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# AVAILABLE AGRICULTURAL AREAS AND OWNERSHIP STRUCTURE OF HOLDINGS IN THE REPUBLIC OF SERBIA

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## ABSTRACT

The subject of research in this paper is the analysis and presentation of data on agricultural holdings, the structure of available and utilized area. The main goal is to determine and explain more comprehensively and in detail, by using appropriate methods, and based on available data, the condition of utilized agricultural area and its characteristics by utilization categories and ownership structure of holdings. The importance of this research arises from the fact that the results on utilized agricultural area can be used to adopt appropriate measures and undertake certain activities in land and overall agricultural and rural policy related to sustainable utilization, arrangement and protection of agricultural land and more balanced integrated development of rural areas, as well as to find better solutions in the field of utilization, ownership sector and conditions of agricultural area management.

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## Introduction

Starting from the fact that the data on the structure of the agricultural holdings play a key role in implementation and monitoring the agricultural policy of the European Union (EU), The Statistical Office of the Republic of Serbia (hereinafter: the Office) planned, organized and conducted the “Agricultural farms structure survey (hereinafter: the Survey) in 2018” The survey was conducted on a sample that included 121,070 agricultural holdings. It was funded from the budget of the Republic of Serbia and from the pre-accession funds of the European Union, within the IPA 2016 project (Instrument for Pre-accession Assistance, 2016). The survey is a nationally significant, organizationally and programmatically very comprehensive activity of the Office in the field of agriculture. The obtained data will serve for the creation of the national agrarian policy, and for providing the basis for the functioning of the system of agricultural statistics. Applied instruments, coverage, features and standardization of concepts and definitions are in line with the recommendations of the World Programme for the census of Agriculture (UN-FAO), the European Parliament Regulations on conducting

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the Farm Structure Survey and Survey on Agricultural Production Method (*Regulation [EC] No 1166/2008 of the European Parliament and of the Council of 19. November 2008, on farm structure surveys and survey on agricultural production methods; Regulation [EC] No 1200/2009, Regulation [EU] No 715/2014*), Eurostat methodology and valid domestic regulations. Besides the agricultural census, the Survey is a key research that collects internationally comparable data on the funds and structure of agricultural holdings.

An important segment of the analysis of the collected data is the analysis of available agricultural land by categories of utilization and the ownership structure of holdings in the Republic of Serbia, in 2018. The results of such an analysis are intended for the wider scientific and professional public, with the desire to expand agro-economic and statistical analysis of the utilization, arrangement and protection of agricultural land in Serbia - especially by municipalities and areas (Đorđević, et al 2011). The presented results can be significant indicators by which the state and local government will be able to define the problems of agricultural activity more adequately and accordingly plan and make appropriate decisions and take appropriate measures for development, both at the local and state level (Petrović, Miladinović, Novakov, 2007) .

### **Materials, methods, goals and significance of the research**

The subject of research in this paper is the analysis and presentation of data on agricultural holdings, the structure of available and utilized area. Main goal of this research is to determine and explain more comprehensively and in detail, and based on available databases, professional literature and legislation, using appropriate methods, the condition of *utilized agricultural area* (hereinafter: UAA) and its quantitative and qualitative characteristics – in total and by types of *agricultural holdings* (hereinafter: AHs) – *family agricultural holdings* (FAHs) and *agricultural holdings of legal entities and entrepreneurs* (AHLEEs), by statistical regions and lower statistical units of data grouping (districts and municipalities). The justification of such a defined goals stems from the knowledge that the current tendencies and the current situation in the management of agricultural area in general, and especially arable land and areas under orchards and vineyards (Todić, 2019), as production-significant utilization categories of agricultural area, are considered sporadically, without critical consideration of responsibility of their owners and/or users.

Implementation of such a defined basic research goal indicates necessity of more detailed and continuous study of the causes that led to the reduction of available agricultural land and especially its better and more important production categories of utilization (Tomić, Njegovan, 2013).

The importance of this analysis stems from the possibility to point out to the scientific and professional public, competent state institutions, owners and/or users of agricultural area, the need to utilize, arrange and protect agricultural area in Serbia in accordance with the principle of sustainability (Trivić, 2019).

The significance of this research stems from the fact that the results of the analysis of *utilized agricultural area* can be used to adopt appropriate measures and undertake certain activities in land and overall agricultural and rural policy (Bogdanov, 2007) related to sustainable use, arrangement and protection of agricultural area and more even integrated development of rural areas (European Commission, 2012), as well as to find better solutions in the field of utilization, ownership sector and conditions of agricultural land management.

## Results

The starting point and backbone of all the observed parameters is precisely the structure of *agricultural holdings* AHs in Serbia. The results show that there were a total of 564,542 AHs in Serbia in 2018, of which 562,895 were *family agricultural holdings* (FAHs), only 1,375 agricultural holdings of legal entities (AHLEs) and 272 agricultural holdings of entrepreneurs (AHEs). It can be concluded that the total number of agricultural holdings is dominated by FAHs (99.71%).

**Table 1.** Basic indicators on the number and size of AH in the Republic of Serbia, 2018

Holdings	All AHs		AHs without land		UAA		
	number	%	number	$\Sigma=100$	ha	%	ha/AH
FAH	562 895	99.71	5 180	97.92	2 916 125	83.90	5.18
AHLE	1 375	0.24	70	1.32	557 866	16.05	405.72
AHE	272	0.05	40	0.76	1 903	0.05	7.00
All AHs	564 542	100.00	5 290	100.00	3 475 894	100.00	6.16

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

AHLEEs are minor in number (only 0.24% and 0.05%), but this group has a significant share in UAA and a large average area of property, so it can be concluded that they are significant production and economic entities in Serbian agriculture. However, at the same time, their participation in the NUAA is relatively large.

**Table 2.** Agricultural holdings with the status of legal entity, by regions

	number of holdings	AHs					
		FAHs		AHLEEs			
		number	%	AHLEs		AHEs	
				number	%	number	%
REPUBLIC OF SERBIA	564 542	562 895	100.00	1 375	100.00	272	100.00
<b>SERBIA – NORTH</b>	157 104	156 138	27.74	855	62.18	111	40.81
Belgrade Region	30 033	29 949	5.32	75	5.45	9	3.31
Vojvodina Region	127 071	126 189	22.42	780	56.73	102	37.50
<b>SERBIA – SOUTH</b>	407 438	406 757	72.26	520	37.82	161	59.19
Šumadija and West Serbia Region	242 636	242 224	43.03	300	21.82	112	41.18
South and East Serbia Region	164 802	164 533	29.23	220	16.00	49	18.01
Kosovo Region	...	...	...	...	...	...	...

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

Regionally, the largest number of FAHs is in the region of Šumadija and Western Serbia (42.97%). This region has the largest number of agricultural holdings of entrepreneurs AHEs (41.2%), while the largest number of AHLEs is in the Region of Vojvodina (56.0%).

**Table 3.** Available land per utilization categories in the Republic of Serbia, 2018.

	AL					
	total	agricultural land			Woodland area	other
		all	UAA	NAAA		
Area [ha]	5 178 692	3 765 847	3 475 894	289 953	972 283	440 562
Structure [%]	100.00	72.72	67.12	5.60	18.77	8.51

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

The structure of available land per utilization categories in Serbia is strongly dominated by UAA (67.12%) – which makes a total of 72.2% of available agricultural land together with NAAA (5.60%). It is followed by woodland (18.77%) and other land (8.51%) (Table 3). If we take into account the significant differences in the categories of available land by region, it is desirable to look at this structure of the UAA and NAAA and by districts.

**Table 4.** Available land per districts in the Republic of Serbia, 2018.

	UAA		NAAA		Woodland area		Other land		AL total
	ha	%	ha	%	ha	%	ha	%	ha
REPUBLIC OF SERBIA	3 475 894	67.12	289 953	5.60	972 283	18.77	440 562	8.51	5 178 692
<b>SERBIA – NORTH</b>	1 719 899	76.56	76 982	3.43	158 199	7.04	291 414	12.97	2 246 494
Belgrade Region	145 533	55.26	12 340	4.69	30 648	11.64	74 820	28.41	263 340
Vojvodina Region	1 574 366	79.39	64 643	3.6	127 551	6.43	216 594	10.92	1 983 154
<b>SERBIA – SOUTH</b>	1 755 995	59.89	212 971	7.26	814 084	27.76	149 148	5.09	2 932 198
Šumadija and Western Serbia Region	1 035 998	60.93	76 055	4.47	519 487	30.55	68 708	4.04	1 700 248
Southern and Eastern Serbia Region	719 997	58.4	136 916	11.11	294 597	23.91	80 440	6.53	1 231 950
Kosovo and Metohija Region	...	...	...	...	...	...	...	...	...

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

Differences in the representation of the UAA in certain regions range from only 58.44% in the Region of Southern and Eastern Serbia to 79.39% in the Region of Vojvodina. Significant differences in the representation of NAAA are evident, ranging between 11.11% in the Region of Southern and Eastern Serbia to 3.26% in the Region of Vojvodina. The differences are even greater at the district level. NAAA ranges from 1.17% (Srem District) to 22.78% (Pilot District). Thus, the share of UAA by

regions is between only 58.44% in the Region of Southern and Eastern Serbia (where landowners left their properties in large numbers) to as many as 79.39% in the Region of Vojvodina, which is the richest region in Serbia in terms of AL and benefits for agricultural production (Lovre, Zekić, 2008).

There are also significant regional differences in the representation of woodland by districts (Pantić, Živanović Miljković, 2010). Areas covered by woodland comprise 18.77% of the total AL in the Republic of Serbia. At the level of the defined areas, the share of areas covered by woodland in the total AL ranges from 0.07% (North Banat District) to 39.58% (Zlatibor District). However, in relation to the above-mentioned average indicators for Serbia, regional differences in the structure of AL by utilisation categories point to the following statements:

*First*, the dominant share of the UAA in the total AL is characteristic for all four statistical regions, with the representation of the UAA in Vojvodina Region being significantly above (79.39%), and in all three regions in central Serbia the representation is relatively uniformed and significantly below the national average and ranges from 55.26% in the Belgrade region, 60.93% in the Region of Šumadija and Western Serbia and 58.44% in the Region of Southern and Eastern Serbia;

*Second*, the difference between the total AL and UAA indicates a significant representation of one or two of the three individual utilisation categories, namely:

- *other land* comprises approximately one third of available land in Belgrade region (28.41%);
- *other land* is significantly represented in the structure of the AL of the Region of Vojvodina (10.92%);
- woodland area comprises 30.55% of AL of Šumadija and Pomoravlje;
- cumulatively shown categories of *woodland* (23.91%) and *NUAA* (23.91%), comprise about one third of the available land in the Region of Southern and Eastern Serbia (Table 4.)

A significant aspect of the analysis of AL by utilisation categories is also the analysis of the relationship between UAA and NUAA by the legal status of holdings (Lovre, 2013). The majority of AL belongs to FAHs (73.58%), and 26.42% to AHLEEs. However, the share of FAHs in utilized area is 83.90%, and AHLEEs only 16.10%. The share of FAHs in NUAA is 35.80%, and AHLEEs even 64.20%. FAHs also has a dominant share in the category of woodland area (72.57%), and AHLEEs owns only 27.43% of woodland.

**Table 5.** AL by utilization categories and legal status of holdings in the RS, 2018

		AL				
		total	UAA	NAA	Woodland area	Other
		All agricultural holdings AHs				
Area	ha	5 178 692	3 475 894	289 953	972 283	440 562
	%	100.00	67.12	5.60	18.77	8.51
Holdings	number	564 542	559 252	109 115	360 662	492 912
	%	100.00	99.06	19.33	63.89	87.31
Average	ha/AH	9.17	6.22	2.66	2.70	0.89
	%	100.00	67.75	28.97	29.39	9.74
		AL				
		total	UAA	NAA	Woodland area	Other
		Family agricultural holdings FAHs				
Area	ha	3 810 550	2 916 125	103 815	705 567	85 042
	%	100.00	76.53	2.72	18.52	2.23
Holdings	number	562 895	557 715	108 727	360 320	492 083
	%	100.00	99.08	19.32	64.01	87.42
Average	ha/FAH	6.77	5.23	0.95	1.96	0.17
	%	100.00	77.23	14.11	28.93	2.55
		Share FAHs (all AHs=100)				
Area	%	73.58	83.90	35.80	72.57	19.30
all FAHs	%	99.71	99.73	99.64	99.91	99.83
		Agricultural holdings of legal entities and entrepreneurs AHLEEs				
Area	ha	1 368 142	559 769	186 138	266 716	355 520
	%	100.00	40.91	13.61	19.49	25.99
Holdings	number	1 647	1 537	388	342	829
	%	100.00	93.32	25.24	88.14	242.40
Average	ha/AHLEE	830.69	364.20	479.74	779.87	428.85
	%	100.00	43.84	57.75	93.88	51.63
		Share AHLEEs (all AHs=100)				
Area	(%)	26.42	16.10	64.20	27.43	80.70
all AHLEEs	(%)	0.29	0.27	0.36	0.09	0.17

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

Utilized agricultural area of the total available FAHs land is 76.53%, and unutilized is 2.72%. However, the utilized area of AHLEEs is only 40.91%, and the unutilized area is 13.61% of the available land of this group of holdings.

**Table 6.** Available land by utilization categories and legal status of holdings

	All AHs	FAHs	AHLEEs
AL	5 178 692 ha	3 810 550 ha (73.58%)	1 368 142 ha (26.42%)
UAA	3 475 894 ha	2 916 125 ha (83.90%)	559 769 ha (16.10%)
ha/ AH	6.22 ha/AH	5.23 ha/FAH	364.2 ha/AHLEE
NUAA	289 953 ha	103 815 ha (35.8%)	186 138 ha (64.2%)
ha/ AH	2.66 ha/AH	0.95 ha/FAH	479.7 ha/AHLEE
Woodland	972 283 ha	705 567 ha (72.5%)	266 716 ha (27.43%)
ha/ AH	2.7 ha/AH	1.96 ha/FAH	779.87 ha/AHLEE

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

If we take into account the size of AHLEEs property and their large share in the total AL, the following can be concluded:

1. The average size of AH property in Serbia is only 6.22 ha/AH UAA. The regional analysis of this indicator points out that only holdings in the Region of Vojvodina are with an above-average area of property (12.71 ha/AH or 2.04 times higher) - which is the result of the concentration of the largest number by area of significantly larger AHLEEs. In contrast, holdings properties in all three other regions are lower than the national average: 4.89 ha/AH in the Belgrade region, 4.28 ha/AH in the Šumadija and Western Serbia Region and 4.40 ha/AH in the Southern and Eastern Serbia Region.
2. Legal entities and entrepreneurs comprise only 0.29% of the total number of AHs, but they have 26.42% of the total AHs at their disposal; their share in UAA is 16.10%, and in NUAA 64.20%.
3. AHLEEs are relatively few (1 647), but have a significant average size of property of 364.2 ha of utilised and even 479.74 ha of NUAA and 779.87 ha of woodland.

AHLEEs have at their disposal even 186,138 ha or 64.20% of the total NUAA in Serbia, which indicates the need for a detailed analysis of the management of agricultural land owned and utilised by this group of entities (Ševarlić, 2015).

## Discussions

The results show that there are significant differences between the three *ownership subgroups* of all holdings, and they are reflected in the large disproportion of their representation in the total number of holdings and the total area of the UAA. From this point of view, all AHs can be classified into three relatively homogeneous groups of holdings by size of the property - *small* ("less than 5 ha"), *medium* ("5-20 ha") and *large* ("more than 20 ha"). The analysis of the ownership structure according to the share of the defined three collective groups of AHs indicates certain characteristics, as follows:

- *AHs with smaller property* - is a group in which the dominant part is concentrated, even 71.74% of the total number of AH in Serbia, and they utilise only 23.24% of the total UAA;

- *AHs with medium size of property* and comprise 24.29% of the total number of AHs, and utilise 35.14% of the total UAA;
- *AHs with larger property* comprise 3.96% of the total number of holdings, and utilise 41.62% of the total UAA.

Regional analysis of the ownership structure of FAHs indicates significant differences in the ownership structure in four statistical regions in Serbia, which are reflected in the following statements:

**Table 7.** Ownership structure of FAHs in the Republic of Serbia by regions

Indicators		Total	Without land	< 5 ha	5,01-20 ha	>20 ha
REPUBLIC OF SERBIA						
All FAHs	number	562 895	5 180	399 271	136 838	21 606
	%	100.00	0.92	70.93	24.31	3.84
UAA	ha	2 916 125	0	806 971	1 218 203	890 951
	%	100.00	0	27.67	41.77	30.55
Belgrade Region						
FAHs	number	29 949	265	23 069	6 035	580
	%	100.00	0.88	77.03	20.15	1.94
UAA	ha	118 872	0	45 131	51 237	22 504
	%	100.00	0.00	37.97	43.10	18.93
Share of the Belgrade Region (RS=100)						
All FAHs	%	5.32	5.12	5.78	4.41	2.68
UAA	%	4.08	0.00	5.59	4.21	2.53
Vojvodina Region						
FAHs	number	126 189	3 128	70 140	37 813	15 106
	%	100.00	2.48	55.58	29.97	11.97
UAA	ha	1 168 428	0	122 094	382 918	663 416
	%	100.00	0.00	10.45	32.77	56.78
Share of the Vojvodina Region (RS=100)						
All FAHs	%	22.42	60.39	17.57	27.63	69.92
UAA	%	40.07	0.00	15.13	31.43	74.46
Šumadija and West Serbia Region						
FAHs	number	242 224	740	179 730	58 533	3 221
	%	100.00	0.31	74.20	24.16	1.33
UAA	ha	985 301	0	386 710	495 038	103 553
	%	100.00	0.00	39.25	50.24	10.51
Share of the Šumadija and Western Serbia Region (RS = 100)						
All FAHs	%	43.03	14.29	45.01	42.78	14.91
UAA	%	33.79	0.00	47.92	40.64	11.62
South and East Serbia Region						
FAHs	number	164 533	1 047	126 331	34 456	2 699
	%	100.00	0.64	76.78	20.94	1.64



Indicators		Total	Without land	< 5 ha	5,01-20 ha	>20 ha
UAA	ha	643 525	0	253 035	289 012	101 478
	%	100.00	0.00	39.32	44.91	15.77
Share of the Southern and Eastern Serbia Region (RS=100)						
All FAHs	%	29.23	20.21	31.64	25.18	12.49
UAA	%	22.07	0.00	31.36	23.72	11.39
Kosovo and Metohija Region						

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

FAHs larger than 20 ha are dominant in the Region of Vojvodina (69.91% of the total number of holdings of this size in the Republic of Serbia) and utilize 74.46% of land in the group of larger properties. Representation of FAHs larger than 20 ha in the Belgrade region is 2.68%, in the region of Šumadija and Western Serbia 14.91%, and in the region of Southern and Eastern Serbia 12.49% of the holdings of this group.

The largest part of FAHs with a holding of up to 5 ha and FAHs with a holding of medium size (5–20 ha) is in the Region of Šumadija and Western Serbia (over 45%). In the Region of Southern and Eastern Serbia, FAHs with a property of up to 5 ha (31.64%) are dominant, and holdings with a property of over 20 ha have almost negligible share in the total number of FAHs.

The general conclusions of the regional analysis of the ownership structure between collective groups of FAHs in Serbia are:

1. **small holdings** (“up to 5 ha”) are dominant in the total number of FAHs in all four statistical regions (between 55.58% in the Region of Vojvodina and 77.03% in the Belgrade region), and are in second place in terms of representation in total UAA in all regions (37.97% in the Belgrade region and 39.32% in the Region of Southern and Eastern Serbia), while in the region of Šumadija and Western Serbia this group of FAHs utilize 39.25% of the total UAA of the region, and in the Region of Vojvodina have the lowest share in the UAA (10.45%);
2. **large holdings** (“over 20 ha”) are the least represented in the total number of FAHs in all four regions (between 1.33% in the Region of Šumadija and Western Serbia to 11.97% in the Region of Vojvodina); they are least represented in the UAA in three regions (between 10.51% in the region of Šumadija and Western Serbia and 18.93% in the Belgrade region), while in the region of Vojvodina they are the dominant group in the UAA - they utilize 56.78% of the UAA region.
3. **medium holdings** (“5–20 ha”) are between small and large holdings in terms of representation in the number of FAHs in all four regions (between 20.15% in the Belgrade region and 29.97% in the Vojvodina region); representation in the UAA is 32.77% in the Region of Vojvodina and 44.91% in the Region of Southern and Eastern Serbia, and in the Region of Šumadija and Western Serbia they are the most represented, with 50.24% of the UAA.

The distribution of AHLEEs and their UAA by regions in Serbia points to the following observation:

**Table 8.** Ownership structure of AHLEEs in the Republic of Serbia by regions

Indicators		Total	Without land	< 5 ha	5,01-20 ha	>20 ha
REPUBLIC OF SERBIA						
All AHLEEs	number	1 647	109	464	300	774
	%	100.00	6.62	28.17	18.21	46.99
UAA	ha	559 769	0	834	3230	555 705
	%	100.00	0	0.15	0.58	99.27
Belgrade Region						
AHLEEs	number	83	6	27	18	32
	%	100.00	7.23	32.53	21.69	38.55
UAA	ha	26 661	0	55	198	26 408
	%	100.00	0.00	0.21	0.74	99.05
Share of the Belgrade Region (RS=100)						
All AHLEEs	%	5.04	5.50	5.82	6.00	4.13
UAA	%	4.76	0.00	6.59	6.13	4.75
Vojvodina Region						
AHLEEs	number	883	45	151	153	534
	%	100.00	5.10	17.10	17.33	60.48
UAA	ha	405 938	0	271	1686	403 981
	%	100.00	0.00	0.07	0.42	99.52
Share of the Vojvodina Region (RS=100)						
All AHLEEs	%	53.61	41.28	32.54	51.00	68.99
UAA	%	72.52	0.00	32.49	52.20	72.70
Šumadija and West Serbia Region						
AHLEEs	number	412	37	199	85	91
	%	100.00	9.02	48.23	20.69	22.05
UAA	ha	50 697	0	355	863	49 479
	%	100.00	0.00	0.70	1.70	97.60
Share of the Šumadija and Western Serbia Region (RS = 100)						
All AHLEEs	%	25.02	33.94	42.89	28.33	11,76
UAA	%	9.06	0.00	42.57	26.72	8.90
South and East Serbia Region						
AHLEEs	number	269	21	86	44	118
	%	100.00	7.95	31.82	16.22	44.01
UAA	ha	76 472	0	153	482	75 837
	%	100.00	0.00	0.20	0.63	99.17
Share of the Southern and Eastern Serbia Region (RS=100)						
All AHLEEs	%	16.34	20.01	18.48	14.56	15.24
UAA	%	13.61	0.00	18.36	14.92	13.60
Kosovo and Metohija Region						

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

Without land is 109 AHLEEs of the total listed AHLEEs (1,647) or 6.62%, which is a significant percentage in relation to the total number of AHs (in the Region of Southern and Eastern Serbia 20.01%, and in the Region of Šumadija and Western Serbia 33.94% of the total number of AHLEEs without land). In all regions, AHLEEs with a property of more than 20 ha utilize the largest part of the land available to this group of holdings. The analysis of the ownership structure of the AHLEEs in four statistical regions in Serbia, according to the representation of three collective groups of holdings with a certain size of property, indicates the following regional differences:

**Small holdings** dominate in the total number of holdings, and are minor in the total UAA holdings of legal entities and entrepreneurs in three regions - Belgrade (32.53% of AHLEEs of this region and 0.21% of UAA of AHLEEs), in the Region of Šumadija and Western Serbia (48.23% of AHLEEs of this region and 0.70% of UAA of AHLEEs of the region) and Southern and Eastern Serbia (31.82% of AHLEEs and 0.20% of UAA of AHLEEs), while in the Region of Vojvodina the representation is in the number of holdings (17.10% of AHLEEs), and the least represented are in UAA (0.07% of UAA of AHLEEs of this region);

**Large holdings** dominate in the total of UAA and are differently represented in the total number of AHLEEs in all four statistical regions - in the Belgrade region this group makes 38.55% of AHLEEs region and 99.05% of UAA of AHLEE of this region, in Vojvodina this group is 60.48% of AHLEEs and 99.52% of UAA of AHLEEs region, in Šumadija and Western Serbia they comprise 22.05% of AHLEEs and 97.60% of UAA of AHLEEs, and in Southern and Eastern Serbia 44.01% of AHLEEs and 99.17% of UAA of AHLEEs of this region;

**Medium holdings** are relatively more represented in the total number, and minor in the total of UAA of AHLEEs in all four statistical regions - in the Belgrade region this group of holdings comprises 21.69% of AHLEEs and utilizes 0.74% of UAA of AHLEEs of this region; in the Region of Vojvodina 17.33% are AHLEEs and utilize 0.42% of UAA of AHLEEs of this region; in the region of Šumadija and Western Serbia 20.69% of AHLEEs is this group of holdings and they utilize 1.70% of UAA of AHLEEs of this region, in the Region of Southern and Eastern Serbia this group comprises 16.22% of AHLEEs and utilizes 0.63% of UAA of AHLEEs of this region.

**FAHs** are dominant in the total number of holdings (99.71%) and, at a slightly lower level, in the total number of UAA (83.84%).

*FAHs with smaller property* are dominant in the total number of FAHs in all four statistical regions - 70.95% of the total number of FAHs, and their share in the UAA is only 27.67%. This result suggests a **large fragmentation of FAHs properties**.

*FAHs with a medium size of property* comprise 24.31% of the total number of FAHs, and the share in UAA is 41.77%. The largest part of FAHs with medium-sized property is in the Region of Šumadija and Western Serbia (over 45%).

**FAHs with larger property** comprise only 3.84% of FAHs, and their share in UAA is 30.57%. So the number of large FAHs is small, but they utilize one third of the FAHs land.

**Large holdings** are the least represented in the total number of FAHs in all four regions; in the Region of Vojvodina and the dominant group in the UAA, utilize 56.78% of the UAA region.

**Table 9.** Regional analysis of the ownership structure of FAHs collective groups in Serbia

Region	Small holdings up to 5 ha		Medium holdings 5 – 20 ha		Large holdings over 20 ha	
	Share in the number of FAH	Share in UAA	Share in the number of FAH	Share in UAA	Share in the number of FAH	Share in UAA
Belgrade Region	77.03%	37.97%	20.15%	43.10%	1.94%	18.93%
Vojvodina Region	<b>55.58%</b>	<b>10.45%</b>	29.97%	32.77%	<b>11.97%</b>	<b>56.78%</b>
Sumadija and West Serbia Region	74.20%	39.26%	24.16%	50.24%	1.33%	10.51%
South and East Serbia Region	76.78%	39.32%	20.94%	44.91%	1.64%	15.77%
Kosovo Region						

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

**AHLEEs** represent, by number, a small group (only 1,647 households or 0.29% of the total number of AHs), but have a significantly higher share in UAA (16.10%)

**AHLEEs with smaller property** comprise 28.71% of the total number of holdings in this group, and their share in UAA is only 0.15% (excluding land 6.67%). These holdings dominate in the number of AHLEEs, and are minor in the total UAA of AHLEEs holdings in three regions; **AHLEEs with a medium size of holdings** comprise 18.21%, and their share in the UAA is only 0.58%. **AHLEEs with larger holdings** comprise 47%, and their share in the UAA is even 99%. However, in the category of holdings larger than 100 ha it is 29.57% of the total number of AHLEEs and they utilize 96.76% of the land of this group of holdings. **Large holdings** dominate in the total of UAA and are differently represented in the total number of AHLEEs in regions.

**Table 10.** Regional analysis of the ownership structure of AHLEEs in Serbia, 2018

Region	Small holdings up to 5 ha		Medium holdings 5 – 20 ha		Large holdings over 20 ha	
	Share in the number of AHLEEs	Share in UAA	Share in the number of AHLEEs	Share in UAA	Share in the number of AHLEEs	Share in UAA
Belgrade Region	32.53%	0.21%	21.69%	0.74%	38.55%	99.05%
Vojvodina Region	17.10%	0.07%	17.33%	0.42%	60.48%	99.50%
Sumadija and West Serbia Region	48.23%	0.70%	20.69%	1.70%	22.05%	97.60%
South and East Serbia Region	31.82%	0.20%	16.22%	0.63%	44.00%	99.17%
Kosovo Region						

Source: author's calculation based on data of the Statistical Office of the Republic of Serbia

The analysis of the ownership structure of all AHs according to the legal status of holdings in Serbia indicates that:

**FAHs** is dominant in the total number of holdings (99.71%) and, at a slightly lower level, in the total UAA (83.84%). In the group of *holdings with smaller property*, FAHs occupy 70.95% of the total number of FAHs, and their share in UAA is only 27.67%. This result suggests a large fragmentation of FAHs properties. In the group of *holdings with medium size of property*, there are 24.31% of the total number of FAHs, and their share in the UAA of FAHs is 41.77%. In the group of *holdings with larger property*, only 3.84% are FAHs, and their share in the UAA of this group of holdings is 30.57%. So the number of large FAHs is small, but they utilize one third of the FAHs land;

**AHLEEs** by number represent a small group of holdings (only 1,647 households or 0.29% of the total number of AHs), but have a significantly higher share in the total UAA (16.10%) and are the dominant category by number of holdings and UAA in two groups of holdings with larger properties (over 20 ha and over 100 ha). In the group of *holdings with smaller properties*, AHLEEs comprise 0.12% of the total number of holdings in this group, and their share in UAA is only 0.11%. In the group of holdings with medium-sized property, AHLEEs comprise 0.22%, and their share in UAA in this group is only 0.26%. In the group of *holdings with larger property*, AHLEEs comprise 3.58%, and their share in UAA is as high as 38.41%. However, in the category of properties larger than 100 ha there is 29.57% of the total number of AHLEEs and they utilize 96.76% of the land of this group of holdings.

AHLEEs are relatively small (1,647), but have a significant average size of property, an average of 364 ha of utilized property and even 479 ha of NUAA; 779 ha of woodland. AHLEEs have at their disposal even 186,138 ha or 64.20% of the total NUAA in Serbia, which indicates the need for a detailed analysis of agricultural land management in this group of entities.

## Conclusions

The aim of this paper represents a realistic view of economic strength and type of agricultural production on holdings in Serbia, in order to obtain a quality, analytical and comparable basis for analysis of structural characteristics and economic parameters of AHs and conceptualization of agricultural policy measures, but also for comparative analysis with AHs in EU countries and neighboring countries [Simonović, 2004], as well as a base for scientists in further scientific research on the structural characteristics and economic performance of agricultural holdings in Serbia. Systematization of data and analysis of the obtained results led to a number of important conclusions about this segment of agriculture in the Republic of Serbia. Some of the basic conclusions can be singled out in a brief review of the overall results obtained.

According to the obtained results in the Republic of Serbia in 2018, there are 564,542 agricultural holdings, 562,895 family agricultural holdings, 1,375 agricultural holdings of legal entities and 272 agricultural holdings of entrepreneurs. It can be concluded that

the total number of holdings is dominated by family holdings (99.71%). The largest part of the total number of FAHs is in the region of Šumadija and Western Serbia (about 43%), and the smallest is in the region of Vojvodina (5.32%). *AHLEEs* are minor in number (only 0.29%), but this group has a significant share in the UAA and a large average area of property, so it can be concluded that they are important production and economic entities in Serbian agriculture.

It can be concluded that Serbian agriculture is characterized by a dominant number of FAHs in relation to the *AHLEEs*. The average size of property is small (6.22 *ha/AH*; 5.23 *ha/FAH* and 364.2 *ha/AHLEE* - Table 6). The FAHs category is dominated by FAHs with a property of less than 5 ha, and in the *AHLEEs* category the most represented are entities with a property of more than 20 ha. This ownership group uses the largest part of the land in all observed regions. There is an obvious contrast between the smallest and the largest ownership group of holdings and their representation in the total number of agricultural holdings AHs and in the total area UAA.

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### Conflict of Interest

The authors declare that they have no conflict of interest.

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