

## THE GLOBAL WARMING – A POSSIBLE DECREASE FACTOR OF VEGETABLE PRODUCTION (CASE STUDY IN ORADEA'S SURROUNDING AREA)

Alina MOȘOIU<sup>1</sup>, Elena GÎNDU<sup>1</sup>,  
Anca-Iulia DUDAȘ<sup>3</sup>

<sup>1</sup> Oradea University

<sup>2</sup>University of Agronomy Sciences and Veterinary  
Medicine of Iasi

e-mail: egindu@univagro-iasi.ro

*Most scientists consider that in present are combined all the symptoms to be able to consider that global warming affects both our country and the studied area. They argue that the daily human activities affect the climate through the use of fossil fuels (oil, coal and natural gas) for energy and transport, being responsible for strong storms, floods, droughts and heat waves.*

*Because of the greenhouse gases already emitted into the atmosphere in decades, the temperature may increase by 1.2 to 1.3 ° C, and to avoid irreversible damage to the planet, the temperature of the Earth's surface must not increase by more than 2 ° C above pre-industrial level.*

*Romania's agricultural resources constitute the most important basis for the practice of agriculture aligned to European Union standards. The volume, structure and use of these resources require a series of changes to ensure the strengthening of market economy functioning.*

*Agricultural policies recommended don't impulses enough the forming of competitive structures of resources's exploitation, not having the impact expected in the single market.*

*These aspects are present also in the Oradea's surrounding area, which justifies the pursuit of development of vegetable production in the period 2004-2007 to see if changes have occurred resulting from global warming to the environment.*

*In Bihor county the existing agricultural potential will contribute to the development in the future of vegetable production. Instead, at the level of Oradea's surrounding area we assist to some changes determined by the degree of concentration of industry. Nevertheless, the agricultural potential of the studied area is a important and effective source to assure the local population with agricultural products.*

*The relief, climatic conditions and experience of the inhabitants of the Oradea's surrounding area, have positively influenced the vegetable production from the analysed period.*

*Nevertheless, because of drought, during 2006 and 2007, average productions per hectare achieved in grain cereals were inadequate. Instead, at the sugar beet, potatoes and sunflower, the cultivated area has been increasing both in Bihor county level and in the researched area.*

**Key words:** development, agriculture, marketing, production, globalization

Economically the EU report concerning the consequences of global warming, on the environmental security points out that melting arctic glacier could make exploitable natural resources like fishing or natural deposits of gas and oil, which are currently locked in frozen continental platform. This could generate differences between Russia, the United States, Canada, Norway and Denmark.

On agriculture, a time was believed that global warming has beneficial effects due to the increase in CO<sub>2</sub> concentration assimilable through photosynthesis.

The increasing temperatures allowed the cultivation of plants in places where it was not possible, for example, barley cultivation in Iceland.

One effect of global warming led to the extension of the period of plant vegetation, and the fact that they multiply more rapidly, gave the possibility of expansion of some plants in areas that normally would not be able to cultivate.

In the preliminary report of the UNO, which was published on 2 April 2007, it is shown that the period of plant vegetation has been extended because of increased temperatures.

Like this, it is very possible that the periods of plants flowering to be repeated several times in the same year, a phenomenon that already happened in Romania, when close to mid-November the dandelions were bloomed on the fields around Bucharest.

The same happens in the south area of Northland, where the beeches and birches, which don't blossom every year, grow more vigorous and tend to open their flowers annually.

Although in some places, for example, in Siberia, heating is favourable, in others, for example, in Africa, it has dramatic effects because it contributes to the expansion of Sahara desert over the Sahel.

## MATERIAL AND METHOD

The study was effectuated in Oradea's surrounding area and had as object making evident some indicators concerning the development of agriculture in the studied area.

The methodology used is specific to the European Union being directed towards the achievement of random statistical research. This method combines remote sensing techniques to direct research in the field.

Statistical research is selective and based on random samples.

The main variables investigated for the Oradea's surrounding area refer to the following:

- the evolution of temperature in the Oradea's surrounding area;
- the realized production at the main cultures;
- the average yield per hectare in searched area.

The sample type is that stratified on localities, legal status of agriculture exploitations and the size of used agricultural areas and number of animals held.

The sample used was 1,000 farms, of which 100 with legal personality and 900 individual holdings (peasant households).

## RESULTS AND DISCUSSIONS

The addressing of the aspects concerning the effects of climate change on agriculture is a priority objective in the strategic development actions of member countries of the EU.

Interdisciplinary nature of the actions involves a holistic approach by identifying and correlating the development activities and implementation of measures intra and inter- sectoral with those connected by the effects of climate change in agriculture and related fields.

The vegetable production varies from one year to another, being significantly affected by fluctuations of climatic conditions and specially by the production of extreme weather events.

The climatic variability influences all sectors of the economy, but the most vulnerable remains agriculture. This mutual impact is more pregnant now because changes and climate variability is manifested increasingly stressed.

In Oradea's surrounding area effect has been felt by the population through the prism of temperature increase, a phenomenon which may have negative influence on the agricultural production in this area (*tab. 1*).

Table 1

**The air temperature in the 2004-2007 agricultural year (after the Oradea's Meteorological station )**

Agric. year	X	XI	XII	I	II	III	IV	V	VI	VII	VIII	IX
2004	8,6	7,6	0,5	-2,7	0,9	5,6	11,9	14,7	19,3	21,8	20,4	15,1
2005	12,3	5,8	2	-0,5	-3,6	2,6	11	16,5	18,3	21,3	19,8	17
2006	11	4,2	0,7	2,2	0,9	2,7	12	15,9	19,2	23,2	19,1	17
2007	11,2	6,6	2,3	4,3	4,7	8,7	12,2	18,2	22,2	23,6	22,3	14,4
multian average	<b>10,4</b>	<b>5,3</b>	<b>0,6</b>	<b>-2</b>	<b>0,3</b>	<b>5</b>	<b>10,4</b>	<b>15,8</b>	<b>19</b>	<b>20,8</b>	<b>20,3</b>	<b>16,2</b>

As you can see the temperature is rising from one year to another, even if in a month in some years it does not fit this trend. Multiannual average is the average of 1931-2005 years, and is used as a basis of comparison with the rest of the years.

The ponderosity of the vegetable production from the total value of agricultural production has fluctuated from one year to another but remain somewhere between 50 and 60%. Private sector is the most important and the proportion in the total value of production is over 90%. The annual fluctuations of vegetable agricultural production is primarily attributable to weather conditions to which the Romanian farmer is quite vulnerable.

The relief, climatic conditions and experience of the inhabitants of Oradea's surrounding area have determined in higher vegetable productions in the analysed years. Due to climatic factors, particularly the drought in 2006, there were average production per hectare less than usually. But the situation was similar and the year 2007 at the same cultures. At the sugar beet, potatoes and sunflower, the area under cultivation is rising across the county due to pedo-climate favourability for these cultures in the studied area.

The structure of agricultural production in Oradea's surrounding area is dominated by the cultivation of cereals because of chernozem in this part of the country, carrying out agricultural work on time, respecting the recommendations of scientific research institutes on the varieties and hybrids use, culture rotation that gave a production per hectare in bigger. Here we remark large ponderosity of wheat and maize.

The second position in the structure of agricultural vegetable production is owned by the undergroup of oleaginous plants. The explanation lies in that exist in the city of Oradea an oil factory. Although as surface the ponderosity at sunflower is reduced, the average production per hectare is high.

At soya, in the last years has remarked a tendency of growing at surfaces.

During the examined period the culture of sugar beet remains balanced and as a result of subsidies granted. In the Oradea's surrounding area, vegetables and potato falls in the group complementary cultures (*tab.2*).

However, in this area prevails the vegetable growers because vegetable products are more easily commercialized in the markets of the city of Oradea, in detrimental of potato, which is cultivated mainly for personal consumption, Bihor county not having very favourable conditions for growing potatoes.

The largest area is filled with vegetables which are in the vegetable basin Oradea - Borș - Cetariu (390 hectares) and Sântandrei (30 hectares).

The grape-vine is cultivated with predilection in the vineyards from Cetariu (hybrids) and Biharia (wine grapes - Royal Fetească varieties, italian Riesling, Muscat Ottonel, Musc at Hamburg, etc.).

Culture of fruit trees is well represented in this area.

For example, the apple is dominant in the orchards from Oradea, and Biharia Paleu, the pear-tree, apricot-tree and peach-tree in Oradea and Paleu, plum-tree in Oradea and Cetariu, cherry-tree and morello in orchards from Oradea and Biharia and walnut in Oradea's area.

## CONCLUSIONS

1. In Oradea's surrounding area was a restraint of agricultural land in favour of intravilane.

2. The evolution of researched areal highlights the evident trend towards non-agricultural activities against agricultural activities

3. One consequence of damage recorded in the agriculture of Oradea's surrounding constitutes the extremely reduced ponderosity of the insurance of agricultural production

Table 2

**Vegetable agricultural production achieved in the Oradea's surrounding area, in the period 2004 - 2007**

Nr. crt.	Culture's denomination	Vegetable agricultural production (tone)			
		2004	2005	2006	2007
Cereals grain					
1	Wheat	75359	74125	72448	71237
2	Tye	1311	1283	1190	1254
3	Barley and two-row barley	16103	15285	14348	13278
4	Oat	8037	7594	7182	7043
5	Corn grain	110081	100667	94620	93326
Leguminous grain					
1	Pease	13	13,5	14,1	13,7
2	Kidney bean	54	54,2	55	54
Oleaginous plants					
1	Sun flower	11756	12018	12455	13574
2	Soya	785	703	640	627
3	Rape	110	103	91	93
4	Sugar beet	15433	13874	12258	13794
5	Tobacco	50	50	50	50
6	Potatoes	47684	44063	40144	40357
Vegetables					
1	Tomatoes	4783	4829	4901	4857
2	Cabbage	2742	2816	2934	3049
3	Watermelon and melon	1912,75	1731	1723	1694,3

4. As a result of atmospheric instability in recent years and increasing the frequency of natural disasters, vegetable agricultural production had a trend of reduction, with negative consequences on the income and standard of living of farmers in the studied area.

Table 3

**Average production per hectare achieved at the main cultures in Oradea's surrounding area, in the period 2004-2007**

Nr. crt.	Culture's denomination	Average production at ha (kg/ha)			
		2004	2005	2006	2007
1	Wheat	2965	2874	2887	2970
2	Rye	2357	2475	2243	2379
3	Barley and two-row barley	1923	1874	1893	1920
4	Oat	1850	1743	1724	1795
5	Corn grain	4034	4223	4140	4207
6	Pease	1879	1775	1775	1820
7	Kidney bean	1103	1017	1120	1079
8	Sun flower	1500	1579	1620	1634
9	Soya	2186	2017	2170	2000
10	Rape	1523	1630	1532	1474
11	Sugar beet	28932	26324	25439	25874
12	Tobacco	1032	1032	1032	1032
13	Potatoes	12038	12000	12124	11984
14	Tomatoes	13271	13549	13650	13473
15	Cabbage	16904	16347	16129	15934
16	Watermelon and melon	12435	11274	12523	12500

Table 4

**The production of grapes and fruit achieved in the metropolitan area  
city of Oradea**

Specification	Total production- tone	From which : privat propriety- tone
Grapes– grape-vine	3.456	3.456
Fruits	14.522	14.518

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