

Economics of agriculture

SI – 2

UDK: 631(497.7)

## REGIONAL SPECIFICS OF MACEDONIAN AGRICULTURE

*Boris Anakiev, Romina Kabranova, Zlatko Arsov<sup>1</sup>, Slavica Mihajlovska<sup>2</sup>*

### Abstract

*Macedonia is located on the Southern Continental layer of the moderate and Subtropical zone borders. Geographical location, relief, near the Aegean Sea, the openness of the river to the sea, are giving the possibility of presents of three continental zones with: Mediterranean climate, Continental climate and Mountain climate. Variety of eco conditions as well as geographical position are providing relatively wide assortment of agricultural crops to be grown on the territory of Macedonia. Specific characteristics of certain regions give the specific assortment in a certain areas. The most of agricultural area (25% arable land, orchards an number of cattle) has region of Pelagonia. The biggest agricultural area are under vineyards placed in the South-Eastern region. The analysis shows that the vegetable is represented mostly in the East-Southern region and the region of Skopje. The wheat are represented the most in the region of Pelagonia, while the apple trees are represented with 66,7% in the area of Resen (also in the region of Pelagonia). The last couple of years, except some new types of vegetable crops, in Macedonia has been expanded the production of flowers and take about 30% from total agricultural area in the region of Polog.*

**Key words:** *regions, agriculture, crops, territory, natural conditions.*

### Introduction

Modern economic development in general, and particularly agriculture, dedicate a great attention to regionalization, because of the relatively large difference levels of development of certain regions over others or in relation to the average values of economy of the country, as well as opportunities and a better insight into the potential use of certain

---

1 D-sc Boris Anakiev, regular professor in retirement, Bul Jane Sandanski 98-1/10, Skopje Makedonija; M-sc Romina Kabranova, assistant, Faculty of Agricultural Sciences and Food - Skopje, rkabranova@yahoo.co.uk; D-sc Zlatko Arsov, professor, Faculty of Agricultural Sciences and Food - Skopje

2 M-sc Slavica Mihajlovska, Ministry of Agriculture, Forestry and Watersupply in RM, Skopje, Macedonia.

regions, but also the orientation of the economy poorly developed regions, greater financial and other assistance to the state.

Republic of Macedonia was officially divided into eight regions, each with certain specific features as these are the geographic regions with different natural conditions in a region where not great natural difference. Some of the regions referred to as the economic, as well as other statistics, and in fact have both, because it keeps official statistics at the municipal level, and each region consists of a number of municipalities as a whole.

Although relatively small in territory, Macedonia, under the influence of climate and terrain there are formed relatively differentiated natural conditions, which allow for successful breeding of a wide range of agricultural crops of all so-called Continental to Mediterranean and those which are grown in mountainous conditions.

Macedonian agriculture is a very important economic sector, which has been poorly developed because of the relatively weak industry and services, participate very high (compared with developed countries) in gross domestic product with 10.96%. Some regions in the GDP from agriculture involved very different, from: 1.6% in the region of Skopje, where they concentrated on other economic sectors, and up to 41.8% in the South-eastern region with areas of Strumica, Valandovo, Gjevgjelija, where they represented an intensive agricultural systems, such as vegetable growing and vineyards.

### **Data sources**

Largest source of data derived from census of agriculture in Macedonia in 2007, which includes all municipalities, and the data processed at the level of region. Then we used statistics from the Bulletin no. 621 – Field production, Orchard and Vineyard production, and publication of the National Bureau of Statistics under the heading: “Regions of the Republic of Macedonia in 2009”.

The data in these sources are usually represented as absolute indicators, we have calculated in relative ratio to the needs of this work, according to the conception of the author.

### **Indicators of the capacity region**

Regions with large mutual differences on many indicators: by territory (area) the largest is the region of Pelagonija, by number of inhabitants the largest is the region of Skopje, by density after Skopje, with the most densely population is the region of Polog etc.

*Table 1 - Some important indicators of the region, 2009*

<b>Regions</b>	<b>Area, 000 km<sup>2</sup></b>	<b>Number of inhabitants 000</b>	<b>Population density inhabitants / km<sup>2</sup></b>	<b>Number of municipalities</b>	<b>Number of municipalities residence in the village</b>
Pelagonija	4,7	236	50	9	4
Vardar	4	154	38	9	4
North- eastern	2,3	174	75	6	3
South- western	3,3	222	66	13	8
Skopje	1,8	590	319	17	7
South- eastern	2,7	172	63	10	5
Polog	2,3	310	126	9	7
Eastern	3,5	181	51	11	3

The number of municipalities that are within the region ranges is from 9 to 17 municipalities, and nearly half of the total 84 municipalities are located in villages. As for the relationship of rural and urban residents, it was: 43.3% rural population and 56.7% urban population, but 43.3% of residents who live in villages, about 11% at the level of Macedonia is an agricultural population.

### **Participation in major regional capacity**

As the level of the overall economy, as well as in agriculture, distribution, manufacturing capacity with large differences by region. This has resulted in uneven development and the large differences which can be seen from the actual share of GDP by region in total GDP, which is from 6,5% in the Eastern region to participate with 48.5% in the region of Skopje.

So far almost nothing specifically does not happen in Macedonia, both at the level of the overall economy and in agriculture to reduce differences in development.

Disposal of larger facilities does not always mean better results, so it is important how the facilities used by or for agriculture in general, that the agricultural sectors of agricultural area used (Tab.2). The region of Pelagonija has the largest agricultural areas, which means arable land, orchards, meadows and pastures, but with a relatively small part in the vineyards available. Usage of agricultural land, to be anticipated in the global view in which the region the most exponent individual products. So it is obvious that the vineyards in the region of Vardar are the most exponent (Kavadarci, Negotino), that the growing fruit is with the highest participation in the region of Pelagonija, because Resen belongs to, etc.

*Table 2 - Regional participation in the management of agricultural land  
(census of agriculture, 2007) %*

Regions	Agri-cultural land	Plough-land & Gardens	Orchards	Vineyards	Meadows	Pastures
Pelagonija	25,5	22,6	28,1	5,4	23,4	28,1
Vardar	10,2	10,4	6	44	2,5	9,5
North-eastern	13,6	15,2	6,9	7,2	19,0	12,3
South-western	9,7	9,6	15,8	2,8	12,2	9,7
Skopje	6,2	7,5	5	9,3	6,6	4,9
South-eastern	8,5	11,6	7	23,4	3,6	6,2
Polog	15,9	7,4	8,3	0,2	19,4	23,1
Eastern	10,7	15,7	22,9	7,7	13,3	6,2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

As for the number of livestock (Tab.3), as one of the basic capacity in agriculture, the differences are relatively small in cattle except between Pelagonija with the highest share of 21.2% and the region of Vardar with 4.8%.

In the case of sheep, the highest share has Eastern region, as well as involvement of the goats despite the low share of available pasture.

*Tab.3 Regional participation of livestock (census of agriculture, 2007), %*

Regions	Cattle	Sheep	Goats	Pigs	Poultry
Pelagonija	21,2	17,5	8,4	12,7	20,3
Vardar	4,8	8,5	7,2	3,9	6,8
North-eastern	12,6	9,6	14,6	16	15,3
South-western	9,8	13,8	10,2	5,9	8,4
Skopje	10,3	5,7	6,3	6,4	5,6
South-eastern	10,8	9	18,9	9	19,1
Polog	18,3	12,5	6	7,1	12,1
Eastern	12,2	23,4	28,4	39	12,4
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

An important requirement for agricultural production is available tractors, as the most important part of the mechanization of agriculture. Because of the relatively small holdings of individual farmers in Macedonia, for a long time shows irrational used of the tractors. So, now average size of agricultural land per tractor is 4.4 ha, the smallest in the region of Polog with only 2.7 ha, in the region of Skopje with 2.9 ha, and the largest in the North-eastern region with 5.7 ha, than, in the Eastern region with 5.6 ha, in the region of Pelagonija with 5.5 ha and in the region of Vardar with 5.4 ha.

Of the total number of individual farms, the largest percentage of has the Eastern region 16.8%, minimum of has region Skopje and the Vardar region of 9.8%. Of the

total number of “business subjects” (as appointed by stats) also the highest number is in the Eastern region, at least in the region of Skopje. Pulverous surface show data in all regions over both agricultural land per farm. Thus, at the level of Macedonia, a farm has only 1.67 ha of individual farmers, and 257.3 ha per business entity. The largest area per farm is North-eastern region of 2.38 ha, and in business subjects the region of Pelagonija from 423.0 ha in one subject.

### The participation of the region in the use of arable land and garden

The largest area of arable land and garden (25%) belong to the region of Pelagonija that includes Pelagonija, relatively the largest plain in Macedonia, then the Eastern region, where are the plain part of the Ovce Pole and Kočansko Pole, while the lowest participation have South-western region (which belong to the Ohrid and Kičevo, 5.3%) and the region of Vardar (Kavadarci and Negotino with 6.2%).

From this information can be finding out which confirm the data by region in the areas of participation by group of crops. Shows that dominate the area under wheat in Pelagonia and Ovce Pole (Eastern region).

Then the industrial crops with the greatest participation also in the region of Pelagonija (tobacco in Prilep’s field and sunflower in Bitola’s field), but as well with high participation in the South-eastern region dominated by tobacco (Strumica and Radovish). In recent years, except tobacco, which shows a trend of increase and the sunflower, whose surfaces are very low, other industrial culture have a symbolic representation of the structure of sowing (poppy and sugar beet) or disappeared (cotton and sesame).

*Tab.4 Share of the region in the use of arable land and garden  
(census of agriculture, 2007), %*

Regions	Total area of using surface	Used method of using surface				
		Grain	Industrial crops	Fodder	Vegetables	Flowers and ornamental plants
Pelagonija	25,2	24,2	57,7	20,2	13,3	9,7
Vardar	6,2	5,3	4,3	4,2	6,2	7,9
North-eastern	14,9	18,2	3,5	8,3	9,2	5,3
South-western	5,3	5,2	0,2	12,9	4,3	9,8
Skopje	8,2	7,6	3,4	9,5	14,1	13,7
South-eastern	12,5	8,6	22,9	15,5	29,5	15,6
Polog	8	7,7	0,5	17,2	9,1	30,1
Eastern	19,7	23,2	7,5	12,2	14,3	7,9
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

The region of Pelagonija has the highest participation and the surface forage crops because of the relatively high representation of livestock-mostly cattle, while other EP 2010 (57) SI – 2 (29-37)

regions have generally forage crops represented by participation in the total number of cattle. The South-eastern region has 29.5%, the biggest area with vegetables, followed by Eastern region and the region of Skopje with slightly over 14%. While the first two regions known for growing vegetables for the convenience of natural conditions, the region of Skopje, no such benefits, however, to encourage a high vegetable consumer-center, Skopje.

Growing flowers and ornamental plants engaged in more growing area because it sometimes provides higher income than the agricultural crops, for which even state land was given in the concession (foreign companies) for the cultivation of perennial and ornamental plants in the relatively densely populated region (Polog) with excellent conditions for vegetable crops.

Therefore, this region has the highest participation in the areas under flowers and ornamental plants (30.1%), but in other regions, many small farmers have started to deal with this production because it is high labor and suitable in the conditions with a high percentage of unemployment, such as Macedonia.

### **Regional participation of important areas cultures**

The limited space does not permit to show all crops participation by region, so we only limit on the most important for the national agriculture with emphasis on the characteristic of Macedonia. Wealth growing range of cultural plants in Macedonia has been reduced in recent years to nearly twenty crops. In sowing structure can not meet today, and some by which Macedonia was once known, such as cotton, sesame, poppy, anis, chickpeas, hemp, etc.. But today assortment of field and vegetable crops, which are followed by statistical information reaches thirty crops and fifteen types of fruit plants, and all that as a result of different and specific environmental conditions and traditions in the production.

**Wheat.** Because of the arid climate, its main grain yield (except rice) are not competitive in the market, which is why the import of grain and grain products in Macedonia a year spent twenty million dollars. But wheat has an important role because its production deal with most of the small farmers, as subsistence production for nourishment manufacturers themselves.

The largest area under wheat are located in the region of Pelagonija where natural conditions allow achieving over average yield, then the Eastern region with the largest territory of the Ovce Pole, with relatively dry conditions and the lowest yields (Tab.5).

**Industrial crops.** As stated previously, from the field of Macedonia disappeared more important types of crops including the largest number of industrial crops, from which the importance is only of tobacco and sunflower. Dominate the area under sunflower in Bitola part of the region of Pelagonija, while tobacco is dominant in the part of Prilep, the region of Pelagonija, but a significant percentage of tobacco surface participates in the South-eastern region.

**Forage crops.** In the statistics of Macedonia is registered the relatively narrow range of fodder for cattle feeding and insufficient for domestic needs which is why Macedonia is a permanent importer of animal feed.

While alfalfa is represented with a relatively equal participation in the five regions, falling corn is the dominant part in the region of Pelagonija.

*Tab.5 participation of major culture areas by region (census of agriculture, 2007), % (Total area per culture = 100)*

Major crops	Pelagonia region	Vardar region	North-East region	South-western region	Skopje region	South-eastern region	Polog region	Eastern region
Wheat	27,1	4,9	17	5	7,7	9,3	6,5	22,5
Other grain (except wheat, barley and corn)	30,6	1,8	24,7	3	6,4	3,9	2,6	27,1
Sunflower	68,3	0,3	11,5	0	3,5	6,1	0	5,5
Tobacco	58,8	5,1	0,2	0,1	2,9	28,6	0,2	4,1
Alfalfa	19,7	2,6	1,9	17	3,8	18,7	23,9	12,4
Falling corn	68,7	0,4	6,2	1,3	2,3	9,6	1,5	10
Tomato	11	5,3	9,5	4,2	16,4	35,2	11	10,1
Pepper	22,2	7,7	5,7	3,1	7,1	34,5	9,1	10,6
Beans	14,2	5,9	14,2	7,5	11,3	11	12,8	23,1
Potato	10,5	5	13,9	7,7	14,2	10,8	12	25,9
Watermelon	8,4	4,9	9,1	0,4	20	49	2,4	5,8
Apple	66,7	2,4	3,5	12,1	1,9	2,7	6,5	4,2
Pear	8	9,8	23	10,6	11,6	8,5	12,7	15,8
Apricot	3,3	23	18	2,2	15,2	23,4	3,3	11,6
Peach	2,2	72,7	2,8	1,1	8	10,6	0,7	1,9
Vineyard	3,8	48,2	6,3	1,6	5,3	24,9	0,4	9,5

**Vegetables.** Because of the importance of this production for the export of Macedonian agriculture, the importance is to look at any participation of vegetable crops by regions. In addition, we note that all the vegetables has been grown for natural consumption.

However, with tomatoes, peppers and watermelon, is dominated by participation in the areas in the South-eastern region, the largest share of beans occurs in the Eastern region, and then the region of Pelagonija and South-eastern region, which is close to the participation of beans in the region of Polog. Potato has the highest participation in the Eastern region, and than in the North-eastern region.

**Fruit.** In Macedonia, the apple is represented with the largest areas in comparison to other types of fruit. The greatest percentage of area represented by region is shown in the region of Pelagonija, where the area of Resen is well known by apples, but once known area of Tetovo (region of Polog) by the surface, has been without a significant despite very favorable conditions. In apricot (whose area the last year significantly reduced), the highest share have the region of Vardar and South-eastern region, while the peaches dominates the region of Vardar, where belongs Rosoman, an area very well known for production of peaches.

**Vineyards.** The region of Vardar has nearly half the area under vineyards, occupying one-fourth of the area in the South-Eastern region, while in other regions the participation part of the vineyards is symbolic.

### Conclusion

Based on the text above, several conclusions and recommendations can be present:

- Under the influence of climate, terrain and other natural conditions, in the Republic of Macedonia differ a number of areas with specific requirements for growing agricultural crops. Global regional analysis of on a level of official region of Macedonia shows that the conditions are not rationally used, because the last years some important crops are no longer in range or represented in such an extent that they are not statistically relevant.
- Macedonia is statistically divided into eight regions, each with different indicators. By territory (area) the largest is the region of Pelagonija, with 4.7 thousand square kilometers, by number of inhabitants the largest is the region of Skopje and according to density, after the region of Skopje, follows the region of Polog.
- Participation of the regions in important capacities is different. The region of Pelagonija has the largest agricultural areas (25.5%), that means fields, orchards (28.1% as belonging to the Resen), the meadows and pastures, but with a relatively small share in the disposal of the vineyards (5.4%). It is obvious that the vineyards are the most frequent in the region of Vardar (44%).
- The number of livestock, as one of the basic capacity in agriculture, the differences are relatively high in cattle between the region of Pelagonija with the highest share of 21.2% and the region of Vardar with 4.8%. Among sheep, the highest contributor is the Eastern region (23.4%), as well as the participation of goats (28.4%) despite the low participation in available pastures.
- The most usage of arable land and garden area (25.2%) belongs to the region of Pelagonia, then to the Eastern region, where belong the Ovče Pole and Kocansko Pole, while the lowest participation have South-western region (5.3%) and the region of Vardar (6.2%).
- Analysis of the participation of regions in the areas by groups of culture show that dominate the area under wheat in the region of Pelagonia (24.2%) and the Eastern region (23.2%). Industrial cultures with the greatest also in the region

of Pelagonia (57.7%), but with high participation and the South-eastern region dominated by tobacco (22.9%). The largest contributor in area of fodder crops is the region of Pelagonija (20.2%) due to the relatively high prevalence of livestock-mostly cattle. The largest area with vegetables has the South-eastern region, 29.5%.

- Global analysis of official regional-level in Macedonia indicates that conditions are not rationally used, because in recent years some important crops are no longer represented in the assortment or they are represented in such a volume that is not statistically relevant.
- Research and analysis in the field of regional convergence should direct range over a wider area in order to comprehend the specific conditions of the narrow areas to expand the production that enable better results thanks to new varieties, which could acclimatize to unfavorable conditions.

### **Literature**

1. Macedonian Academy of Sciences and Arts, 2001. The strategy for the development of agriculture of the Republic until the year 2005. MANU, Skopje.
2. State Statistical Office of the Republic of Macedonia, 2008. Bulletin 621, SSO, Skopje.
3. State Statistical Office of the Republic of Macedonia, 2008. Census of Agriculture, 2007, Book I and II, CBS, Skopje.
4. State Statistical Office of the Republic of Macedonia, 2009. Regions in the Republic of Macedonia. SSO, Skopje.
5. Statistics annual the NRM, 1954. Statistical Office of the NRM, Skopje.