STUDY REGARDING THE DYNAMICS OF MAIN QUANTITATIVE AND QUALITATIVE INDICATORS FOR THE AGRICULTURAL SECTOR IN IAȘI COUNTY

Ștefan VIZITEU[1], Stejărel BREZULEANU[1], Alexandru Dragoș ROBU[1], Eduard BOGHIȚĂ[1]

e-mail: stefan.viziteu@yahoo.com

Abstract

Knowing and updating the values of the main quantitative and qualitative indicators of the agricultural sector related to a certain area of interest allows for an overall vision and the generation of viable solutions by correlating the values resulted with the needs of the specific area (generating an increase in productive, assuring the consumption needs, environment protection, encouraging investment) as well as expressing current trends in a particular field.
Changes regarding crop area, production on main crops and average yields, livestock by category, farm tractor and agricultural main agricultural machinery or the value of total agricultural output expressed graphically or tabularly reveal the neuralgic points (which require attention from the responsible factors) or the strengths indicating areas with development potential and favorable to investment.
The management of the economic entities in the agricultural sector aims to make the specific activity more efficient and a significant precursor stage in this process is represented by the analysis of the specific indicators of the field in which the enterprise activates in order to find the best way to respond to the dynamics of the characteristic influence factors. The paper investigates the main quantitative and qualitative indicators of the agricultural sector in Iași County over the course of seven years, highlighting the current situation and the fluctuations registered with the impact on the entire economy of the analyzed area.

Key words: agricultural sector, quantitative indicators, production value, agricultural management, economic efficiency

Agriculture, a basic component of the economy, thanks to its functions in the production process, contributes to the achievement of the macroeconomic optimum, as well as to the optimization of the economic activity for the other branches. As a result, establishing an optimal ratio between plant production, animal production and other sectors of activity is an essential and indispensable requirement to maximize social effort (Brezuleanu S., 2009).

The agricultural policy, in line with Romania's general economic development strategy, must ensure the conditions for agriculture to become a competitive sector, able to integrate into the common organization of the agro-food markets in the European Union, in their dynamics, through the development of the market mechanisms, the formation and modeling of the agrarian structure, rural development and environmental protection. (Manole V. *et al*, 2001).

Agricultural development through investments in capital (capital is the main engine of economic growth) increase the demand of agriculture for industrial goods and by effect, the industry develops faster. Thus, agricultural growth deserves priority positions since the growth in this sector help industry to grow further (Ștefan G., Coca Oana, 2015).

Knowing the land use and especially agricultural land use provide the necessary data to assess the type of farming that is being practiced, to find ways to transform into intensive use categories, to increase farmland, etc. (Brezuleanu S., Viziteu Șt., Robu A. D., 2017). The economic indicators for estimating the use of the land fund are as follows:

- the size of the land fund;
- the structure of land fund, agricultural land and arable land;
- the degree of land use;
- intensity degree of land use.

Iasi County is ranking on the country classification among the medium sized counties, ranking on 24, with a higher proportion of the private land sector. In territorial profile, the land fund is reflected in different services structures with characteristics from an area of agricultural productions to another (Ungureanu G. *et al*, 2016).

[1] "Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine, Iaşi

MATERIAL AND METHOD

The paper used and processed statistical data provided by the Chamber of Commerce and Industry of Iasi, the National Institute of Statistics and the Statistics Department of Iasi County. The methods used in order to achieve the required results were: statistical data analysis and data interpretation as well as their graphic representation, comparative analysis and analysis of indicators dynamics taking into consideration generally a seven years period that indicator were recorded.

RESULTS AND DISCUSSIONS

The study results referred to such indicators as land structure, intensity degree of land use, the evolution of the tractor farm, agricultural production value etc.

The structure of the land fund expresses the percentage of the different categories of land use depending on the area of the land fund or the agricultural land. Both the structure of the land fund and the structure of the agricultural land can be determined over time, highlighting the changes that the different categories of land use have in each year and from one year to the next.

If after the land improvement works the structure of the land fund changes, it is necessary to calculate the modification index of this structure. The land fund structure by land use categories can guide us on the profile of the analyzed area. It is determined using the formula:

$$X_s = \frac{S_i}{S_t} * 100$$

in which:

X_s = index of structure - %;

S_i = land area in the category of lhr and use – „i" – ha;

S_t = the total area to which land category „i" is related – ha.

The structure of the Iaşi County land fund after land use category for 2014 indicates that agricultural land area is 70% from county total land fund and that arable land occupies 67,17% within agricultural land area (*figure 1)*.

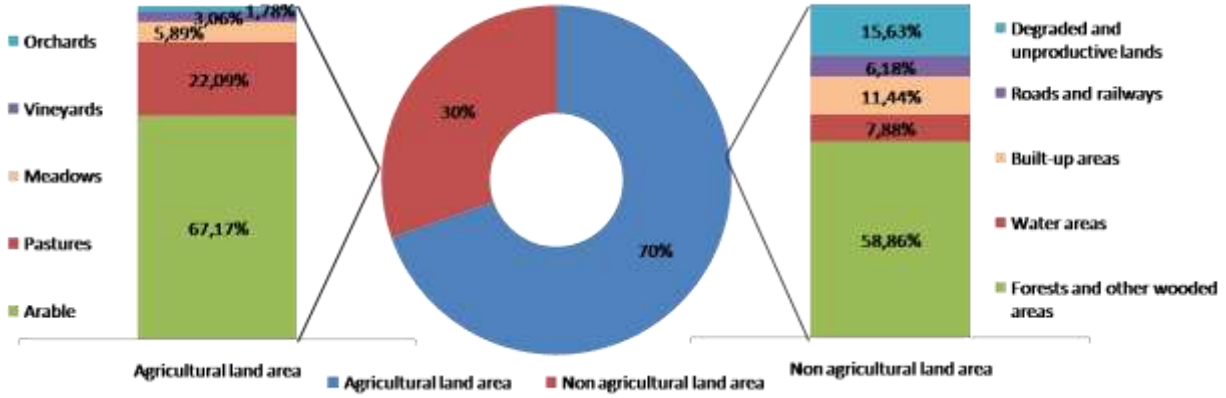

Figure 1 **The structure of the Iaşi County land fund and land use categories (2014) - ha**

The intensity degree is important to agricultural land and especially to arable land (Sîmbotin L. *et al*, 1997). It is determined through the index of intensive use of agricultural land which is calculated on the basis of the ratio between the surface of the agricultural land (expressed in conventional arable land) and its real (physical) area using the formula:

$$V_{ui} = \frac{S_i * k_i}{S_{agr}}$$

in which:

V_{ui} = index of intensive use for the agricultural land;

S_i = area of land use category „i" of the agricultural land;

k_i = the conversion factor in conventional arable for the land use category „i".

For Iași county intensity degree of land use is calculated in *table 1*.

Table 1

Intensity degree of land use for the agricultural area in Iaşi county - 2014

Land use category	Physical area (ha)	Conversion factor	Area in conventional arable (ha a.c.)	Intensity degree of land use (V_{ui})
Arable	256098	1	256098	0.67
Pastures	84231	0.2	16846.2	0.04
Meadows	22465	0.5	11232.5	0.03
Vineyards	11679	8	93432	0.25
Orchards	6783	5	33915	0.09
Total	381256	-	411523,7	**1.08**

The result obtained shows a value higher but close to the reference value (1). Area expressed in conventional arable (ha a.c.) is 411523.7 ha in comparison to physical area of 381256 ha.

The indicator shows that within Iași county land use categories are almost equally intensive (upper) – more valuable and extensive (lower) – less valuable in relation to the arable.

A representative indicator for the agricultural sector is the number of farm tractors and main agricultural machinery that shows the size of the activity conducted in this field (*table 2*).

Table 2

The evolution of the farm tractors and main agricultural machinery in agriculture at the end of the year (2010-2016) - number

Categories of tractors and agricultural machines	Year							% 2016/ 2010
	2010	2011	2012	2013	2014	2015	2016	
Farm agricultural tractors	3217	3272	3332	4035	4168	3957	3984	+23.84
Plows for tractor	2612	2755	2545	3148	3168	3340	3351	+28.29
Mechanical seeders	1275	1611	1603	1683	1683	1880	1898	+48.86
Self-propelled cereal harvesters	358	391	387	422	439	492	495	+38.27

Source: own calculation using data from National Institute of Statistics

Related to the first year of analysis in Iași county the number of farm agricultural tractors in 2016 increased by approximately 23%. This trend characterizes also the evolution of other machinery and equipment (plows for tractor – 28%, mechanical seeders – 49%, self-propelled cereal harvesters- 38%). This has led to the development of agricultural activity specific for the area.

The evolution of main crops cultivated within Iași county provides an overview of plant cultivation orientation and indicates the changes in area structure (*table 3*).

Table 3

Area cultivated with main crops in Iași county (2010-2016) - ha

Main crops	Year							% 2016/ 2010
	2010	2011	2012	2013	2014	2015	2016	
Wheat	42574	29162	31746	32053	38531	37787	38566	-9.41
Oat	5056	4980	5240	4804	4700	4656	4696	-7.12
Maize	97434	103415	100771	93946	98445	96869	100483	+3.13
Pea	335	262	345	242	294	242	414	+23.58
Sunflower	24484	27812	27234	27055	26259	26633	25755	+5.19
Rapeseed	7882	9146	1865	4899	10282	6064	5920	-24.89
Sugar beet	2115	1702	2709	2588	3476	3751	3701	+74.99
Potatoes	8759	9430	8852	8934	8501	8393	8705	-0.62
Tomatoes	2030	2269	1988	1921	1702	1697	1577	-22.32
White cabbage	1487	1624	1641	1944	1768	1764	1606	+8.00
Vegetables in solariums and greenhouses	283	425	135	77	74	76	73	-74.20
Alfalfa	17155	17018	16490	21797	22534	22765	22819	+33.02
Bearing orchards	4746	4328	4808	4994	4940	4611	4436	-6.53

Source: own calculation using data from Statistics Department of Iasi County

Wheat area recorded fluctuations during the period under review but relate to the first year of analysis it decreased by 9.41%. A significant increase was recorded by the sugar beet crop (74.99%). A higher percentage is owned also by the areas of vegetables in solariums and greenhouses crops which decreased 74.20% and alfalfa crop which increased by 33.02%.

Livestock by main categories of animals as quantitative indicator is presented in *table 4*).

Table 4

Livestock by categories of animals at the end of the year (2010-2016) - number

Categories of animals	Year							% 2016/ 2010
	2010	2011	2012	2013	2014	2015	2016	
Cattle	70815	69964	71230	73894	72157	74316	71602	+1.11
Swine	114135	117375	124826	126079	129324	123467	113784	-0.31
Sheep	225006	228275	230402	238091	250696	250734	252017	+12.00
Goats	29042	34720	34148	34245	34781	34988	35721	+23.00
Horses	33363	32764	30920	30700	31779	30346	30816	-7.63
Poultry	2962305	2810537	2738881	2739359	2845118	2818099	2773655	-6.37
Families of bees	37104	37009	37783	38195	38483	39997	40080	+8.02

Source: own calculation using data from Statistics Department of Iasi County

Within livestock the number of cattle as main category remained constant along the period taken into consideration. with small variations from one year to another (compared to 2010 in 2016 there were 1.1% more). A steady increase every year was revealed at goats (23%) but mainly the livestock shows no important changes.

Analysis of the value of the agricultural branch production in addition to the base quantitative indicators (area cultivated. crop production. number of farm tractors. livestock) describes the importance of this sector in the county economy and compares it with the other sectors involved in GDP formation (*table 5*).

Table 5

The value of the agricultural branch production by sectors (2010-2015) -thousand lei

Branch of agriculture	Development regions and county	Year						% 2016/ 2010
		2010	2011	2012	2013	2014	2015	
Total		64452571	76508656	64259474	78464416	74524454	68749578	+6.67
	North-East Region	10804888	12639425	10646133	13059566	12670938	11318072	+4.75
	Iași	2024170	2362921	1804801	2375300	2292929	2050118	+1.28
Cultivation of plants	TOTAL	43488480	54179772	40169144	53843812	49058330	43574128	+0.20
	North-East Region	6934858	8585793	6169594	8674619	8009301	6517779	-6.01
	Iași	1442688	1744452	1157611	1807396	1677672	1453326	+0.74
Animal husbandry	TOTAL	20406840	21784104	23555260	23876547	24481641	24315779	+19.16
	North-East Region	3821656	4006369	4412265	4330573	4575234	4720511	+23.52
	Iasi	553777	589372	613531	552407	596302	572593	+3.40
Agricultural services	TOTAL	557251	544780	535070	744057	984483	859671	+54.27
	North-East Region	48374	47263	64274	54374	86403	79782	+64.93
	Iasi	27705	29097	33659	15497	18955	24199	-12.65

Source: own calculation using data from National Institute of Statistics

The value of the entire agricultural sector for the Iași County in 2015 was approximately 2 billion lei from which 70.9% resulted from cultivation of plants. 27.9%. from animal husbandry and only 1.2% from agricultural services (value that decreased 12.65% from the 2010). The values remained relatively constant during the analysis period.

Another important indicator for this sector is population occupied in agriculture (*table 6*).

Table 6

Population occupied in agriculture. forestry and fishing (2010-2015) - thousand people

CAEN Rev. 2 (activities of the national economy)	Development regions and counties	Year						% 2015/ 2010
		2010	2011	2012	2013	2014	2015	
TOTAL	TOTAL	8371.3	8365.5	8569.6	8530.6	8431.7	8340.6	-0.37
	N-E Region	1207.2	1192.8	1224.7	1203.7	1180.2	1149.4	-4.79
	Iași	285.7	280	287.1	285.8	280.3	277.4	-2.91
Agriculture. forestry and fishing	TOTAL	2439.9	2442	2510	2380.1	2304.1	2003.1	-17.90
	N-E Region	501	495.5	508.4	482.2	465.7	403.8	-19.40
	Iași	96.1	93.8	96	91.4	87.5	76.2	-20.71

Source: own calculation using data from National Institute of Statistics

In agriculture, forestry and fishing domain the number of population occupied decreased. as the analysis shows but in a ratio much higher than in other sectors of the economy. At the level of 2015 there were 20.71% less people than 2010. This situation characterizes also the evolution at regional and national level. Regarding the turnover for agriculture, forestry and fishing in Iași county the sector with the highest share is cultivation of plants with 56% (*figure 2*).

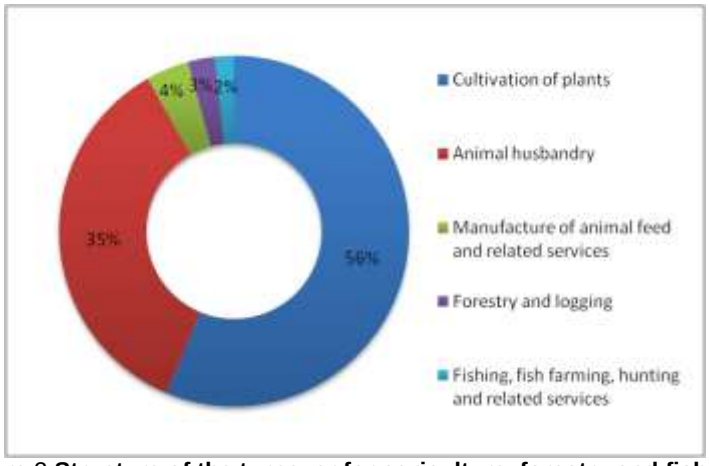

Figure 2 **Structure of the turnover for agriculture. forestry and fishing. with subcategories for Iași county in 2016 (%)**

Within this wide sector animal husbandry owns a turnover which represent 35% whereas manufacture of animal feed and related services is 4% from total turnover. Cultivation of plant remains the most important activity with influence on the agricultural sector and local economy in general.

The evolution of total turnover for agriculture. forestry and fishing (*figure 3*) indicates an increase starting 2010.

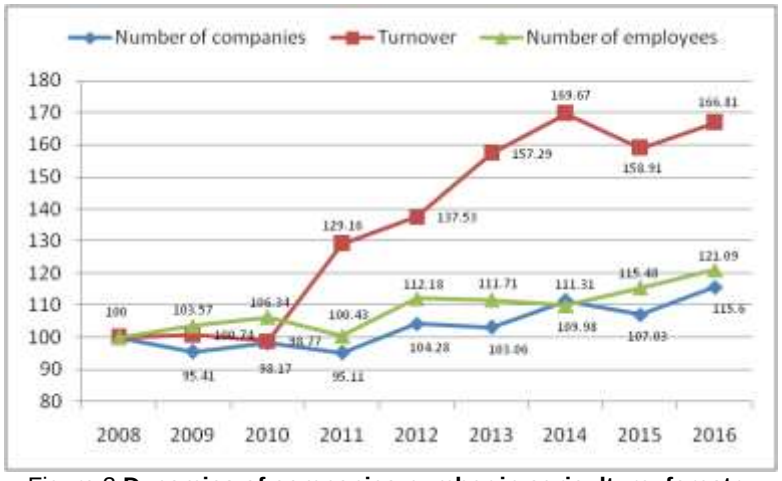

Figure 3 **Dynamics of companies number in agriculture. forestry and fishing - Indices of evolution (2008=100)**

According to the upper chart in 2016 there were 15.6% more companies than in 2008. 21.09% more employees and the turnover increased by 66.81%. As seen in the graphical representation the agricultural sector records an increase in value and in the contribution to the county economy and welfare which is also reflected in the top of the county companies set by Chamber of Commerce and Industry (*table 7*).

Table 7

Main agri-food companies in top 20 companies for 2016 in the Iași county

Company	Location	Place in Top Companies by Turnover for Iași county	Turnover	
			(milion lei)	(milion euro)
Industrializarea cărnii Kosarom S.A.	Pașcani	9	166.4	37.8
Cotnari S.A.	Cotnari	12	139.1	31.6
Fermador S.R.L	Iași. Podu-Iloaiei	18	121.8	27.7

In 2016 at the level of Iaşi County there were 60.821 economic agents with a total turnover of 21.7 billion lei (4.9 billion euros) and a profit of 1.8 billion lei. Among all the companies in the agricultural and agri-food sector the company's best placed is Kosarom S.A (9th position) followed by Cotnari S.A. and Fermador S.R.L. In total Iaşi county the NCEA code 0111 - Cultivation of cereals (excluding rice) legumes and oleaginous plants owns 8 with 457.8 million lei (2.11% of the turnover per county). Main 5 companies are described in table 8.

Table 8

Top companies with NCEA 0111 - Cultivation of cereals (excluding rice). leguminous and oleaginous plants from Iasi county. 2016 - lei

	Company	Turnover (ron)	Total capital (ron)	Fixed assets total (ron)	Current assets total (ron)	Average number of employees
1	AGRICOLA 96 SA ȚIGĂNAȘI	44533221	16318778	10103520	19944323	83
2	AGRIMARVAS SRL	32906178	22176143	29471787	24007819	57
3	SEMCONSULT TOP SRL	31987659	12503836	24845573	14199964	48
4	VITAPLANT SRL	26899402	6881392	8344140	13269785	11
5	PANIFCOM SRL	24465729	16757904	19958199	16310172	70

From the total companies in this sector an important role have small companies. The most important small company in this field is SEMCONSULT TOP SRL. The hierarchy established by the Iasi Chamber of Commerce and Industry using its own calculation methodology took into account the following economic indicators: net turnover operating profit operating profit rate efficiency of human resources utilization. efficiency of employed capital.

Figure 4 **Small companies ratings within NCEA code 0111 - in Iași county** (*Data provided by Iasi Chamber of Commerce and Industry)*

CONCLUSIONS

The study revealed the main aspects of the agricultural sector from the Iași county: the structure of agricultural area (in which 67.1% is arable land) the intensity degree of land use (of 1.08). the evolution of main crops areas and the livestock but also specified the importance of agricultural sector in the business environment (analyzing the contribution of agriculture within local economy and highlighting the main features of the representative companies in the field).

The necessity of the study was also given by the number of people involved in this sector. and the fact that management strategies need to take these elements into consideration in order to ensure the optimal development of economic and social activities.

REFERENCES

Brezuleanu S.. Viziteu Şt. Robu A. D.. 2017 - *Management în agricultură: îndrumar pentru aplicaţiile practice şi ghid de proiect*. Editura Ion Ionescu de la Brad. Iaşi.

Brezuleanu S.. 2009 - *Management în agricultură*. Editura Tehnopress. Iași.

Sîmbotin L et al. 1997- *Ghidul managerului agricol*. Editura Agroprint. Timișoara.

Manole V et al. 2001. Managementul fermei. Editura Economică. București.

Ciurea I. V. Brezuleanu S. et al.. 2001 - *Management. Aplicații practice în fermele agricole vegetale*. Editura ”Ion Ionescu de la Brad”. Iași.

Ungureanu G. et al . 2016. *Studies regarding the development of agricultural production in the NE region of Romania*. Lucrări Ştiinţifice – vol. 59(1)/2016. seria Agronomie. pp. 255-260.

Ștefan G.. Coca Oana. 2015 - *The place of agriculture in economic growth*. Lucrări Ştiinţifice – vol. 58 (1)/2015. seria Agronomie. pp. 199-202.