	161.9	241.5	163.7	162.8
1991	106.5	184.8	246.6	194.2	176.7
1992	78.6	131.4	180.4	110.3	120.2
1993	110.2	186.6	190.9	114.6	148.2
1994	104.4	136.6	219.8	204.4	159.6
1995	117.1	162.7	249.6	191.9	172.9
1996	115.9	140.1	160.0	146.3	138.6
1997	113.1	217.9	262.3	195.9	191.6
1998	91.1	154.4	174.2	155.6	141.0
1999	88.0	170.8	209.0	164.0	153.2
2000	76.2	111.8	127.0	92.6	99.9
2001	114.6	145.7	226.8	191.2	162.9
2002	106.3	150.0	146.8	111.0	127.7
2003	106.7	136.7	125.9	141.1	127.8
2004	143.4	213.1	272.9	228.2	208.5
2005	112.3	187.0	215.7	188.6	172.0
2006	100.7	158.8	194.1	161.8	149.9
2007	86.7	87.2	92.7	85.0	87.4
2008	100.8	181.3	218.3	154.7	159.2
2009	90.9	152.7	201.8	158.6	145.9
2010	99.5	186.1	238.1	163.0	165.8
2011	111.2	218.5	283.7	196.3	195.3
2011/1990 (%)	–1.1	34.9	17.5	19.9	19.9

Source: Calculations based on the paper: Kreitmair S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

Table 10
Evolution of the agricultural crop production per 100 ha agricultural land (CU tons /100 ha)
in the period 1990–2011 by regions

	North-West	Center	North-East	South-East	South-Muntenia	Bucharest-Ilfov	South-West Oltenia	West
1990	120.0	104.2	157.8	165.8	237.9	318.8	193.4	136.0
1991	122.7	89.2	158.6	208.6	242.8	325.1	240.7	150.9
1992	80.3	76.7	118.9	142.7	178.1	229.5	139.1	83.6
1993	121.5	98.1	187.6	185.7	184.8	317.3	103.1	125.3
1994	111.2	97.1	143.0	130.7	214.6	326.9	243.2	168.2
1995	129.2	104.1	162.6	162.7	246.1	321.4	224.8	161.3
1996	134.7	95.6	135.2	144.5	158.0	203.0	138.7	153.4
1997	127.0	98.2	184.6	248.0	260.4	303.5	235.1	159.4
1998	107.7	73.2	160.9	148.6	172.4	213.0	171.3	141.1
1999	99.9	75.3	157.7	182.7	205.9	273.1	194.9	134.0
2000	83.3	68.5	108.1	115.2	126.6	135.4	93.7	91.7
2001	129.1	98.9	161.1	131.7	224.9	266.8	218.3	166.0
2002	120.2	91.3	169.6	132.1	144.8	189.8	82.6	137.3
2003	120.0	92.0	136.5	136.9	124.3	158.7	132.1	149.7
2004	162.0	122.9	179.7	243.5	268.5	367.1	251.9	205.6
2005	132.5	90.5	171.2	201.4	213.2	269.8	218.6	159.9
2006	116.0	83.9	155.7	161.6	191.6	246.1	178.3	146.1
2007	99.0	73.2	89.9	84.6	92.9	88.6	65.6	103.4
2008	114.4	85.9	162.5	198.3	221.2	154.2	176.0	134.4
2009	93.8	87.8	150.0	155.2	204.7	135.6	192.8	125.9
2010	111.6	86.3	154.7	214.7	240.0	193.6	187.0	139.9
2011	118.8	102.8	179.9	253.7	287.4	197.8	213.3	179.8
2011/ 1990 (%)	–1.1	–1.3	14.0	53.1	20.8	–38.0	10.3	32.2

Source: Calculations based on the paper: Kreitmair S. (1989), *Neuberechnung der Gesantversorgung und landwirtschaftlichen Erzengnissen*, no. 4, Agrarwirtschaft.

Without considering the present analysis exhaustive from the point of view of the formation and utilization of available resources, we can nonetheless conclude that this represents a synthesis of the modifications produced after 1990 in the formation of the agricultural crop production, one of the input components of the gross value added of the agricultural sector. Moreover, capturing the territorial allocations of the factors and resources can represent a starting point in the identification of the investment poles in the future.

5. CONCLUSIONS

The analysis of the sectoral performances in the field of agriculture should not omit the knowledge of the main modifications produced at the level of inputs.

It is also the case of the agricultural crop production, which, together with the agricultural animal production, represents, both in physical and in value terms, factors of influence of the gross value added and of measuring the efficiency of the agri-food sector.

From this perspective, a special place in the analysis was the capturing of the main modifications produced at the level of allocations of factors and resources in the formation of the agricultural crop production in Romania.

Synthetically speaking, the present analysis made it possible to draw the following conclusions:

• In terms of land resources, as basis of crop production formation, the agricultural and arable areas had a slightly decreasing trend, as a result of the modifications produced at macro-regional and regional level, at least from the agricultural land destination perspective.

• The areas cultivated with the main crops significantly diminished, except for those under oilseed crops, mainly rapeseed, which, due to the industrial utilization possibilities made this crop be a profitable one, in the conditions of its cultivation on large areas.

• The agricultural crop production increased in physical terms, which, by contrast with the cultivated area, explains the increase of the obtained average yields.

• The value of the agricultural crop production decreased in the reference period 1990–2010, in the year 2010 reaching 67.7% of its level in the base year 1990. Anyhow, by macro-regions, the strongest decline was found in macro-region III (–41.7%), exceeding the national average, as negative effect, by 9.4 %.

• By arable area, by agricultural area respectively, the value of the agricultural crop production diminished by almost 32% in both cases; from 6,799.8 lei crop production/ha arable area in the year 1990 it reached 4,624 lei crop production /ha arable area in the year 2010, while from 4,351 lei/ha agricultural area in the year 1990 it reached 2,971.4 lei/ha agricultural area in 2010, representing a diminution by 31.7%.

• As a result of production increase in physical terms, the agricultural production expressed in cereal units increased by 18.5% per total country in the year 2011 compared to 1990, with variations from one macro-region to another, the oscillation ranging from –2.6% (macro-region I) to +36.1% (macro-region II); the same trend can be also noticed in crop production, expressed in CU tons, which in the year 2011 increased by 19.7% compared to 1990, a similar percentage being also found per 100 ha agricultural land.

The evolutions at the level of resources and their territorial allocation in the last 22 years can represent for decision-makers and not only, a starting point in establishing future development strategies, which should permit a better utilization

of the present resources and a superior utilization of the obtained yields, with direct effects upon the final consumers' welfare and the improvement of the sectoral performance by comparison with that obtained in the other countries.

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