

Competitiveness of Economy of **Vojvodina**

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Competitiveness of Economy of **Vojvodina**

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LEGAL FRAMEWORK OF THE AP VOJVODINA

COMPETITIVENESS OF VOJVODINA: FINDINGS AND RECOMMENDATIONS

Competitiveness of Economy of **Vojvodina**

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AGRICULTURE

4.1 Introduction

Agriculture in the AP Vojvodina experienced its peak growth in the 1980's. During 1990's, however, the agricultural sector experienced a significant downturn from which it has not recovered to date. Future development of Vojvodina agriculture may be directed to recovering positive output and productivity from 1980', but this task would be very slow if investments were to be made in the development of conventional agriculture.

Investigations carried out in this Study include the analysis of available capacities (agricultural population, land use potentials, irrigation possibilities and livestock units), production parameters (area, yield and total output), principal field and vegetable crops (corn, wheat, soya, sunflower, sugar beet, beans, potato), and livestock products (meat and milk), as well as conditions and output and productivity of Vojvodina agriculture in the period from 2001 to 2007.

Based on the results of quantitative and qualitative analyses, competitive position of agriculture in Vojvodina has been identified. In the following stage, the development concept and strategy for enhancing competitiveness of agro-industrial complex of Vojvodina has been formulated.

Real potentials for accelerated development of agriculture in Vojvodina and strengthening of its competitive position are seen in the multifunctional development. This means that a part of agricultural resources will be utilised in a conventional manner, through intensification of agricultural production until reaching sustainable development threshold, another part shall be utilised for non-agricultural purposes (agro-eco, hunting, fishing, sports-recreation tourism, catering and other services and renewable energy production), while the remaining part shall be used for Manufacture of organic and healthy safe food.

The term multifunctionality as used in this Study denotes total non-conventional agriculture (Manufacture of healthy safe - organic food) and conventional agriculture (Agriculture carried out in a traditional manner and for traditional purposes – Manufacture of food and inputs for Manufacturing sector), and non-conventional purposes (bio-mass for energy generation). The term multifunctional agriculture as used in the EU referred to Manufacture of food and other inputs having no market price, i.e. the production subsidised in the broader interest of society. This is the production that brings economic benefits to the producers and environmental and social benefits to the society and the state. In that sense, Vojvodina agriculture is multifunctional, regardless of its transitional downturn. Considering new opportunities in the market (renewable energy resources, tourism, leisure and recreation, services), use of agricultural resources may be even more diversified in order to increase economic effectiveness, without jeopardising its multifunctionality.

4.2 Analysis of resources

4.2.1 Population

In the period between two Censuses, the agricultural population declined for over one fifth (Table 4.2.1). Agricultural population has been decreasing dynamically, at the average annual rate of -2.02%.

Table 4.2.1. Changes in agricultural population in Vojvodina and Serbia (according to Censuses from 1991 and 2002)

Category	1991			2002			Change [%]	
	Vojvodina	Serbia	%	Vojvodina	Serbia	%	Vojvodina	Serbia
Agricultural	269	1,305	21	215	817	26	-20.15	-37.4
Active	150	904	17	125	529	24	-16.1	-41.5
Dependent	119	401	30	90	288	31	-25.23	-28.18
Share of active in agricultural	55.5	69.3	80	58.3	64.7	90	5.05	-6.6
Share of active in total active	17.2	14.6	118	13.7	15.6	88	-20.35	6.8
Share of agricultural in total	13.7	16.7	82	10.6	10.9	97	-22.7	-34.7

The decline in active population was somewhat slower, so that the share of economically active population in total agricultural population in Vojvodina was enlarged. The decreased share of active agricultural population in the total working population in Vojvodina is also notable. The share of the total agricultural population in the total population in Vojvodina also declined during the analysed period (below 11%).

Agricultural population of Vojvodina represents about 26% of agricultural, i.e. 24% of active agricultural population in Serbia. Different trends and dynamics of population development among categories of agricultural population were observed in the period between two Censuses. Sharper decline of all categories of agricultural population was recorded in Serbia than in Vojvodina. The share of active agricultural population in the total agricultural population increased in Vojvodina and decreased in Serbia. However, quite the opposite trend was observed in the share of active agricultural population in the total active population. In Vojvodina that share was reduced by one fifth, while in Serbia it was increased by 7%. Such trends are primarily caused by migrations during conflicts in 1990's and the fact that the majority of refugees of rural origin (predominantly elderly households) settled in Vojvodina.

During the analysed period, the number of workers employed in agricultural enterprises was reduced by over 10,000, i.e. 22%, and the share of agricultural workers in the total number of working population decreased from 11.4 to 6.79%.

4.2.2 Land

Currently, about 114 people live on 100 ha of agricultural land in Vojvodina, and 128 on 100 ha of arable land, that is, per capita availability of agricultural land is 0.88 ha, and per capita availability of arable land is 0.78 ha.

Fragmented agricultural holdings are predominant in Vojvodina, both in terms of size and location - distance between isolated parcels and the main farmstead, particularly in small land holdings (only 25% of small land holdings have land plots consolidated into larger plots).

Taking into account that the average size of small land holding in Vojvodina is 3.59 ha of used arable land, and that each holding has three separated land parcels on the average, it can be concluded that ownership structure in Vojvodina is rather unfavourable. Multiple ownership of land and small land parcels are a huge barrier to implementation of modern technologies and use of farm mechanisation, and, subsequently, to the organisation of cost-effective production

Structure of land resources according to the land use is given in Table 4.2.2. Relatively stable volume and structure of land resources is noticeable in Vojvodina. Additionally, the use of land resources is rather intensive. Over 92 % of agricultural land is arable land, with plough land accounting for more than 95 % of arable land. Pastures, representing the most extensive land use, account for only 6 %. Yet another unfavourable trend is a slight decline in the number of vineyards in the analysed period 1981-2007 (annual decline rate -0.8 %).

Table 4.2.2. Land resources in Vojvodina and Serbia

Description	Average 2001-2007			Rate of change [%]	
	[000]ha			[1981-2007]	
	Vojvodina	Serbia	Share %	Vojvodina	Serbia
Agricultural	1,789	5,112	35	0.02	-0.51
Arable	1,648	4,252	39	0.06	-0.46
Plough land	1 581	3,345	47	0.03	-0.47
Orchards	18	244	7	0.8	-0.38
Vineyards	11	67	16	-0.8	-1.85
Meadows	37	596	6	1.2	-0.27
Pastures	111	824	13	-0.6	-0.76

Vojvodina covers 35% of agricultural area in Serbia. As for arable and plough land land, its share is 39%, and 47% of total in Serbia, respectively. However, the share of orchards is only 7% and of vineyards 16% in the most intensive land uses. On the other hand, meadows and pastures account for only 6 and 13% of the most extensive land uses respectively. Land use structure depends primarily on topography, climate, and soil quality. Vojvodina is predominantly a flatland, with temperate climate featuring all four distinct seasons, cold winters, and hot summers. Soil is high quality calcareous chernozem, for the most part. Fruit and grape growing are found in the so-called micro regions, parts of the regions with specific conditions, such as: Fruska Gora and Vrsac mountains, Subotica sands, and Telecka plateau.

Plough land use structure is unfavourable (Table 4.2.3). Cereal grains are major crops grown, while the share of vegetables and fodder crops is insignificant.

Table 4.2.3. Plough land areas in Vojvodina according to use

Description	Average 2001-2007 [000 ha]			Rate of change [%] [1981-2007]	
	Vojvodina	Serbia	Share%	Vojvodina	Serbia
Cereal grains	1,036	2,072	50	-0.80	-0.69
Oilseed crops	341	357	96	1.80	-0.14
Vegetable	83	293	28	-0.70	0.00
Fodder crop	78	468	17	-0.22	0.00

Cereal grains that constitute 66% of crops grown on plough land in Vojvodina account for the highest share, while in Serbia cereal grains represent 62% of the total. They are followed by oilseed crops (22%), vegetables (5%), and fodder crops (5%). In Serbia, this structure is somewhat different, the second place is occupied by fodder crops (14%), followed by oilseed crops (11%) and vegetables (9%).

An increase in areas under oilseed crops (soya, in particular) at the expense of grains is indicative during the analysed period. There is a falling trend in the areas under vegetables and fodder crops due to negative trends in the cattle farming segment.

Out of the total area under cereal grains, oilseed crops, vegetables and fodder crop in Serbia, Vojvodina accounts for 50%, 96%, 28%, and 17%, respectively.

4.2.3 Irrigation systems

Agricultural production in Vojvodina is dependant upon rainfall amount and distribution. In recent years, flood and drought events interchange, thus hindering normal development of economy as a whole, and agriculture, in particular. According to the data from the Water Management Master Plan of Serbia, approximately 120,000 ha of land in Vojvodina can be irrigated. About 60,000 ha are irrigated from the regional systems, mainly the Danube-Tisa-Danube Hydro System, 55,000 ha from natural waterways and 5,000 ha from accumulations. It makes less than 8% of the total arable land Vojvodina.

Taking into consideration the total number of irrigation systems, that is, land areas on which they are built, the present state of irrigation is unsatisfactory in terms of volume, equipment-technical status and capacity utilisation (Tables 4.2.4 and 4.2.5). Data in Table 4.2.4. indicate that only 1.2% (1999) and 4.4% (1990) of arable land in Vojvodina are irrigated.

Systems constructed in the previous periods, are nowadays partly out of operation due to poor maintenance and malfunction. A small number of systems are still operating. Private land holdings are interested in construction of new irrigation systems and procurement of new equipment. In recent years, the Development Fund of the APV financed purchase of irriga-

tion equipment under favourable conditions. Furthermore, Norwegian Government grants helped the construction of those systems, mostly on private agricultural holdings.

Table 4.2.4. Irrigated areas in Vojvodina (ha)

Year	Total	Plough land and gardens	Orchards	Vineyards	Meadows
1990	71,840	58,340	7,630	2,120	3,750
1994	68,080	56,050	5,910	2,400	3,720
1995	65,620	53,440	6,180	2,230	3,770
1996	66,780	54,750	5,280	1,920	4,830
1997	55,080	42,960	6,190	1,930	4,000
1998	57,270	44,830	6,550	1,920	3,970
1999	19,840	15,100	2,750	1,920	70
2000	30,188	28,088	1,841	129	130
2001	21,288	19,709	1,448	118	13
2002	25,942	24,782	1,081	79	0
2003	32,809	31,329	1,517	0	0
2004	25,058	23,500	1,406	152	0

Table 4.2.5. Technical status of irrigation systems

Year	Pumps		Canals (km)	Sprinklers	
	Number (pieces)	Capacity (m ³ /sec)		Number (pieces)	Capacity (m ³ /sec)
1990	698	159	3,023	848	53.22
1994	635	92	3,096	1,637	51.92
1995	684	68	3,225	1,628	52.36
1996	689	66	3,327	1,705	58.53
1997	691	132	3,276	1,640	62.25
1998	717	109	3,112	1,646	64.81
1999	643	89	1,857	1,663	64.38
2000	503	78	824	843	48.23
2001	500	84	805	822	50.92
2002	487	103	760	859	61.71
2003	477	97	725	790	61.38
2004	409	86	618	694	55.05

4.2.4 Capacities of farming of animals

The share of farming of animals in total agricultural output in Vojvodina (25 animal units per 100 ha of agricultural area) is very low. Regarding the structure of livestock population - livestock fund, swine production (49%) is at the top of the list, the second place is occupied by beef cattle production (38%), followed by poultry production (7%), sheep production (3%) and horse production at the end of the list (with less than 3%). The overview of livestock units by major species in Vojvodina and Serbia is given in Table 4.2.6.

Table 4.2.6. Livestock units (number of heads) in Vojvodina and Serbia

Description	Average (2001-2007)			Rate of change [%]	
	Vojvodina	Serbia	Share%	Vojvodina	Serbia
Cows and pregnant heifers	107,300	727,000	14.8	0.53	-1.19
Sows and pregnant gilts	180,000	714,000	17.1	-4.01	-6.01
Farming ewes	122,300	1,160,500	10.5	7.15	1.45

Vojvodina accounts for 15% of the cattle farming stock, 17% of swine farming stock, and 11% of sheep farming flock in Serbia. This is much less than the share of Vojvodina in agricultural land capacities and it is an indication of the lower share of farming of animals in Vojvodina in relation to other parts of Serbia. However, replacement rates in the farming herds are more favourable in Vojvodina for all classes of analysed animals.

4.3 Production results

4.3.1 Growing of crops

4.3.1.1 Growing of crops and vegetables

Average yields of principal field crops for three characteristic periods (1981-1990 – before the crisis; 1991-2000 – during the crisis and 2001-2007 – after the crisis) are given in Table 4.3.1. All crops yields (save sunflower) showed upward trends in the last analysed sub-period (2001-2007). That growth, however, is not sufficient enough to bring about average yields recorded in 1980's (except for soya), let alone for comparison purposes with crop yields in the EU. In relation to Serbia, yields for all the analysed crops are somewhat higher (to 10%).

Table 4.3.1. Yields of principal field crops (t/ha)

Description	Vojvodina – Average				Serbia – Average	
	1981-90	1991-00	2001-07	Rate of change [%]	2001-07	Rate of change [%]
Wheat	4.9	3.9	3.7	2.89	3.4	4.32
Corn	5.7	4.6	5.3	5.09	4.8	1.43
Sugar beet	42.7	34.0	41.0	3.94	40.8	16.80
Sunflower	2.1	1.8	2.0	-0.15	1.9	1.47
Soya	2.0	2.0	2.4	4.44	2.4	3.72

Table 4.3.2. shows the development in total Manufacture of principal field crops in certain sub-periods. Cereal grains and sugar beet production is markedly reduced, while increase is recorded in soybean production (by over 100%, due to the yield and acreage enhancement) and sunflower production (over 50% due to the acreage enhancement).

Table 4.3.2. Manufacture of principal field crops (000 t)

Description	Vojvodina – Average				Serbia – Average	
	1981-90	1991-00	2001-07	Rate of change [%]	2001-07	Rate of change [%]
Wheat	1,726	1,428	1,230	-3.46	2,180	-5.63
Corn	3,833	3,054	3,339	5.5	5,794	0.45
Sugar beet	3,757	2,029	2,209	14.8	2,312	15.27
Sunflower	216	284	324	6.87	348	4.9
Soya	128	128	257	15.42	273	20.05

Corn is the most widely grown crop. It is grown on about 630,000 ha, with the yield per hectare in the observation period (2001-2007) of about 5.3 t/ha, and annual Manufacture of approximately 3.3 million tons. Huge annual variations in yield (from 2.9 t/ha in 2000 to 6.5 t/ha in 2005) and total production (from 1.8 million tons in 2000 to 4.2 million tons in 2005.) are mainly caused by extensive production without irrigation. The share of Vojvodina in the total corn production in Serbia is about 58%.

Wheat is grown on approximately 330,000 ha, with average yield of about 3.7 t/ha and annual Manufacture of about 1.2 million tons. Variations in production of wheat are more noticeable in changes of planted areas than in yield and total production. Areas under wheat are somewhat smaller in relation to previous ten-year periods, yield is lower by over 20% than averages from 1980's, and, consequently, the average annual production is lower by about 500,000 tons. Vojvodina makes up over 56% of the total wheat production in Serbia.

Sugar beet was grown on about 52,000 hectares, with average yield amounting to 41 t/ha, and annual output of about 2.2 million tons. Variations in production of sugar beet were substantial during dry years (2000 and 2003). In the last three years of the observation period (2005-2007), the areas planted with sugar beet significantly increased, with the evident growth in yield and production in the last two years. Land under sugar beet is markedly reduced as compared to 1980's (88,000 ha), and hence, the yield and total production dropped (3.8 million tons). During 1990's, a considerable extensification of agricultural production occurred as the result of dissolution of Yugoslavia, wars, embargo and other prevailing economic and social circumstances. Production inputs were drastically cut (consumption of fertilisers and plant protection agents was reduced by one third in relation to 1980's) and that resulted in a yield decline. The decline in yield was at a higher rate in intensive growing of crops (sugar beet) than in less input intensive growing of crops (wheat). Vojvodina makes up over 96% of the total sugar beet production in Serbia.

Sunflower was grown on about 160,000 hectares, with average yield of 2 t/ha, and annual output of about 320,000 tons. Land under sunflower is markedly increased as compared to 1980's. Sunflower yield is stable, and, therefore, average annual production enhanced. Almost the entire sunflower production in Serbia comes from Vojvodina (93%). As in the case of sugar beet and sunflower production, Vojvodina accounts for the highest percentage of soya production in Serbia (94%).

Soya was grown on about 110,000 ha, with average yield amounting to 2.2 t/ha, and annual output of about 250,000 million tons. Following dry years and drastically reduced yields, the land under soybean was considerably decreased, and variations in the total planted areas, yield and total production of soya were substantial due to extensive – «dry farming» (without irrigation). The largest increase in planted areas is recorded in soya production (over 40,000 ha). Soybean yield increased by 10%, and total production is more than doubled in relation to the previous periods.

Vegetable crops are grown on only 5% of the total plough land in Vojvodina. Vegetables are produced mainly by small farmers. Vegetable production covers the area of less than 75,000 ha or 92% of the total land under vegetable.

Vegetable crops production, in terms of the range of products, has remained rather stable as the result of eating habits. The most widely grown vegetables include potato, melon and water melon, peas, beans, onion, paprika, tomato, cabbage and Savoy cabbage.

During the analysed period (2001-2007), the average yields of the analysed vegetable crops in Vojvodina show continuing upward trend (Table 4.3.3).

Yield levels of different vegetable crops significantly differ between large-scale and corporate operations and small family farms. Large-scale farms have much higher yields per unit area of most grown vegetables. Small family farms, on the other hand, have much smaller level of yield variations.

On the whole, vegetable production is in decline because farmers are less interested in vegetable production, although an average yield is rising.

Table 4.3.3. Yields and production of principal vegetable crops (t/ha)

Vegetable	Yield (t/ha)		Annual production (t)	
	Yield 2001-2007	Rate of change [%]	Yield 2001-2007	Rate of change [%]
Potato	12.4	6.6	314,956	-5.29
Peas	1.18	2.3	8,811	-1.71
Green beans	2.88	4.2	18,811	-2.35
Melon and water melon	18.20	1.6	166,619	-0.73

Alfalfa and clover, intended as animal feed, are grown on 81% of the total area under forage plants in Vojvodina. Alfalfa is the most widely grown crop from the group of fodder crops (76%). Areas under alfalfa, however, show downward trend (at the rate of -9.2%). Average yield of alfalfa hay in Vojvodina amounts to 5.8 t/ha and shows a slight growth (3.7%). Average annual production of alfalfa hay in the period from 2001 to 2007 made 340,000 tons as the result of increase in yield and decrease in planted areas.

4.3.1.2 Growing of fruit and grape

The total number of productive fruit trees of the analysed fruit varieties in the period from 2001 to 2007 was 11.5 million (Table 4.3.4) on the average. Small family farms, with about 7.3 million fruit trees represented 63.5% of the total number of fruit trees in Vojvodina.

The most widely grown fruits in Vojvodina are apple (40%), plum (22%), sour cherry, and pear (11%). Apple (about 65,000 t), plum (38,000t), sour cherry (14,000t), and peach (11,000t) have the highest production.

Table 4.3.4. Number of productive fruit trees and principal fruit crops

Fruit varieties	No. of productive trees		Production		Yield
	Average 2001-07 (000 pcs)	Structure (%)	Average 2001-07 (ton)	Structure (%)	kg/tree
Apple	4,671	40.4	64,580	44.1	13.8
Pear	1,293	11.2	9,700	6.6	7.5
Plum	2,573	22.2	37,531	25.6	14.6
Cherry, sour	1,351	11.7	13,586	9.3	10.1
Cherry, sweet	285	2.5	3,935	2.7	13.8
Apricot	395	3.4	5,680	3.9	14.4
Peach	1,001	8.6	11,401	7.8	11.4
Total	11,569	100.0	146,413	100.0	-

Semi-processed fruit products include partially processed and preserved out-of-season fruits used for further processing, i.e. finalisation. In order to maintain a continued production of some products (gelatinised products), fruit juices, etc. harvested fruit is prepared, subjected to thermal preservation by heating or freezing and stored until final processing. This product group includes fruit pulps, fruit purees, juices (raw), and fruit pasteurised to a certain extent. Annual production of semi-products: fruit pulp and puree – pasteurised 217 t, pulp and puree – frozen 1,499t, pulp and puree – preserved 801t and frozen fruit 3,439 t.

Industrial production of semi-processed fruit products in Vojvodina is characterised by decline in volume and high variation rates over the years.

Fruits and vegetables in Vojvodina are processed in about 35 larger and smaller processing plants of different processing capacities and production programmes. Virtually all forms of preservation process are applied: thermal treatments, drying, marinating, bio-fermentation, high sugar concentration, and chemical preservation. Most fruit and vegetable processing plants use combined fruit and vegetable processing with combined preservation treatments, being justifiable from technological-economical viewpoint. Complete plants designated exclusively to fruit processing have never been constructed in Vojvodina, and, therefore, from that point of view, we cannot even speak of proper fruit processing.

The structure of fruit processing production is the following: fruit juices 89,000t, fruit syrups 500t, preserved fruit 730t, marmalade 2,500t, and jam 70t. Production of fruit juices and jams is rising, and of other analysed fruit products declining, with a high rate of variations in production volume from year to year. These variations are due to uneven annual production and lack of permanent markets.

Grapes are grown mostly at family wine-growing holdings and vineyards. Areas under vines of wine grape varieties in the period from 2001 to 2007 made 11,400 ha. Total areas under vines decline at an average annual rate of -1.85%. Annual grape production of 74,000 tons also shows a downward trend as the result of decline of areas under vines.

Wine production in Vojvodina takes place in seven wineries and a number of smaller-sized wine cellars. The largest producer of wines is the winery Vrsacki vinogradi – Vrsac.

4.3.2 Farming of animals

Data on farming of animals were analysed by sections and compared with (in addition to Serbia) a neighbouring country – Hungary.

4.3.2.1 Farming of cattle

Comparative analysis by quantity of production in farming of cattle in Vojvodina and Hungary included annual data on yields (annual gain and milk production per cow) and total production (total number of heads of cattle and total annual milk production). Results are presented in Table 4.3.5

Table 4.3.5. Changes in output of farming of cattle in the AP Vojvodina and Hungary in the period from 2001 to 2007

Description	Vojvodina				Mađarska			
	Average	Min	Max	Rate of change %	Average	Min	Max	Rate of change
	2001-07				2001-07			%
Weight gain per cow and pregnant heifer (kg)	447	404	509	2.46	323,7	310	338	0.65
Milk per cow (litre)	3,596	3.179	4.093	2.41	6,033	5,335	6,693	3.29
Total cattle	228,900	212,000	269,000	2.08	741,900	702,000	805,000	-1.88
Total milk production 000 lit	334,700	292,000	397,000	2.91	1,939,700	1,793,800	2,080,600	-2.1

Cattle stock in Vojvodina is almost 3.3 times smaller than in Hungary. However, as opposed to Hungary, Vojvodina has a positive replacement rate needed to maintain the cow herd, i.e. replacement cows/ pregnant heifers. In the observation period, the average weight gain was higher in Vojvodina by almost 40% (447 kg versus 324 kg), which is probably because of differences in breed composition. Simmental cattle (dairy/beef) are a dominant breed in Vojvodina, while dairy breeds are prevailing in Hungary. This is also shown by the average milk per cow data being higher by 68% or 2,437 litres per cow a year in Hungary. Vojvodina will not reach the Hungarian average level of milk yield per cow for a long time. Milk yield per cow in Vojvodina is higher than in Serbia, where dairy/beef cattle breed (Simmental) is predominant, too. The total number of heads of cattle is also 3.3 times higher in Hungary, but it is in a declining trend, as opposed to positive upward trend in Vojvodina (2.08%). Vojvodina accounts for about 20% of the total number of heads of cattle in Serbia. Total milk production in Vojvodina is about 5.4 times lower than in Hungary, but with the observed positive trend in the total cattle number versus negative trend in Hungary ($r=-2.1$), where cattle number is reducing at the faster rate than average per cow milk yield increases.

4.3.2.2 Farming of swine

Changes in production in farming of swine are not as favourable as in farming of cattle (Table 4.3.6). Swine stock is in decline at a rate of four percent annually, almost the same as in Hungary. Average weight gain per sow of 1,042 kg, is lower by as much as 583 kg, or 56% than in Hungary. It is assumed that the factors attributed to such a difference are higher weight and age at slaughter and the fact that piglets are generally not slaughtered in Hungary. Swine farming stock in Hungary is larger by 135 thousand heads, or 75%. Negative trends in the total number of swine are recorded in both Vojvodina and Hungary as the result of prevailing economic conditions in farming of animals sector as a whole. Vojvodina accounts for one third of the total swine population in Serbia.

Table 4.3.6. Changes in output of farming of swine in the AP Vojvodina and Hungary in the period from 2001 to 2007

Description	Vojvodina				Mađarska			
	Average	Min	Max	Rate of change %	Average	Min	Max	Rate of change
	2001-07				2001-07			%
Weight gain per sow (kg)	1.042	877	1.217	3,24	1.625	1.544	1.712	0,69
Total number of sows (million heads)	1,353	1,19	1,538	-1,43	4,428	3,853	5,082	-3,12

4.3.2.3 Farming of sheep

Farming of sheep does not play as significant economic role in agriculture of Vojvodina as farming of swine and cattle. The results of comparative analysis of output in farming of sheep in Vojvodina and Hungary in the period from 2001 to 2007 are given in the Table 4.3.7.

Production parameters in farming of sheep in Vojvodina show positive trend. Annual number of farming ewes and total number of sheep bred in Vojvodina are high, and an average gain per farming ewe is in an upward trend (3.98% annually).

The output of farming of sheep in Hungary, however, has shown slower increase in sheep population, and weight gain per farming ewe is in a downward trend. Average weight gain per farming ewe during the observation period was improved by 58%, or was higher by 14.6 kg than in Hungary. It is an indication of the expansion of farming of sheep in Vojvodina, while Hungarian farming of sheep sector is in crisis. Far better weight gains per sheep were recorded in Hungary in the previous period, but those data are in a continuous decline. Vojvodina accounts for only 12% of the total sheep population in Serbia.

Table 4.3.7. Changes in output of farming of sheep in the AP Vojvodina and Hungary in the period from 2001 to 2007

Description	Vojvodina				Hungary			
	Average	Min	Max	Rate of change %	Average	Min	Max	Rate of change %
	2001-07				2001-07			
Weight gain per farming sheep (kg)	39.9	30.3	63.8	3.98	25.3	22.3	27.8	-3.39
Total number of sheep (heads)	185,000	140,000	254,000	6.98	1,249,500	1,103,000	1,405,000	1.26

4.3.2.4 Farming of poultry

Farming of poultry in Vojvodina exhibits a certain level of stability and stagnation, as indicated by relatively low coefficients of variation and positive annual rates of change, which are below 1% for all the analysed functions (number of laying hens, eggs per layer, total egg production, total poultry). Farming of poultry in Hungary has shown negative trends during the same period (with the exception of the number of eggs per layer, which is in stagnation – Table 4.3.8).

Laying hens population in Vojvodina is 4.3 times, egg production 7.2 times and total poultry 2.8 times smaller than in Hungary. This is because of the so-called “hard line”, namely egg-based production prevailing in the Hungarian poultry production, while in Vojvodina the so-called “soft line”, i.e. meat (broiler)-based production is dominant. Egg output in Hungary, with 212 eggs per layer annually, is higher by 70% than in Vojvodina. Poultry population in Vojvodina accounts for 37% of the total number of birds in Serbia.

Table 4.3.8. Changes in output of farming of poultry in the AP Vojvodina and Hungary in the period from 2001 to 2007

Description	Vojvodina				Hungary			
	Averag 2001-07	Min	Max	Rate of change [%]	Averag 2001-07	Min	Max	Rate of change [%]
Number of laying hens (million)	3,497	3,121	4,093	0.16	14,935	13,040	16,348	-1.62
Eggs per layer (pieces)	125	107	138	0.75	212	205	218	0.07
Total egg production (million pieces)	437	334	507	0.92	3,163	2,843	3,433	-1.55
Total poultry (million)	6,563	5,737	7,364	0.60	18,350	15,798	20,150	-1.03

Based on the results of comparative analysis of farming of animals in the period from 2001 to 2007, the following conclusions can be made:

- ▶ Negative rates of change, characteristic for all the analysed classes of animals in Vojvodina during the observation period are still present only in swine production. In farming of poultry, decline in the number of birds has stopped, and the number of poultry population has been stabilised at a lower level. Positive trends are recorded regarding total cattle, and, in particular, sheep population. Average farming stock population – number of heads of animals, in relation to the last five-year period, decreased in swine, sheep, and poultry production and increased only in cattle production.
- ▶ Intensity of farming of animals in Vojvodina, measured with average yield, has shown positive trends in all sectors of farming of animals (weight gain and milk per cow yield, gains per swine and sheep, eggs per layer).
- ▶ Negative results in farming of animals in Vojvodina in relation to Hungary are as follows:
 - Lower average milk per cow yield,
 - Lower average gain per farming sow,
 - Lower average egg production per laying hen,
 - Lower cows, swine and sheep density

- ▶ Positive results in farming of animals in Vojvodina are as follows:
 - Higher average gain per farming heifer,
 - Higher average gain per farming ewe,
 - Higher poultry density;
- ▶ All the analysed functions of in farming of animals in Vojvodina have shown more positive trends than those in Hungary (higher rates of change over the observation period from 2001 to 2007).
- ▶ Share of Vojvodina in farming of animals in Serbia is much lower than its share in crop farming sector. Out of the total number of poultry, swine, cattle, and sheep in Serbia, Vojvodina accounts for 37%, 33%, 20%, and 12%, respectively.

4.3.2.5 Livestock density

One of the basic natural indicators of intensity of farming of animals is the livestock density, which can be expressed as follows:

- Number of cattle per 100 ha of arable land,
- Number of swine per 100 ha of arable land,
- Number of sheep per 100 ha of arable land and
- Poultry per 100 ha of arable land.

Changes in livestock density in Vojvodina are shown in Table 4.3.9.

Table 4.3.9. Changes in livestock density in Vojvodina

Category	Year					Average	Rate of change %
	2003.	2004.	2005.	2006.	2007.		
Number of cattle per 100 ha of arable land	13	13	13	13	13	13	0.00
Number of swine per 100 ha of arable land	89	79	83	84	75	84	-4.82
Number of sheep per 100 ha of arable land	8	8	9	11	11	9	6.58
Poultry per 100 ha of arable land	417	415	395	363	462	416	0.80

Comparative indicators of livestock density for Vojvodina, Serbia and Hungary are given in Table 4.3.10.

Table 4.3.10. Comparative analysis of livestock density – averages 2001-2007

Category	Vojvodina	Serbia	Hungary	Indices [%]		
				02-Mar	02-Apr	03-Apr
1	2	3	4	5	6	5
Number of cattle per 100 ha of arable land	12.7	19.5	33.4	65	38	58
Number of swine per 100 ha of arable land	85.6	95	96.3	90	89	99
Number of sheep per 100 ha of arable land	10.3	26.6	21.5	39	48	124
Poultry per 100 ha of arable land	415	484	316	86	131	153

The results from the presented Tables show that farming of animals in Vojvodina is lagging behind those in Hungary and Serbia. Cattle density of nearly 13 heads per 100 hectare of utilised agricultural area in Vojvodina appears to be 2.6 times lower than in Hungary, or 35% lower than in Serbia. Swine density of 86 heads per 100 hectare of arable land is slightly lower (by about 10%), and sheep density (10 heads per 100 hectare of agricultural area) is over 2 and 2.5 times lower than in Hungary and Serbia, respectively. Vojvodina is only better in poultry density, with 415 birds per 100 hectare of arable land, being by about 30% higher than in Hungary. It is to be noted, however, that other poultry species, which are more widely grown in Hungary than in Vojvodina were not taken into account (geese, ducks and turkeys). Poultry density level in Vojvodina is lower by about 15% than in Serbia.

4.4 Economic results

4.4.1 Gross domestic product

Development trends of Vojvodina agriculture have been analysed based on the dynamics of gross domestic product. The value of gross domestic product (GDP) is expressed in terms of constant prices from 1994, to avoid the effects of inflation and generate as real as possible picture of its dynamics.

Agricultural gross domestic product is higher than gross domestic product from food industry, indicating that the vast majority of agricultural products are not processed, but used or exported in their raw state (Table 4.4.1). The share of Vojvodina in gross domestic product of food industry in Serbia (47.3%) is higher than its share in agricultural gross domestic product of Serbia (39.6%), regardless the fact that structure of agricultural production is more intensive in other parts of Serbia (higher share of vegetable and fruit growing, and farming of animals). The reason for this is greater concentration of cereal grains and oilseed crops processing operations in Vojvodina.

Table 4.4.1. Agricultural and food industry gross domestic product– current prices (million dinars)

Year	Serbia	Vojvodina	Share in %
	AGRICULTURE		
2000	72,656	29,904	41.2
2001	135,955	55,950	41.1
2002	130,783	50,450	38.6
2003	129,744	46,985	36.2
2004	162,258	65,978	40.7
Rate of change %	22.2	21.9	-
	FOOD PROCESSING INDUSTRY		Share in %
2000	28,489	14,276	50.1
2001	54,695	25,000	45.7
2002	73,348	32,292	44.0
2003	71,423	33,282	48.6
2004	87,230	42,130	48.3
Rate of change %	32.2	31.1	-

Comparative analysis of gross domestic product dynamics in economy, agriculture, and sectors of agriculture (large-scale agricultural operations and small family farms) is given in Table 4.4.2.

Table 4.4.2. Dynamics of gross domestic product in economy, manufacturing, and agriculture of Vojvodina – expressed in constant prices from 1994 In million dinars

Period	Average (million RSD)	Variation coefficient [%]	Interval of variation		Rate of change [%]
			Min.	Max.	
Economy					
1991 – 2000	7.355	26.42	5.889	12.300	-3.75
2001 – 2007	7.344	3.58	7.126	7.695	2.05
Manufacturing					
1991 – 2000	3,069	31.84	2,266	5,377	-4.29
2001 – 2007	3,194	8.42	2,986	3,499	5.45
Agriculture - Total					
1991 – 2000	1,602	10.48	1,384	1,935	-0.37
2001 – 2007	1,604	6.96	1,426	1,694	-0.09
Large-scale agricultural operations					
1991 – 2000	592	17.65	473	871	-3.25
2001 – 2007	540	3.83	513	562	1.23
Small family farms					
1991 – 2000	1,010	10.92	842	1,141	1.48
2001 – 2007	1,064	9.18	913	1,157	-1.01

Gross domestic product showed an upward trend in the period from 2001 to 2007 in economy (growth rate of 2.05%) and industry (growth rate of 5.45%), while in agriculture it showed stagnation trend (decline rate of – 0.09%) as opposed to the previous period (1991-2000).

In recent years, particularly marked growths of production and capacity utilisation have been recorded in those branches of food industry that invest in their raw material base (dairy plants, sugar plants, oil processing plants and soya processing plants). Food industry of Vojvodina should upgrade its processing technology, implement ISO standards, improve product quality and enhance production, raise investments and expand raw material base. In that way, it will increase capacity utilisation level, improve quality of its products, secure export market access in the EU, and considerably elevate its efficiency and competitiveness at the world market. Development of food industry will have a positive effect on the development of primary agricultural production in Vojvodina, as its raw material base.

4.4.2 Productivity

To identify trends and growth rates in productivity, it is necessary to determine growth rate of GDP per employee, i.e. active agricultural worker, and compare it with those in industry (Table 4.4.3). GDP per employee in Vojvodina agriculture is significantly lower than GDP per employee in industry.

In the period from 2001 to 2007, much faster growth rate was recorded in industry (10.6%) in comparison to agriculture in Vojvodina (growth rate of 1.31%), thus strongly affecting GDP per employee, i.e. GDP per active agricultural worker rate (industry – 22.329 RSD; agriculture 12.985 RSD).

Table 4.4.3. Trends in productivity (GDP per employee, i.e. active agricultural worker) in Vojvodina (Constant prices from 1994)

Period	Average value (d)	Variation coefficient [%]	Interval of variation		Rate of change [%]
			Min.	Max.	
Manufacturing					
1991–2000	15,832	24.40	10,966	23,687	-0.98
2001–2007	22,329	15.77	17,910	26,455	10.59
Agriculture – Total					
1991– 2000	11,520	10.79	9,788	12,936	1.24
2001– 2007	12,985	7.30	11,545	14,159	1.31
Large-scale agricultural operations					
1991– 2000	11,286	13.34	9,867	14,420	0.17
2001– 2007	14,555	17.86	12,466	18,419	10.64
Small family farms					
1991– 2000	11,642	10.90	9,506	13,178	1.95
2001– 2007	12,458	8.79	10,838	13,793	-2.27

The analysis of key financial indicators was conducted based on the data from financial statements, namely summary balance sheets, collected, and processed by the National Bank of Serbia – Solvency Centre. The analysis encompassed only businesses having status of legal entity (large-scale and corporate operations and co-operatives), without small family farms.

During the observation period (2001-2007), the total number (in all sectors of economy) of business entities operating in Vojvodina ranged from 16,019 to 17,767. Out of the total number of business entities in Vojvodina, small enterprises accounted for 95.2%, medium-sized 3.7%, and large enterprises only 1.1%. In the same period, the number of employees fell from 333,564 to 267,126, or by approximately 19%.

The number of enterprises and co-operatives engaged in agricultural activities ranged from 1,267 to 1,448, with the continuing growing trend. Out of the total number of employees in Vojvodina in 2005, around 13.2% were employed in agriculture.

Enterprises from food industry sector accounted for 2.76 - 4.36% of the total number in Vojvodina. The number of these enterprises ranged from 433 to 774, with a significant increase of 20.4%. Small enterprises accounted for 42.7%, medium-sized 5.4%, and large enterprises for 3.9%. Increase in number of employees took place only in food industry, jumping from 37,340 to 38,276, i.e. by 2.5%.

The share of assets owned by agricultural enterprises in total assets of Vojvodina economy rose by 4.1% (from 10.3% to 14.4%) during the analysed period. At the same time, the share of food industry fell by 2.1% (from 13.8 to 11.7%). The share of agriculture and food industry together grew by 2% (from 24.1 to 26.1%).

Despite significant decrease from 67.6% to 61.0%, fixed assets represented a major part of assets of agricultural enterprises. The increased share of working capital in operating assets (from 23.7% to 31.4%) is a good indicator, reflecting enhancement in operating activities. Still high share of accumulated losses (7.6%) is an indication of low average performance efficiency in agriculture, and of incomplete process of ownership transformation. The share of working capital in food industry is substantially higher (32.6-41.5%).

Agricultural enterprises and co-operatives had negative gross and net financial result in all years of the observation period, while food industry had positive results in 2001, 2002 and 2004.

Food industry experienced negative financial result from ordinary activities only in 2003, and operating profit over the entire observation period.

The return on investments in food industry is very low, though slightly better than in agriculture.

Negative operating results throughout the observation period are indication of poor operating results of agricultural enterprises. Food industry recorded poor operating results, too, despite the positive, though moderate, growth rates in three out of six years of the observation period;

Drastic disturbances in financial equilibrium and lack of self-financing capacities are indications of a deep imbalance in financial structure of agricultural enterprises and their poor financial standing. Food industry managed to increase its own equity during the observation period, but exhibited financial instability, high indebtedness and low self-sufficiency level, and, therefore, cannot be considered as successful;

To improve their financial performance, agricultural enterprises need influx of capital, which can be secured through additional investments and/or favourable loans.

4.5 Agrarian policy

The Republic of Serbia, and AP Vojvodina as its integral part, belongs to the group of less developed countries according to indicators of economic development. Low development level is found in the agrarian sector, too. The following principles of agrarian policy have been identified in line with the prevailing economic circumstances:

- ▶ To develop sustainable and efficient agricultural sector, competitive at the world market and contributing the total (national) revenue growth;
- ▶ To secure food meeting customers expectations related to food safety and quality;
- ▶ To provide an acceptable standard of living and quality of life to self-sufficiency farmers not able to develop their production in line with the economic reform;
- ▶ To support sustainable development of rural regions;
- ▶ To ensure environmental protection against detrimental impacts of agriculture;
- ▶ To prepare agrarian sector for the EU integration process, and
- ▶ To pursue agricultural domestic support policy in conformity with the World Trade Organisation (WTO) rules.

The analysis of the agrarian budget of the Republic of Serbia during the observation period provides a clear insight into specific-purpose use of budgetary funds for protection of agricultural producers and development of agricultural production and rural regions. Throughout all seven years of the observation period (2001-2007), there was a notable trend of dairy premiums, aids for oilseed crop producers and subsidised prices for some inputs. The funds for these purposes accounted for about 60% of the total agrarian budget. The share of funds for dairy premium payments accounted for around 40% of the total agrarian budget on the average during the five-year period. It should be noted that higher dairy premiums were paid to the mountain dairy farmers due to unfavourable working conditions.

The funds from the agrarian budget were allocated for subsidising oilseed crops production. In addition to the already established premiums for sugar beet and tobacco producers, direct single payments to soya and sunflower producers were introduced as of 2003. Premium value, expressed on a per unit basis, is pre-determined, and its payment depends on the achieved yield per hectare. Beneficiaries are also eligible to receive a part of the premium in advance, i.e. before production completion. The share of funds for oilseed crop premium payments accounted for around 30% of the total agrarian budget on the average.

Within agricultural subsidy programme in 2005, the subsidy premiums were paid per one kilo of delivered product for mercantile rapeseed, mercantile soya, hop, mercantile sunflower, and tobacco. Additional funds were allocated for premium advance payment. The policy of subsidising purchase of farming animals and honeybee stocks continued over the observation period.

Throughout the analysed period, state subsidies for purchase of farming animals were reserved in the agrarian budget. These subsidies are paid per head of farming animals purchased for reproduction purposes or animals produced on-farm but intended for further reproduction on the farm. The very fact that subsidies for farming animals account for only 3% of the total agricultural subsidies, explains a very slow replacement of the animal fund. Unfortunately, enlargement of the present agrarian funding mechanism is still not possible.

Special funds are allocated from the budget for subsidising purchase of diesel fuel needed for the execution of agricultural works. Through support for the purchase of diesel fuel and fertilisers, the state aims to reduce the total production costs of agricultural estates. For example, fund for subsidising purchase of diesel fuel and fertilisers represented 9.61% of the agrarian budget in 2004.

The programme of work on protection, use, and management of agricultural land is also included in the agrarian budget of the Republic of Serbia. The funds from this programme are used each year for the following purposes: land consolidation, drainage, irrigation, conversion of non-cultivated into cultivated land, raising quality of cultivated land, reclamation of grassland in the mountainous regions, biological land re-cultivation, monitoring fertility of privately owned cultivated land and for preparing plans relative to protection, use, and management of agricultural land. In addition, cost estimates for the planned works and work schedules are made on a yearly basis. The funds needed for the Programme implementation are

usually allocated from the agrarian budget of the Republic of Serbia. During the analysed five-year period, the vast majority of these funds were used for investment works – land consolidation, drainage, and monitoring fertility of privately owned cultivated land (about 60% of the total). For the purpose of raising quality of cultivated land, the funds for land calcification process are allocated, too. This process aimed at improving pH of the acid soil is carried out by specialised teams, and funded from the budget.

Yet another measure introduced as from 2001, and still underway, is related to exchange of agricultural commodities for agricultural mechanisation. In that way, farmers are enabled to renew mechanisation on their holdings under relatively favourable conditions. Within this programme, farmers were allowed to pay for new mechanisation with mercantile corn and wheat, fattening swine and beef cattle, crude sunflower oil and sugar.

The analysis of economic performance of the agrarian sector in Serbia has indicated to rather poor state of fruit and grape growing production. Substantial financial resources are needed to maintain the existing, and develop new plantings of fruit trees and vines. Since fruit and grape producers lack necessary funds, the only rational solution appears to be in state subsidies. From 2002, the Government of the Republic of Serbia, in co-operation with the Ministry of Agriculture, Forestry, and Water Management, provides subsidies for new plantings of plums and vines. The amount of these subsidies for specific varieties, areas under new plantings and plant density is specified by the Decree and paid to beneficiaries per hectare of planted area. Beneficiaries are also entitled to be paid a part of the subsidy in advance provided that at least 90% is planted.

The Government of the Republic of Serbia adopted the Programme for development and promotion of farming of animals in the Republic of Serbia for the period from 2003 to 2007. The Programme defines selection measures in farming of cattle, swine, sheep, goats, horses, poultry and bees, as well as detailed financing scheme.

Consolidation of agricultural holdings pertaining to farmers is one of prerequisites for the development of modern, efficient, and high-productive agricultural production. By the end of 2002, the Government of the Republic of Serbia passed the Decree on the use of funds for consolidation of agricultural holdings pertaining to farmers, defining conditions and terms for the use of grants amounting to 33.3% of the value of purchased arable land. All physical persons are eligible to apply for subsidy providing they have fulfilled their obligations concerning payment of taxes, and by providing evidence that they

- ▶ Own three or more hectares of arable agricultural land of I, II, III, IV, and V cadastral class or
- ▶ Do not own arable agricultural land of I, II, III, IV, and V cadastral class, but are willing to buy at least six hectares of arable agricultural land.

By the middle of 2003, the Government of the Republic of Serbia passed the Decree on the export subsidies for agricultural-food products. The use of export subsidies was concentrated on a certain priority products: veal, milk, milk products, blackberry, cherry, meat products, and wines. In addition to the total amount of export subsidies, relative subsidy value in relation to the selling prices was determined. All legal entities registered for export of agricultural-food products were eligible for subsidising. Export subsidy policy continued to be applied in the following years at slightly changed rates.

Preservation and sustainable use of farm animals' genetic resources was yet another activity for which subsidies were granted. Upon meeting the applicable criteria, established by the Minister of agriculture, forestry, and water management, breeders of endangered indigenous farm animal breeds are eligible to receive assistance, the amount of which is determined in accordance with the total output and a price per unit.

In 2004, measures for preservation and sustainable use of plant genetic resources for food and agriculture were passed, as follows:

- ▶ Keeping and maintaining national seed collections, and
- ▶ Preservation and sustainable use of crop, fruit, and grapevine genetic resources.

In the framework of the Programme for preservation and sustainable use of plant genetic resources for food and agriculture, measures and activities to be financed from the state budget were specified. Furthermore, additional financial resources for implementation of projects related to plant genetic resources for food and agriculture, genetically modified organisms, and gene banks were planned.

Considering the importance of rural development, special funds intended for improvement of quality of life and the management of economic activities in rural areas were allocated from the state budget in 2005. Farmers, co-operatives, and other legal and physical persons are eligible to receive aid for improving performance of their agricultural holdings, subject to their own financial participation. The amount of assistance is determined in accordance with the estimated value of the project, i.e. activity.

4.6 Financing of agriculture

Following the establishment of the Development Fund of the Republic of Serbia, and in co-operation with the Ministry of Agriculture, Forestry and Water Management, and the Ministry of Finance, registered agricultural holdings were given the opportunity to apply for loans intended for the development of agricultural production. The planned credit models were the following:

- ▶ Short-term loans for physical persons (farmers) via business banks;
- ▶ Long-term loans for agricultural enterprises (legal entities and physical persons), via business banks, and
- ▶ Long-term loans for agricultural enterprises (legal entities and physical persons), via the Development Fund of the Republic of Serbia, that is, an adequate Fund of the AP Vojvodina.

Despite the fact that during the observation period (from 2004 to 2006) the interests in short-term loans were about 5% per annum, the loans intended for that purpose showed a decreased share in the total credit arrangements, while the share of long-term loans showed an upward trend.

Regarding the changes in the budgetary support policy to agriculture, reductions in price subsidies and increase in total direct payments are to be expected.

Taking into account the prevailing circumstances in agricultural sector and economy as a whole, major changes in the agrarian policy should be directed to the change in prioritisation of subsidising measures. To this effect, the focus should be on the support to rural development at the expense of price subsidy policy.

The development of modern agricultural production in the AP Vojvodina depends to the great extent on the amount funds allocated from the provincial funds. The Assembly of the AP Vojvodina has established five funds in total so far by to assist the development of agriculture in the Province.

4.6.1 Development Fund of the AP Vojvodina

Out of aggregate allocated funds in the Development Fund of the AP Vojvodina totalling to 135.80 million euros, the amount of 24.35 million euros is intended for the development of agriculture, namely, i.e. 15.71 million euros for agricultural holdings and 8.64 million euros for co-operatives development. The loans for agricultural holdings accounted for 65% and for co-operatives for 35% of the total funds for the development of agriculture. In 2007, as much as 72% of these funds were intended to agricultural holdings. Regarding the share of loans for farming of animals, only 6% or 1.19 million euros of the total funds were used for short-term financing of beef cattle fattening. It represented only 55% of realised loans since 2.17 million euros were approved for financing of farming of animals in 2007. During the period from 2005 to 2007, out of the total of 47.69 million euros of realised loans, 12.46 million euros or 26% were realised in farming of animals. The share of loans for farming of animals increased, ranging from - 20% in 2005, - 24% in 2006, and as high as 38% in 2007. This positive trend is expected to be continued in the forthcoming years. The state must define principles of agrarian policy, so that funds allocated to farming of animals could have positive effects on animal populations increase.

4.6.2 Guarantee Fund of the AP Vojvodina

The main task of the Guarantee Fund is to promote development of economy and agriculture in the AP Vojvodina. This task is realised by the Fund through its basic activity, the issuing of guarantees to banks as the collateral of regular bank loans repayment. In the period from 2005 to 2007, the loan guarantee potential totalling to 21 million euros was allocated and 490 guarantees were issued. In the above-mentioned period, no payments by the Guarantor under the issued guarantees were made, meaning that credit standing of the applicants was correctly assessed and guarantees related risks reduced to minimum. Out of the total loans, the amount of 19.57 million euros was granted for agriculture during the analysed three years. In 2005, the amount of 4.74 million euros was allocated and 131 guarantees were issued. In 2006, the total of 5.63 million euros was allocated and 157 guarantees were issued, while in 2007, 10.65 million euros were allocated and 202 guarantees were issued. Analysing only loans for agriculture, the rise of 177% was recorded in 2007 as compared with the year 2006. It can be concluded that the Guarantee Fund directed all its activities to the development of agricultural production in the province. Major calls for applications announced by the Fund for the approval of guarantees for securing the loans were intended for financing of procurement of fertilizers and agricultural mechanisation. On the other hand, not one call for applications was announced for farming of animals. It is expected that opportunities for livestock sector development financing will be available in the coming years.

4.6.3 Provincial Agriculture Development Fund

Provincial Agriculture Development Fund was founded in 2001 with the aim to promote development of agriculture in the Province and alleviate problems through financing the programmes for development of certain agrarian sectors. During the observation period, the amount of 5.23 million euros was allocated for that purpose, 3.38 million euros of which represented the donation by the Kingdom of Norway for rehabilitation of the irrigation systems. The Fund concluded the agreement with the Provincial Secretariat for Agriculture, Forestry, and Water Management towards the end of 2001 for procurement of the sheep farming stock of «Suffolk» breed from Germany. Though currently neglected, larger investments in farming of animals are expected in the future period. Over the observation period from 2002 to 2007, the Fund was mainly engaged in irrigation systems financing, supply of new greenhouses, and among the recent projects—perennial vines of indigenous and other widely grown vines. For the greenhouses programme, 377,560 euros were allocated and 1.43 million euros for irrigation. Regarding farming of animals, with the exception of procurement of the sheep farming stock of «Suffolk» breed in 2001, the calls for applications for procurement of the sheep farming stock are expected to be announced in the autumn 2008. The only livestock-related call was for procurement of beehives and equipment for production, processing, and storage of honey in the maximum amount of 5,000 euro per application, which was open in the first half of 2008.

4.7 Agricultural co-operatives

The issue of concern in the co-operative sector is the absence of agricultural co-operatives operating according to widely recognised co-operative principles. Two characteristic types of agricultural co-operatives may be distinguished in our country with regard to manner of operations and management. The so-called “state co-operatives” managed by the employees, whereby farmers, as the co-operatives’ members have no rights whatsoever, and the so-called “private co-operatives”, operating as private enterprises, without observing co-operative principles. Yet another issue of equal importance relates to ownership of real property co-operative assets, thus hindering their development and regular operations.

In 2006, the new Law on Co-operatives came into effect. The Law provides for the establishment of agricultural co-operatives according to the following principles: voluntary and open membership, equity, equality, solidarity, democracy, education, training, and access to information of the members, co-operation among co-operatives, and others. However, this Law failed to increase operations of co-operatives in practice.

4.8 Foreign trade

Export of agricultural-food products depends on the volume and dynamics of domestic agricultural production, demand, state support, customs, and other non-tariff constraints in the importing countries. Some countries, particularly developed ones, are very closed and impose various import barriers. Different quantitative restrictions are more and more in use – in the form of technical barriers– implementation of ISO standards and HACCP methods for determining quality, as well as other quantitative and other restrictions as basic instruments of the agrarian protectionism measures. Export should become major driving force of economic development of Vojvodina. The share of finished products meeting requirements of the customers in importing countries should be substantially increased.

Sources used for analysis are statistical data of the Statistical Office of the Republic of Serbia – Foreign Trade Exchange per sections and divisions (SITC), for the period from 1996 to 2005. The analysis included sectors of primary agricultural productions and manufacturing sector products sections “0” (Food and live animals) and “1” (Beverages and tobacco), according to the Standard International Trade Classification (SITC). Thus, export and import of agro-industrial products have been considered as foreign trade exchange of the above-mentioned commodities.

4.8.1 Import of agricultural-food products

Average import in the period from 2001 to 2005, made 118.4 million dollars. In the import structure, the group vegetables and fruit accounted for the highest share of 23.8%, followed by animal feed with 19.3% and miscellaneous edible products and preparations with 10.6%.

Protection level of our agro-industry against foreign competition is very low. A large number of products, accounting for the highest import share (fruit, confectionery products, etc.) are practically not protected with import taxes. Negative trade balance is caused by trade liberalisation and various interventional import arrangements, such as agreements on long-term production co-operation, which also represent a form of import. A high share of export rates will have stronger negative impacts in the coming period, especially in farming of animals. Import of agricultural products should be complementary and in the function of production.

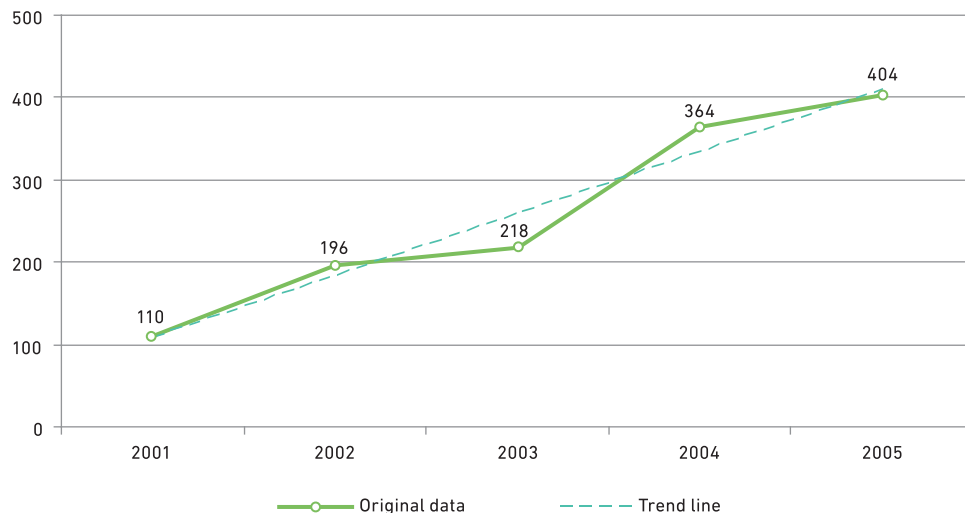
4.8.2 Export of agricultural-food products

Average annual export in the period from 2001 to 2005 reached 254.8 million dollars, showing a positive trend, at an average rate of 36.8% per annum (Chart 4.8.1). Absolute maximum was realised in the last year of the analysed period (400 million dollars).

The following commodity groups have the largest share in the export structure: Sugar, sugar preparations, and honey with 39.3%, Cereals and cereals preparations with 18.2% and Vegetables and fruit with 13.3%. The above-mentioned commodity groups had a predominant share in the total export of agricultural products from Vojvodina (70.8%). It is evident that not all commodity groups have equal position and importance in agricultural export of Vojvodina.

Economic co-operation in the South-East Europe is carried out based on free trade agreements. The agreements have been concluded in accordance with the Memorandum of Understanding on Trade Liberalisation and Facilitation, signed in Brussels in June 2001 within the Stability Pact for South East Europe (Albania, Bosnia and Herzegovina, Bulgaria, Macedonia, Moldova, Serbia and Montenegro, Romania and Croatia). On December 19th, 2006, a unique multilateral free trade agreement between the south-east European countries – CEFTA was signed in Bucharest. It can be concluded that CEFTA Agreement affected positively the growth in trade among the countries in the south-east European region. Export to the south-east European countries accounted for 16% of the total Vojvodina export in 2006. The lists of products for which customs duties will be lifted or reduced are made for agricultural products, while other products are subject to customs duty regime. The Agreement specifies that no new taxes on import or export of agricultural products will be imposed, including quantitative restrictions. As for sanitary and phyto-sanitary measures, the WTO rules shall apply.

Chart 4.8.1. Export of agro-industrial products from Vojvodina (2001–2005), in mill. US\$



4.8.3 Factors of agro-industrial products export growth

Comparative advantages of Vojvodina agro-industry must be fully utilised in the forthcoming period:

- ▶ Favourable agro-ecological conditions for production of wheat, oilseed crops, fruit and vegetables;
- ▶ Available Manufacturing sector capacities (edible oil plants, sugar plants, abattoir plants, dairy plants, industries for cereal grain, fruit and vegetable processing);
- ▶ Skilled personnel in both production facilities and research institutions.

All the above-mentioned factors, provided necessary government measures are in place, should be in the function of creating a stable export surplus of commodities meeting quality requirements of foreign markets. To this end, adequate economic measures must be formulated to assist the revival of the entire agricultural production, being a necessary precondition for export growth. Through corresponding subsidy policy based on the real financing sources, export of agricultural-food products should be subsidised on a larger scale. Namely, if domestic price is higher than the world price, the difference should be covered by export subsidy. Export subsidies accounted for three percent of the total agrarian budget in Serbia in 2006. These are rather moderate funds to assist export growth and equal "fight" on the world market with highly-subsidised products, especially from the EU. The state aid is indispensable to facilitate overcoming the barriers in international trade.

Economic policy measures in this area have to take into account all specific features of agricultural production (e.g. slow turnover of capital, etc.), and should support export orientation. At the same time, production must be enlarged and stabilised to create export surplus of commodities meeting quality requirements of foreign customers.

Export potentials of Vojvodina agriculture include:

- ▶ Sugar and confectionery products
- ▶ Edible sunflower oil
- ▶ Wheat and corn, mercantile and seed
- ▶ Soya and sunflower, seed.
- ▶ Quality fruit, raw and processed (sour cherry, strawberry, apple, apricot)
- ▶ Quality vegetables, mostly raw (and smaller portion of and processed vegetable – frozen peas, string beans, sweet corn, mushrooms, raw and marinated and the like)
- ▶ Beef cattle for slaughter, beef meat, lambs for slaughter, lamb meat Quality meat products (ham and pork shoulder, foil pack and canned, etc.)
- ▶ Beer, non-alcoholic beverages, sparkling water, wine.
- ▶ Non-conventional agricultural products – frogs, snails, honey, medicinal herbs, etc.

Special attention should be devoted to the production and export of healthy safe food for which we have all necessary agro-ecological resources and potentials. Healthy Safe Food is produced within organic agriculture and processing, with the exclusion of artificial chemicals (fertilisers, pesticides, growth promoters, hormones, etc.), and genetically modified organisms. The creation of the recognised trademark – “made in” should be a must, as a guarantee of high-quality product.

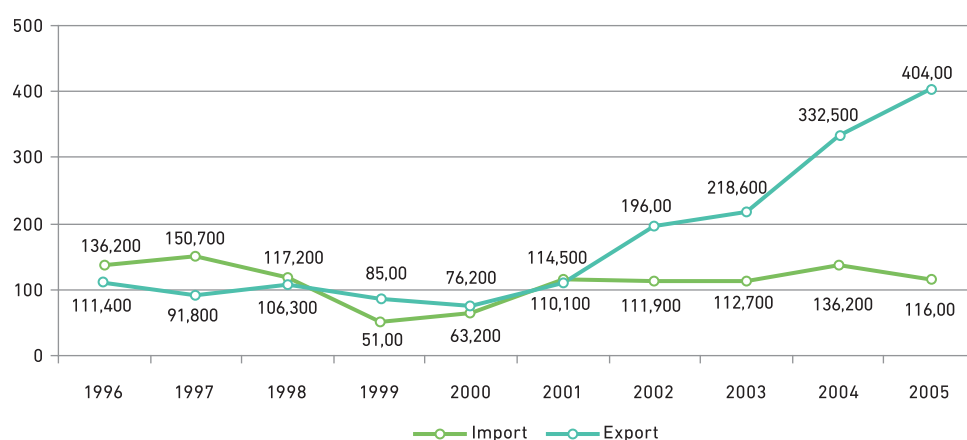
4.8.4 Foreign trade balance

The average foreign trade balance of agricultural-food products in Vojvodina was positive in the observation period, totalling to 65 million dollars. Developments in export and import of agricultural-food products are shown in Chart 4.8.2. Such a balance of trade may be considered as very good, but not satisfactory. In the forthcoming period, export should be increased and the current level of import maintained.

The analysis of foreign trade balance by commodity groups shows the following:

- ▶ Commodity groups with positive trade balance are: Meat and meat preparations, Cereals and cereal preparations, Vegetables and fruit, Sugars, sugar preparations and honey, Miscellaneous edible products and preparations and Tobacco and tobacco manufactures. Commodity group Sugar, sugar preparations and honey with 41.9 million dollars has the highest positive trade balance.
- ▶ Other commodity groups recorded higher import than export, that is, negative trade balance. Commodity group Feeding stuff for animals with 11.5 million dollars has the highest negative trade balance.

Chart 4.8.2. Export and import developments in Vojvodina in the period from 1996 to 2005, in mill. US\$.



4.9 Competitiveness assessment - SWOT analysis

Developmental strengths of agriculture in Vojvodina	Weaknesses
<ul style="list-style-type: none"> ▶ Favourable natural conditions for production (soil, climate, water resources) ▶ Comparative advantages of micro regions (Fruska Gora mountains, Subotica sands, Vrsac mountains), ▶ Relatively non-polluted environment and agricultural resources, ▶ Excellent conditions for development of multifunctional agriculture (favourable natural resources for development of tourism and hotel industry, energy generation (wind, thermal, renewable sources)), ▶ Tradition in conventional agricultural production, ▶ Relatively skilled and educated labour force, ▶ Developed processing capacities, ▶ Existence of educational and scientific-research institutions, ▶ Readiness of provincial institutions for agro-complex development, ▶ Existence of agricultural counselling services. 	<ul style="list-style-type: none"> ▶ Land reform and farm restructuring not completed ▶ Fragmented agricultural holdings. ▶ Extensive production according to structure and yields. ▶ Low share of farming of animals. ▶ Poorly managed use of state-owned land ▶ Inefficient use of water resources for irrigation purposes. ▶ Poor management of small holding family farms. ▶ Insufficient government support to agriculture development. ▶ Elderly households and rural depopulation issues.
Developmental opportunities	Threats to development
<ul style="list-style-type: none"> ▶ Land reform and farm restructuring ▶ Increased areas under irrigation. ▶ Intensification of growing of crops through changes in the production structure and investments in specific production lines. ▶ Improved utilisation of soil through stubble mulch tillage and additional tillage. ▶ Intensification of farming of animals. ▶ Higher level of product finalisation through improved utilisation of processing capacities. ▶ Enhancing of processing technology for agricultural products ▶ Development of multifunctional production and production diversification (with the exception of food production, agricultural resources in Vojvodina can be efficiently used to develop agro-eco tourism (rural tourism, spa and health tourism, fishing and hunting tourism), hotel-catering industry (farm based, healthy food, etc), energy generation (wind, thermal, renewable sources). ▶ SMEs development for craft processing of agricultural products. ▶ Integration of production, processing, and sale through co-operatives. ▶ Implementation of ISO standards and improved products quality. ▶ Increased production of rapeseed and construction of bio fuel refineries. ▶ Development of ecological production, production of medicinal and aromatic herbs. ▶ Improved efficiency of counselling services and other institutions. 	<ul style="list-style-type: none"> ▶ Sales restrictions. ▶ Export restrictions (quotas, non-tariff barriers, non-subsidised export,...) ▶ Insufficient state capacity to support development of agriculture. ▶ Lack of quality funding sources for development and operations. ▶ Non-existent or inadequate legislation. ▶ Insufficient institutional capacity for development.

4.10 Conditions and measures for strengthening of competitiveness of agri-business

The most important conditions and support measures for the rural agri-business development in rural areas in Vojvodina are:

- To support construction and use of irrigation systems
- To support investments in rural regions
- Management of land resources and economics of land use
- Infrastructure and institution development in rural areas
- State and local self-government investments in the rural enterprise development
- Strengthening of agri-business and entrepreneurship development institutions
- Rural population education
- Agricultural co-operatives and agricultural counselling services development

Despite abundant water resources in Vojvodina, they are poorly utilised. This is partly due to economic reasons. Fees charged by relevant water authorities are very expensive for agriculture, and their services are of low quality. Despite the existing primary canal network, the use of water resources for agricultural needs is symbolic. Republic and provincial funds for development of agriculture should provide more credit supports, under more favourable conditions, for the purchase of irrigation systems and equipment. Special fiscal policy measures, such as tax exemptions, should be specified for agricultural holdings using irrigation systems to subsidise fee charged by relevant water authority for the use of water for irrigation.

Support measures aimed at development of rural areas, should include payroll tax exemption or reduction of contributions for new hires in rural areas, more favourable taxation and credit policy, state and local self-government financial incentives to agri-business development.

Management of land resources and economics of land use are an issue of immediate concern in Vojvodina agriculture. Delay in privatisation of state-owned land and adopting the Law on restitution of state-owned land in municipalities have caused huge problems and damage to agriculture.

Infrastructure and institution development (roads, water supply and sewage networks, telecommunications, kindergartens, schools, banks, sport grounds, cultural and other institutions) are of particular importance for the development of rural areas. Foreign loans and grants may be valuable sources to this end.

Agricultural land, as a state-owned resource, should represent the basis for setting priorities in the National Investment Plan of Serbia. It means that besides investments in winter tourism, ski terrains, and ski lifts, Serbia should make investments to allow the optimum use of agricultural land, through the development of agricultural enterprises, experimental stations, scientific institutes, tourist attractions, and other profitable ways of multifunctional agricultural land use.

Institutions play a special role in agri-business and entrepreneurship development worldwide. As regards the agri-business, special attention is to be paid to investments in resolving of technological issues, guarantee funds and counselling services for agri-business development.

Economic development of rural areas must be followed by the general social development, i.e. general education of rural population as well as technical, technological, educational, cultural, ecological and last, but not least, general economic education. Hence, agricultural co-operatives and agricultural counselling services as institutions entrusted with the task to harmonise state and farmers objectives and pursue implementation of agrarian policy are of great importance for the survival and development of small family farms.

Relatively favourable credit lines for farming of animals development will not give positive effects without the introduction of economic instruments aimed at market regulation and protection against unfair competition from abroad and establishment of primary producer organisations.

Manufacturing sector and development of small and medium-sized enterprises in agri-business are the most important driving forces for the development of primary agricultural production. Branches of food industry investing in their raw material base (dairy, sugar, edible oil, and soy processing plants) have recorded a particularly marked growth rate of production, and capacity utilisation in recent years. Food industry should upgrade its processing technology, implement ISO standards, improve production and product quality, and increase inputs in its raw material base in order to increase capacity utilisation rate, enhance product quality, secure unrestricted export to the EU countries, and strengthen its competitiveness at the world market. Food industry development shall affect positively the development of primary agricultural production and its raw material base.

SME development in the field of craft processing of agricultural products (through entrepreneurship development, larger farm holdings should increase finalisation degree of their own products (pickled and preserved vegetables to be eaten during winter months, dry products, souvenirs, catering). Development of small and medium-sized enterprises ought to be compatible with food industry, ecological production, and tourism development. Integration of production, processing and sale through co-operatives and SME development, should provide enhanced efficiency to individual farmers. For SME development, the assistance

of local self-governments is required through tax and fiscal policy and re-activation of the existing, but not used, processing capacities. Through enhanced capacity utilisation level, production efficiency will be raised (lower costs per unit), and through increased total volume, the production effectiveness will be also improved. Positive effects achieved in that way will be manifested in the development of primary agricultural production employment growth,

Improved soil utilisation through stubble mulch and additional tillage. Irrigation practices provide conditions for better soil utilisation and, hence, more harvests per year. This leads to increased turnover of capital in agriculture, more intensified agricultural production, efficient use of the means of production (mechanisation, labour), reduced product costs per unit, and improved production efficiency and effectiveness, and better conditions for farming of animals development. Intensification of farming of animals (increased number of heads and more intense levels of investment in cattle, swine, sheep, and poultry production to reach the European standards), will contribute to intensification of the total agricultural production. Such improvements may be facilitated by state intervention and pooling production resources of the farmers, as in the dairy.

Vojvodina has excellent conditions for the development of agro-eco tourism, such as, developed agricultural production, cultural heritage, and abundance in rivers, lakes, and streams. These are prerequisites for the development of farm-based rural tourism, catering industry based on the offer of healthy food and drinks, original handicrafts, traditional Vojvodina cuisine and holidays on farms or the banks of rivers and lakes.

Yet another measure for improvement of economic efficiency and effectiveness of agriculture is the development of medicinal and aromatic herbs production. Rapeseed production and bio-diesel refineries could play an important role in the future development of agriculture, since renewable energy production is at the forefront of the global development agenda. For this domestic and foreign investment funds are needed as well as stronger marketing approach.

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