

ANALYSIS OF THE EVOLUTION OF WINTER WHEAT AND MAIZE CROPS IN THE NORTH-WESTERN REGION IN THE CONTEXT OF ROMANIA'S INTEGRATION INTO THE EUROPEAN UNION

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Abstract

The North-Western region has a national relevance for the crop production, due to the gain brought to the oats yield, covering almost 20% of the total oat yield. Yield increase took place especially amid increasing yields per hectare, more than 30% for winter wheat and about 20% for barley and two-row barley, oats and maize.

In 2011, the counties of Bihor and Satu-Mare covered over 60% of the area cultivated with cereals for grains, about 79% of the area cultivated with winter wheat and about 56% of the area cultivated with maize. This situation of cultivated areas also describes the regional distribution of the crop production, in 2011 the county of Bihor accounting for about 42% of the cereal yield, 53% of the winter wheat yield, 46.6% of the barley and two-row barley yield and 39.3% of the maize yield.

Key words: evolution, winter wheat, cereal grains, maize grains.

INTRODUCTION

North-Western region including the counties of Bihor, Bistrița-Năsăud, Cluj, Maramures, Satu Mare and Sălaj is bordered by the Eastern Carpathians in the North-East and by the Apuseni Mountains in the South-West. North-Western region has connections with three of the other eight developing regions, having six border crossings with Hungary and Ukraine. The North-West region is characterized by a variety of landforms: mountains, hills, plains (Bors, 2007).

In 2011, the region covered an area of 3,416 hectares, representing 14.3% of the total area of the country, and ranks fourth nationally in terms of population. On January 1st 2012 the total population of the region was of 2,712,188 inhabitants, representing 12.7% of the total population of the country. The share of urban population in the total population was 53.2%, while the rural was 46.8% (www.insse.ro).

Some of the major resources of the North-West Region are: agricultural land, which represents 61.5%, and woods, covering 28.9% of the area of the region.

From the economic point of view, in 2011, the North-West region provided about 12% of the national gross domestic product (Asheim et al, 1997). In structure, agriculture of the region participates with 7.4% to the gross domestic product (Toma, 2010).

In terms of industry, it occupies a share of about 26%, higher than the national level (Giurcă et al. 2007).

The main industrial activities developed in the region are: light industry (textiles, clothing, leather and footwear), food industry (alcoholic and non-alcoholic), chemicals, machinery, chemical pulp, paper etc (Vanags, 2002). Constructions hold a share of 9.2%, slightly below the national level. Services in this region have a relevant significance, by providing over 47% of the regional domestic product (Toma et al. 2009).

MATERIALS AND METHODS

The research were performed between 2010-2012, at the Agronomy Research Laboratories, at Faculty of Management, Economic Engineering in Agriculture and Rural Development, University of Agricultural Sciences and Veterinary Medicine Bucharest.

The aim of this paper is to evaluate the impact on the production of winter wheat and maize, Romania's integration in the European Union, with particular emphasis on developments during the post-accession in the North-Western region, using data obtained from the: National Institute of Statistics, General Agricultural Censuses 2005-2010, Ministry of Agriculture and Rural Development departments, Agency for Payments and Intervention in Agriculture, and Paying Agency for Rural Development and Fisheries.

To accomplish this objective, paper needed to establish a set of indicators and a method of analysis, to quantify the influence of CAP mechanisms on the performance of agriculture (Irimescu, 2011).

The indicators selected for the assessments were structured as follows (Toma et al, 2009):

- indicators for assessing the impact of integration for the whole region - share of gross value added in agriculture in Gross Domestic Product; Gross Domestic Product per habitant;
- impact assessment indicators for the integration process of the agriculture region - dynamics of agricultural production, dynamics of gross value added in agriculture, gross value added per hectare, work productivity in agriculture, share of agricultural area cultivated / uncultivated arable surface; dynamics and structure of agricultural holdings; structure of agricultural production; dynamics of purchase prices of agricultural products;
- structure of subsidies; net added value; net income; subsidies input to the income formation. At a microeconomic level, to analyze the impact, the following indicators were calculated:

- $\text{Net Income} = Q - C + S - T - A - \text{ExF} + \text{BI}$

where: Q = production value; C = intermediate consumption, S = subsidies; T = taxes; A = amortization, ExF = external factors; BI = balance investment subsidies.

- $\text{Gross Income} = Q - C + (S - T),$

where: Q = production value; C = intermediate consumption; S = subsidies; T = taxes.

- $\text{Net Value Added} = \text{GI} - A$

where: GI = gross income, A = amortization.

For the assessment of the impact, the following have been used (Aprodu, 2006):

- absolute method of analysis of fixed-base changes and analysis of fixed-base indicators – evaluation in 2006 (and in some cases 2005) was retained as the basis of comparison to highlight the trend of post-accession period 2007-2011;
- standard deviation for evidence of regional variations compared to the national average and the counties to variances in regional media regarding financial allocations:

$$\text{Dif}(x_i) = \frac{x_i - \bar{x}}{\bar{x}} \cdot 100,$$

where: $\text{Dif}(x_i)$ – difference to average of x ; x_i – value of the indicator x to region / county; $\bar{x}$ – the average of the indicator level x country / region;

- qualitative research methods: comparison method; process consistency and differences.

RESULTS AND DISCUSSIONS

A direct consequence of the process of industrial restructuring and increasing unemployment is the emergence of the phenomenon of migration of the population from urban areas to rural areas and the increase of the share of rural population in all the counties of the region (Bârsan, 1999, Vickerman, 1999).

Currently, there are counties where population is predominantly rural (Bistrița-Năsăud 63%, Sălaj 58%, Satu Mare 53.7%).

Another effect of economic restructuring and reduction of job number is the process of migration of the population (especially the young one, among which a real exodus is manifested), the region being confronted with a veritable exodus of "gray matter" (Funck, 2003).

Numerous towns in the countryside (notably Maramureș and Satu Mare) have almost no youth, but thrive through constructions being financed from external funds (Dona, 2000).

In 2011, the North-West region provided 13% of the national gross domestic product and accounted for 13.7 percent of the country's farms, 13.6% of the cultivated agricultural area, 14% of the country's livestock (Dumitrescu et al, 2002).

The region also holds a land stock consisting of 3.4 million ha, out of which 60.6% is agricultural area and 29.96% arable area (70.86% cultivated area and 29.14% fallow land).

Analysis of agricultural exploitations and cultivated area depending on the type of cultivated crops (table 1) reveals a very significant aspect: an increase of uncultivated land. Thus, fallow land holdings have increased in the period 2005-2010 with 74.6% (about 20% of the total agricultural exploitations in 2010) and the uncultivated area with 68.6% (about 9% of the total surface in 2010).

In the five years of analysis, the share of agricultural exploitations having uncultivated area increased by 9.4 percentage points and the share of fallow land in the total surface by 4.1 percentage points (pp).

Table 1

Dynamics and structural evolution of agricultural exploitations and acreage of these types of crops, between 2005 - 2010

	Unit measure	2005	2007	2010	2010/ 2005	2005	2007	2010	2010/ 2005
		Agricultural exploitations				Cultivated area			
Utilized agricultural area	hectares	582350	529010	520620	89.40%	1941420	1962060	1808350	93.10%
Cereals grains	hectares	411670	349260	273510	66.40%	597500	540830	417820	69.90%
Share in UAA	%	70.7	66	52.5	-18.2 pp	30.8	27.6	23.1	-7.7 pp
Common winter wheat	hectares	180600	121740	60350	33.40%	197120	138220	105700	53.60%
Share in UAA	%	31	23	11.6	-19.4 pp	10.2	7	5.8	-4.3 pp
Maize grains	hectares	371180	325300	252080	67.90%	285670	309280	256110	89.70%

Share in UAA	%	63.7	61.5	48.4	-15.3 pp	14.7	15.8	14.2	-0.6 pp
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Source: based on Eurostat data, Structure of agricultural holdings 2010 and historical data (2000-2007) and INS-RGA

We can conclude that the situation in the period 2007-2010 is a direct consequence of the system of PAC subsidizing and its implementation in our country (Bidilean, 2000).

The North-West region provides about 12% of the maize yield and about 10% of the winter wheat yield. Yield increases took place especially on the background of increasing yields per hectare, with more than 30% of winter wheat and about 20% of maize (table 2).

Table 2

Agricultural production and average yield for main crops grown in the North-West region in the period 2006-2011

	Indicator	Unit measure	2006	2007	2008	2009	2010	2011	2011/2012 %
Cereals grains	Total production	tons	1538002	1340969	1630802	1164485	1606069	1692468	110.0
	Average production	kilo/hectare	3081	1523	3229	2815	3316	3989	129.5
Winter wheat	Total production	tons	395962	321188	42877	277561	339408	434917	109.8
	Average production	kilo/hectare	2746	1541	3403	2421	2688	3663	133.4
Maize grains	Total production	tons	945305	858027	1009247	7359 23	1096326	1060818	112.2
	Average production	kilo/hectare	3565	1526	3215	3409	4309	4525	126.9

Source: based on Eurostat data

The average prices of the main agricultural products purchased by economic operators (calculated as balanced arithmetic average of prices recorded at the channel level, they reflect the first stage of marketing - direct purchases from growers - and do not include transport and storage costs, subsidies on products and VAT) have had an increasing trend both in nominal and real terms (table 3). The largest increases were recorded in plant products, especially of winter wheat, on the background of the international prices developments (Armstrong et al, 2000).

Table 3

Dynamics of nominal and real purchase prices of the main crop productin in North-West region in the period 2006-2011

	Unit measure	2006	2007	2008	2009	2010	2011	2011/2006 %
Nominal prices								
Winter wheat	lei/kilo	0.25	0.62	0.6	0.43	0.63	0.94	376
Maize grains	lei/kilo	0.36	0.54	0.7	0.51	0.59	0.85	236.1
Real prices								
Winter wheat	lei/kilo	0.25	0.62	0.6	0.43	0.63	0.74	295.8
Maize grains	lei/kilo	0.36	0.54	0.7	0.51	0.59	0.67	185.8
Share prices in the North West in the country prices								
Winter wheat	%	73.5	101.6	90.9	91.5	106.8	106.8	-

Maize grains	%	120	98.2	97.2	106.3	103.5	107.6	-
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Source: based on Eurostat data

Compared to the purchaser prices of agricultural products recorded at the country level (table 3), it is noticed that for some products, prices in the North-West region were higher than the country average (Frandsen et al 2002).

In 2011, the counties of Bihor and Satu-Mare held 60% of the area cultivated with cereals for grains, about 79% of that with winter wheat and about 56% of the area cultivated with maize.

This situation of cultivated areas also defines the regional distribution of crop production (table 4).

Thus, in 2011 Bihor county held about 42% of the cereal production, 53% of the winter wheat production and 39.3% of the maize production.

Satu Mare county concentrated 25% of the cereal production, about 29% of the winter wheat production and about 23% of the maize production.

Table 4

Structure of the main crops cultivated by component counties of the North-West region in 2006 and 2011

	Unit measure	Total cultivated area			Winter wheat			Maize		
		2006	2011	2011/2006	2006	2011	2011/2006	2006	2011	2011/2006
NorthWest region	hectares	798329	725261	90.80%	142679	120130	84.20%	251281	239673	84.20%
Bihor	hectares	258218	248493	96.20%	57888	58784	101.50%	82881	80562	101.50%
County / Region	%	32.3	34.3	1.9 pp	40.6	48.9	8.4 pp	33	33.6	8.4 pp
Bistrița-Năsăud	hectares	77621	68629	88.40%	7922	4742	59.90%	26994	25326	59.90%
County / Region	%	9.7	9.5	-0.3 pp	5.6	3.9	-1.6 pp	10.7	10.6	-1.6 pp
Cluj	hectares	127006	99161	78.10%	18420	11225	60.90%	38172	36568	60.90%
County / Region	%	15.9	13.7	-2.2 pp	12.9	9.3	-3.6 pp	15.2	15.3	-3.6 pp
Maramureș	hectares	73805	68895	93.30%	6836	3214	47.00%	21410	18809	47.00%
County / Region	%	9.2	9.5	0.3 pp	4.8	2.7	-2.1 pp	8.5	7.8	-2.1 pp
Satu-Mare	hectares	168276	167514	99.50%	36059	36242	100.50%	56324	54230	100.50%
County / Region	%	21.1	23.1	2.0 pp	25.3	30.2	4.9 pp	22.4	22.6	4.9 pp
Salaj	hectares	93403	72569	77.70%	15554	5923	38.10%	25500	24178	38.10%
County / Region	%	11.7	10	-1.7 pp	10.9	4.9	-6.0 pp	10.1	10.1	-6.0 pp

Source: based on Eurostat, Tempo available online la www.insse.ro

CONCLUSIONS

During post-accession period (2007-2011), the North-West region has seen a growth towards pre-accession period, with a slight decrease in 2009 amid the economic crisis registered nationally and worldwide.

In 2011, regional GDP, expressed in nominal terms, had increased with 64.5% compared with 2006

According to the General Agricultural Census (GAC), in 2010 agricultural holdings in North-West region accounted for 13.7% of agricultural holdings of the country and held 13.6% of the agricultural area in use.

They have seen a sharper drop in 2005-2007 (10.7%) than in the period 2007-2010 (with only 1%).

In 2011, the North-West region held a land stock of 3.4 million ha, out of which 60.6% agricultural area and 29.96% arable area. From the total arable area, 70.86% was cultivated and 29.14% was fallow land. But in the period 2007-2011, the fallow land increased by 36.8%, while in 2009, with the deepening of economic crisis, it had reached a level higher with 41.7% compared to 2006.

The North-West region has a national relevance for the crop production, due to the gain brought to the oat yield, covering almost 20% of the total oat yield. Yield increase took place especially amid increasing yields per hectare, more than 30% being with winter wheat and about 20% with barley and two-row barley, oats and maize.

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Satu Mare county accounts for 25% of cereal yield, about 29% of the winter wheat yield and about 23% of the maize yield.

All this proves a generally positive evolution of Romanian agriculture during post-accession.

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