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## The evolution of the main indicators of agriculture in the North-East Region of Romania

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# THE EVOLUTION OF THE MAIN INDICATORS OF AGRICULTURE IN THE NORTH-EAST REGION OF ROMANIA

OLTEANU VICTOR<sup>1</sup>

## Abstract

*In the article, we watched developments in the last 10 years, for the region of North-East of Romania, in the following areas: available land, technical-material base of agriculture, the agricultural area, agricultural crop Production, Livestock and crop production, livestock and farm animal animals a few inputs in agriculture: chemical fertilizers, plant protection treatments.*

**Key words:** *available land, improvements to land, crop production and cattle breeding*

## INTRODUCTION

The North east region is a development region in Romania, which was incurred, as well as other areas of regional development, following the adoption of law 151/1998 on regional development in Romania. According to the law, this is not an administrative-territorial unit and does not have legal personality. The region thus formed is on implementation and evaluation of regional development policy. The North-East region is made up of six counties in the historical region of Moldavia: Bacău, Botoșani, Iași, Neamț, Suceava and Vaslui. The total area of the region is 36,850 km<sup>2</sup>, with a population of 3.712.396 inhabitants (estimated 2010), making it the region with the highest density of the country.

The landscape is varied, and has included the full range of relief on the territory of Romania. Maximum altitude is 2,100 meters, of top of Călimani Mountains Pietrosul (Suceava County), and the minimum in the 100 meters, the Valley of the Prut River. Moldavian plateau is present in each of the six counties. The territories of the counties of Iași and Botoșani, Vaslui are sub-units of plain and Meadow belonging to the Plain and the embankment of the Prut River. The region is drained by a number of significant water eight courses, which is divided on the North-South direction, the largest catchments areas returning the Siret River (42.890 km<sup>2</sup>) and Prut (10.990 km<sup>2</sup>).

Climate varies according to relief. The annual average temperature of 0 ° C and a rainfall of 1400 mm on the highest mountain peaks in the Călimani temperatures 9.8 ° C (Bârlad) and rainfall of 450-500 mm (plain areas in the counties of Iași and Botoșani, Vaslui). The vegetation and fauna are determined by climate and terrain, ranging from Alpine and underalpin area on the mountain peaks in Romania on the second floor of the steppe, and the counties of Iași and Vaslui, Botoșani.

## MATERIAL AND METHODS

In this article the method of analysis was used in calculating the dynamics and interpretations have been made of the Land Fund, technical-material base of agriculture, the agricultural area, agricultural crop Production, Livestock and crop production, livestock and a few inputs in agriculture: chemical fertilizers, plant protection treatments to determine the context of the economic and development of agriculture in the region of North-East. of Romania.

## RESULTS AND DISCUSSION

### *Available land.*

As regards the evolution of the Land, presented in table 1 is this evolution in Dynamics, reference year 2000. Although the share of private property in land fund structure has increased in the period 2000-2010, a slight decrease of agricultural purpose (by 0.4%), and increasing non-

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agricultural surface instead. Reduction of the total agricultural area is due to the decrease in the areas for pasture (-2.3%), vines and vineyards (-18.8%), fruit orchards and nurseries (26.4%).

**Table 1 The evolution of the Land Fund in the period of use 2000 – 2010 (2000 = 100%)**

Use form	Property type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	total	100	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	private	100	100.2	101.3	103.1	104.0	104.9	107.6	109.4	109.8	109.7	111.1
Agriculture	total	100	99.9	100.0	100.1	99.9	99.9	100.5	99.8	99.8	99.7	99.6
	private	100	99.8	99.8	99.5	99.4	99.5	99.3	98.5	98.0	97.7	97.2
Arable	total	100	100.4	100.6	100.8	101.1	101.1	102.0	101.2	101.2	101.2	101.1
	private	100	100.4	100.6	100.7	100.9	100.9	102.2	101.3	100.5	100.4	99.9
Pastures	total	100	98.7	98.8	98.9	98.1	98.3	97.2	97.9	98.3	98.0	97.7
	private	100	98.6	98.3	97.0	96.3	96.7	91.5	92.0	92.1	90.8	90.5
Hayfields	total	100	100.5	100.5	100.7	100.4	100.4	103.0	101.4	101.4	101.6	101.5
	private	100	100.5	100.6	101.0	100.9	101.0	104.0	102.4	102.5	102.7	103.3
Vineyards and nurseries	total	100	97.1	94.7	90.3	87.1	87.2	87.7	82.5	78.8	78.2	77.9
	private	100	97.0	94.6	90.1	86.8	86.9	87.5	82.2	78.4	77.8	75.8
Orchards and nurseries	total	100	97.4	92.8	90.9	89.8	88.1	83.3	74.8	73.5	72.8	73.6
	private	100	97.0	92.2	90.3	89.0	87.2	85.5	76.6	75.6	75.1	73.5
Total non-agricultural land	total	100	100.1	100.1	99.9	100.1	100.1	99.4	100.3	100.3	100.4	100.6
	private	100	103.2	113.6	133.6	142.6	150.9	178.4	202.0	210.6	212.0	229.7
Forest and other forest	total	100	103.8	103.8	103.5	103.9	103.8	103.8	103.7	103.7	103.9	104.1
	private	100	116.9	154.5	210.4	236.3	259.8	361.1	416.2	450.8	458.6	496.3
Water	total	100	99.9	99.8	97.6	97.3	97.3	100.0	100.5	100.2	100.3	99.8
	private	100	99.9	82.3	89.3	86.0	87.3	94.3	94.6	98.3	85.8	115.7
Constructions	total	100	100.4	100.4	101.6	103.2	104.3	108.8	109.5	109.8	110.1	112.1
	private	100	101.5	101.9	108.9	112.2	113.7	122.9	124.2	124.3	124.4	126.2
Communications routes and railways	total	100	99.9	100.0	99.8	99.8	99.6	97.2	97.6	97.7	97.5	97.1
	private	100	97.7	97.9	84.9	94.7	95.4	71.5	76.5	80.0	75.8	85.2
Degraded and unproductive	total	100	69.7	69.2	70.6	68.6	69.3	57.7	67.5	67.8	66.8	66.7

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

Of the total land, private property grew by 129,7 percent. This growth is mainly occupied with developments in the areas of forests and other vegetation, forest rose almost 5 times (in anul 2010 compared with 2000). On the other hand, degraded and unproductive land declined by 33.3%.

### ***Technical-material base of agriculture.***

In this region, from the point of view of agricultural equipment, surface arable the tractor is of 69 hectares (at the level of the year 2010).

**Table 2 Endowment with machinery and equipment in the period 2000-2010 (2000 = 100%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Tractors	100.0	98.9	97.1	98.9	102.6	109.2	109.9	110.5	112.2	114.7	116.6
Plows for tractors	100.0	100.9	101.9	104.3	110.0	110.9	113.8	115.3	117.2	118.2	121.8
Mechanical cultivators	100.0	82.4	87.0	83.3	91.8	75.8	78.5	79.6	80.6	81.9	80.6
Mechanical seeders	100.0	98.1	98.2	98.1	101.0	105.8	110.2	110.6	114.3	116.3	118.4
Mechanical machinery for spray and dust	100.0	105.6	93.1	93.9	90.7	86.0	90.1	96.6	92.7	92.5	75.4
Mechanical combines for cereal harvest	100.0	91.2	89.5	87.2	85.2	88.3	86.7	86.4	81.6	84.7	84.3
Mechanical combines for fodder harvest	100.0	74.4	60.6	55.2	56.7	32.0	39.9	37.9	37.4	40.9	37.9
Mechanical combines for potatoes harvest	100.0	106.4	110.3	126.5	135.8	136.8	132.3	143.6	151.9	159.1	158.6
Hay and straw presses	100.0	74.8	61.9	61.2	65.4	49.0	67.4	69.9	79.3	88.9	102.7
Fodder vindovere	100.0	81.6	68.9	68.9	63.1	51.6	57.8	56.1	54.5	57.4	54.1

Source: Calculation on data from Statistical Yearbook of Romania, 2001-2010.

The data in table 1.2, it appears that the low number of mechanical cultivators, with 19.4% of steam machines and dusty with mechanical traction, with 24,6% of their combinations for self-propelled harvesters with 15.7%, but the most drastic declines are observed to combine harvesters, self-propelled forage harvesters for having reached the level of 37.9% compared to the year 2000 and reference Fodder vindovere for animal feed decreased to 54,1% compared to 2000. A positive evolution is found at the level of their cars and harvested potatoes, their number increased to 58,6%. Positive developments have had and the number plows for tractors for tractors (21.8%), with mechanical seeders of mechanical (18.4%) and al mills for straw and hay with only (2,7%).

Taking into account that the arable of the region decreased during the analysis period, the increase in the number of agricultural machines do not represent an economic benefit for those working in agriculture. On the other hand, this increase is due to the increase in the share of private property in Land Fund total.

#### ***Agricultural plant area.***

North-East region is not a traditional region for the production of grain, and the meteorological conditions, redistribution agricultural areas and market requirements has shown that during the analysis period, farmers had turned his attention to the cultivation of industrial plants. The area under rape increased 6.7-fold, with soybeans grown by approximately 4.4 times, at the expense of, say, the area cultivated with cereals, sugar beet and pulses, which took most of the dramatic decrease in 2004, less than a third compared with the year 2000.

**Table 3 The main crops cultivated area in the period 2000-2010 (2000 = 100%)**

Principally culture	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cereal grains	100	107.7	104.5	98.1	108.1	100.0	87.2	88.7	83.8	82.7	79.7
Wheat and rye	100	144.2	136.6	96.0	134.6	129.2	98.3	105.8	105.1	102.1	97.6
Rye	100	81.8	81.1	81.9	143.3	153.5	133.5	95.0	123.2	133.5	93.8
Wheat-total	100	145.8	138.1	96.3	135.0	128.6	97.3	106.1	104.7	101.3	97.7
Common wheat	100	146.4	138.7	96.8	135.6	129.0	97.8	106.6	105.1	101.1	97.4
Barley	100	96.0	108.2	62.9	49.2	74.9	63.0	76.0	77.1	85.0	62.3
Maize	100	99.6	95.7	101.7	107.6	94.2	85.3	83.8	76.9	75.4	74.5
Legumes	100	99.6	115.5	114.2	64.8	90.3	84.2	79.3	77.7	68.4	67.9
Pea seeds	100	83.2	97.0	86.1	50.4	75.9	57.5	74.3	50.8	45.4	50.1
Beans	100	103.6	120.2	119.8	67.8	94.1	89.5	81.1	84.0	73.8	69.8
Oil plants	100	107.6	120.0	156.1	155.0	179.4	164.2	196.5	175.1	200.7	176.0
Sunflower	100	111.6	116.8	152.5	148.6	166.9	138.1	141.3	124.4	128.4	123.7
Rape	100	93.3	175.2	21.1	194.5	226.5	242.3	763.8	924.0	1259.7	667.1
Soybeans	100	73.2	116.4	246.3	186.2	292.1	396.5	465.6	281.5	352.8	438.0
Sugar beet	100	77.9	88.1	72.3	28.8	36.8	67.2	50.8	34.0	33.3	32.6

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

#### ***Agricultural production crop.***

Although the area under cereal cultivation has decreased, the total production of these crops grown, which means an increase of productivity per unit area planted. Decrease of vegetal production to just cultures is evident and the area in which declined significantly (e.g., beet sugar, which in 2004 was at the level of 46.5% compared to 2000). Increases in total production from rape is observed (production has increased about 20 times in 2010 and 35 times in 2008). Interesting is that the production of medicinal herbs and aromatic rose 34 times in 2004, dropping in the coming years, and in 2010 again increased 24 times. Potato production has had a slight growth, by around 5% in 2001 and 2002, decreasing gradually afterwards to 79.4% in 2010 compared to 2000.

**Table 4 Total production of the main crops produced in the period from 2000-2010 (2000=100%)**

Grains	100.0	167.6	175.9	130.3	182.3	176.0	149.6	76.0	163.9	143.4	155.8
Wheat and rye	100.0	236.0	208.2	46.8	179.9	219.7	161.6	105.4	190.1	150.8	149.0
Rye	100.0	115.2	115.7	57.5	200.2	198.4	182.5	128.6	180.1	172.2	130.6
Wheat - total	100.0	238.9	210.4	46.5	179.4	220.2	161.1	104.8	190.4	150.3	149.4
Common wheat	100.0	240.0	211.4	46.7	180.2	220.9	161.9	105.3	191.1	150.0	149.0
Barley	100.0	167.4	158.2	41.0	79.2	108.2	88.5	65.8	133.9	112.9	95.3
Barley	100.0	138.1	138.6	87.1	111.6	152.0	147.3	123.0	163.6	134.8	139.4
Maize	100.0	149.9	169.6	161.1	192.2	168.8	149.7	66.0	157.9	143.2	161.5
Legumes	100.0	189.5	174.5	151.4	233.3	137.6	131.2	66.6	94.9	90.8	98.2
Pea seeds	100.0	133.4	131.1	85.2	78.5	115.1	88.5	45.7	56.1	72.2	70.1
Beans	100.0	201.7	183.9	164.9	267.6	142.5	140.0	71.4	103.6	94.9	102.4
Oil plants	100.0	142.9	211.6	233.7	224.7	273.1	266.7	174.1	321.3	297.3	309.7
Sunflower	100.0	139.9	202.6	230.3	199.1	227.8	209.7	98.7	193.2	183.0	198.8
Rape	100.0	335.8	410.3	37.4	784.7	902.0	620.3	1618.5	3565.6	3350.0	2057.8
Soybeans	100.0	110.2	237.3	324.7	306.8	563.5	770.0	518.4	631.8	515.3	928.0
Sugar beet	100.0	96.8	122.9	85.2	46.5	55.0	123.3	71.0	69.3	70.5	76.2
Medicinal and aromatic plants	100.0	604.5	540.9	1477.3	3418.2	668.2	622.7	9.1	568.2	413.6	2404.5
Potatoes - total	100.0	105.6	105.6	99.3	97.6	96.9	102.2	81.1	88.2	97.3	79.4

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

### ***Livestock and animal production***

Livestock development in the period under review has seen a growth if we refer the number of animals per cent hectares, but in 2010 it decreased: about 20 percent in cattle, buffaloes, cows, and heifers with 7,5% from 10,7%, with breeding sows. In sheep and goats, the largest decrease was recorded in 2004, when the number of animals per 100 hectares fell by 14.1%.

**Table 5 The number of animals per 100 hectares in the region North East 2000-2010 (2000=100%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cattle	100.0	97.5	104.1	104.4	100.3	106.3	110.5	111.4	112.7	107.3	80.6
Buffalo cows and heifers	100.0	99.5	102.6	102.1	101.0	107.3	106.8	105.2	105.2	103.7	79.1
Swine	100.0	91.9	107.0	103.1	125.7	131.1	137.7	129.2	124.8	115.5	92.5
Swine for breeding	100.0	103.6	125.0	107.1	125.0	153.6	175.0	157.1	125.0	110.7	89.3
Sheep and goats	100.0	97.2	97.9	97.5	85.9	91.6	93.1	107.9	119.6	122.9	99.0
Sheep, and goats	100.0	101.2	101.9	98.4	90.5	100.4	102.5	119.5	131.9	133.8	111.4

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

### ***Livestock.***

Total number of animals recorded a fall in 2010 compared to the year 2000: the cattle by almost 20%, heifers, cows and buffaloes with over 20%, of pigs by 7.5%. It was observed a rise in herds of sheep and goats, Ewe in the period 2005-2010, with growth being greater than in 2009, when their number increased by 33.8%. Although on the whole, the number of animals in the region has increased over the period considered, it seems that 2010 had a decreasing trend, below the level of 2000.

**Table 6 Livestock categories of animals in the region North East 2000-2010 (2000=100%)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cattle	100.0	97.5	104.1	104.4	100.3	106.3	110.5	111.4	112.7	107.3	80.6
Buffalo cows and heifers	100.0	99.5	102.6	102.1	101.0	107.3	106.8	105.2	105.2	103.7	79.1
Swine	100.0	91.9	107.0	103.1	125.7	131.1	137.7	129.2	124.8	115.5	92.5
Swine for breeding	100.0	103.6	125.0	107.1	125.0	153.6	175.0	157.1	125.0	110.7	89.3
Sheep and goats	100.0	97.2	97.9	97.5	85.9	91.6	93.1	107.9	119.6	122.9	99.0
Sheep, and goats	100.0	101.2	101.9	98.4	90.5	100.4	102.5	119.5	131.9	133.8	111.4

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

Evolution of agricultural inputs has experienced an increasing trend over the period 2000-2010, at least in terms of the amount of fertilizers managed to level the region North-East. Increased both the amount of chemical fertilizers (even with 88% in 2009), but also the quantity of natural fertilizers (the highest growth was recorded in 2005, with 54,6%).

**Table 7 Evolution dynamics of fertilizers administered in the region North East 2000-2010**

Fertilizers	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Chemical	100.0	97.6	90.4	125.0	117.4	151.6	121.8	124.5	99.4	188.0	104.1
Nitrogen	100.0	95.0	89.1	119.4	112.2	138.7	112.4	110.9	94.2	175.6	104.4
Phosphate	100.0	103.2	92.2	134.6	125.0	167.9	140.6	151.5	102.4	170.3	94.7
Potash	100.0	105.2	101.1	161.0	158.9	274.3	159.5	180.1	173.6	545.6	166.2
Natural	100.0	105.1	105.8	114.1	121.6	154.6	114.8	117.6	67.9	105.3	129.8

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

Pesticide application records a still increasing over the past five years, consider the highest growth tragedy in 2009 to insecticides (38.1%) and with the fungicides (10.5%). Instead, the seeds, the highest growth was recorded in the year 2010, when the area that have been treated with herbicides increased by 89,4%.

**Table 8 Dynamics of surfaces that have been treated with pesticides during the period 2000-2010 in the region North-East**

Types of pesticides	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Insecticides	100.0	92.9	88.4	87.9	90.3	99.9	101.0	103.6	119.0	138.1	129.4
Fungicides	100.0	102.6	85.7	72.2	82.7	88.1	105.5	94.5	104.0	110.5	100.9
Herbicides	100.0	114.6	105.3	96.6	115.9	188.3	183.0	176.8	176.2	152.6	189.4

Source: Calculation on data from Statistical Yearbook of Romania 2001-2010

## CONCLUSIONS

After analyzing the data above and in the context of the current economic and competitive we can draw the following conclusions from specific regional development-North east:

- the arable dropped,
- but crop yield has increased, indicating increasing the professionalism of those engaged in agriculture, which are becoming increasingly aware that a modern agriculture may be granted only if due attention throughout the agricultural technologies and take into account the area's natural conditions;

- leaving aside purely technical constraints associated with crop rotation, farmers have turned his attention to the cultivation of industrial plants, which have had an outlet yet assured before sowing,
- increasing the number of machines reported an increased degree of agriculture technology, but that may seem inefficient to a detailed account of the,
- Agriculture is an important branch of the economy in that area and it looks like that will become even more important as other industries are starting to lose ground in global and national economic development.

The agricultural potential of this region is certainly not achieved, but with the right tools and support required can become an area with a significant contribution from national economy.

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