CASE STUDY OF AN INTENSIVE AGRICULTURAL SYSTEM LOCATED IN GĂTAIA, TIMIȘ COUNTY, ROMÂNIA

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Abstract: *Agriculture is one of the main drivers, which pushes a society for change, showing influences in both the economic and social environment. Agriculture in turn is influenced by various factors that get out of human control, such as natural and technical factors. Some of the main natural factors are the shape of the land and the type of soil, and the technical factors are represented by mechanization, irrigation, chemicalization, etc. The increase in large-scale agricultural production has led to the emergence of intensive agriculture. A system that is based on the concentration and specialization of production. (Okros 2016) The different components of the technological system are intensively applied. There are issues that are in favour of this type of agriculture and others against it, because the use of chemicals to accelerate crop production pollutes the waters and soils.(Berbecea, 2014) Through this paper we want to present a case study on an intensive agricultural system located in Gătaia. The area of this locality offers an ideal environment for crop diversity due to the plain area in which it is located, with a temperate continental climate and soils of high fertility.(Borcean 2009) The data presented are collected from a farm for a period of 3 years, more precisely for the years 2018, 2019, 2020 with a total area of 4.160.21 ha. The main agricultural crops within the farm being wheat and corn and the rest of the crops are intended as a feed base for the livestock sector that the farm owns and to carry out a judicious crop rotation. (Duma-Copcea, 2014)*

Keywords: *soil, intensive agriculture, factors, multiannual data*

INTRODUCTION

Agriculture is a traditional branch of the Romanian economy, which has, as a means of production, the agricultural land fund (total land within the boundaries of the country, including those underwater), which provides the necessary food, raw materials for some industries and export products. It has been practiced in our country since prehistoric times, with shepherding, practiced under several forms including transhumance (moving flocks according to the high season to high altitude areas) as predominant. (OKROS 2016)

The economic and social importance of agriculture as a unique source to meet the elementary needs of the people – food and clothing – and without which one cannot speak of social peace and normal economic development, is recognized by all the countries of the world.

The considerable increase in the number of agricultural owners to over 5,000,000 of which the number of assets is 1,200,000-1,500,000 raises complex problems for efficient agricultural holdings to ensure decent revenue for family and capital accumulation opportunities for modernization. Considering that the average size of a property is below 2 ha at country level, it is necessary to establish the minimum size of farms that are economically and socially effective. In the current period of agriculture, most countries in Central and Eastern Europe are facing the new experience of the transition to the market economy. (DUMA, 2017)

A branch with old traditions of Romanian agriculture is the culture of cereals: wheat, maize, barley, and, to a lesser extent, sorghum, rice, and oats. The main cereal regions in

Romanian are the Romanian Plain, the Western Plain, the Moldavian Plateau, the Dobrogea Plateau, the Transylvanian Depression and the Getic Plateau. (NITA, 2018)

The main technical plants cultivated in Romania are sunflower (southeast of the country), soybean, sugar beet, flax and hemp. In colder areas (the Suceava Plateau, the Depression of the Oriental Carpathians, the north-west of the Transylvania Depression) and in the plains, potato is also cultivated. Vegetables and legumes for grains are grown especially in the surroundings of cities and in the meadows of rivers.

At present, Romania's agriculture is, in terms of agricultural structures, in a similar situation as the majority of European countries about 40 years ago. (DRAGOESCU, 2017)

Located in Timiș County, in the southwest, Gătaia has the following geographic coordinates: 450 22' northern latitude and 210 25' eastern longitude. (GAICA, 2016)

The average annual temperature (recorded at the Timisoara Meteorological Station) is 10.90C. On the territory of Gătaia, the average multiannual temperature is a little lower due to the influence of the Piedmont area. The average annual temperature of 10.90C, due to ocean air influences, has no major annual variations. The average amount of precipitation is 600-700 mm/year. (MIRCOV, 2016)

The area of this locality offers an ideal environment for crops due to the plains in which it is placed, with temperate continental climate and high fertility soils.

MATERIAL AND METHODS

The share of agriculture in the Romanian economy decreased steadily after 1990 (the rate of decline was slower in the first years of transition and faster after 1997). However, the contribution of agriculture to GDP growth remains substantial (12.8% in 2001) compared to the EU average (1.7%).

The regional distribution of agricultural lands according to the way of use is differentiated in relation to the relief conditions, with the pedo-climatic characteristics and the suitability for crops. Overall, only 25% of all agricultural lands have a superior quality, with a good and very good productive potential.

The agricultural production showed very different specific dynamics, both sectorial (vegetable and animal), as well as in regional profile, depending on the diversity of the conditions of agro-pedoclimatic suitability, but also on the degree of use of the production factors. The vegetal production registered a higher growth rate, because it supposes lower material and financial efforts, in the conditions of the nonexistence of the capital market and of the advantageous credits.

Over the last decade, livestock numbers have declined significantly, including queen herds. below the current level, which represents a technological minimum, can lead to the compromise of the genetic background in animal husbandry. Data obtained from MADR and INSSE and with the support of the Agricultural Chamber of the City Hall of Gătaia were used for the elaboration of this paper.

RESULTS AND DISCUSSIONS

In this work, we present a case study on an intensive agricultural system located in Gătaia. The agricultural system studied is intensive. The crops of the holding differ from year to year due to market requirements, crop rotation and climate change. The technological park is very well proportioned, changes that take place annually (the decrease of their number) are due to their replacement by other machines of the same but more performing type. At the same time, this system is complemented by a wide range of livestock to capitalize on vegetable

products. The zootechnical sector occupies an important place in the holding, the main livestock being the swine (over 77,000 heads) followed by sheep (16,000 heads) and cattle (9,000 heads), plus goats, poultry, and bees. (MICU, 2016)

Structure of crops

Table 1

Crops in the holding (2018)

Crop	Ha
Cereals	1909,58
Wheat	986,35
Triticale	21
Barley	18
Corn	869,23
Sorghum	15
Oily plants	111
Sunflower	58
Canola	38
Soybeans	15
Potatoes	1,35
Legumes	6,35
Green peas	2,85
Melons	3,50
Fodder plants	64
Clover hay	36
Plants for silage	28
Intensive orchards	5

As shown in Table 1, the main agricultural crops in the holding for 2018 were wheat on an area of 986 ha followed by maize with 870 ha. The rest of the crops were intended as a fodder base for the livestock sector of the holding and to perform a rotation of judicious crops.

Table 2

Crops in the holding (2019)

Crop	Ha
Cereals	1823,89
Wheat	1003,28
Triticale	35
Barley	9
Corn	753,61
Sorghum	23
Oily plants	148
Sunflower	75
Canola	50
Soybeans	23
Potatoes	0,62
Legumes	9,28
Green peas	5,28
Melons	4
Fodder plants	72
Alfalfa	44
Clover hay	15
Plants for silage	13
Intensive orchards	5

As can be seen in Table 2, the main crops of the holding in 2019 was wheat, cultivated on an area of 1,003 ha, followed by maize which decreased to 753 ha in 2019. The area cultivated with sunflower increased from 58 ha to 75 ha and the area cultivated with rape increased from 38 ha to 50 ha.

Table 3

Crops in the holding (2020)

Crop	**Ha**
Cereals	1908,67
Wheat	955,23
Triticale	28
Barley	12
Corn	895,44
Sorghum	18
Oily plants	76,45
Sunflower	58
Canola	45
Soybeans	18
Potatoes	1
Legumes	6
Green peas	3,20
Melons	2,80
Fodder plants	71,72
Alfalfa	50
Clover hay	12
Plants for silage	9
Intensive orchards	5

Technological Park: Machinery and Farm Buildings

Table 4

Technological Park: Machinery (2018)

Vehicules and tools	**Private property**	**Legal property**
Tractor 45 CP	5	2
Tractor 45 – 65 CP	20	3
Tractor 66 – 100 CP		15
Tractor 101 – 140 CP		30
Tractor 141 – 200CP		18
Tractor 201 – 280 CP		5
Tractor +280 CP		
Garden tillers	5	
Mower	5	
Plow (all types)	14	27
Cultivators	7	
Disc harrows (all types)	5	
Combinators		9

Simple seeder	5	
Multifunctional seeder		10
Simple Planter	3	8
Multifuntional Planter		2
Fertilizer spreaders	2	7
Manure spreaders	2	5
Weed control machines	6	10
Harvester	2	15
Corn harvester	3	8
Trailers	25	55
Pickup car	5	
Cart	10	
Front loaders	2	6

Table 5

Technological Park: Farm Buildings in m2 (2018)

Construction	**Private property**	**Legal property**
Stalls	1100	32000
Barn warehouses	780	8300
Hay storage	500	4250
Sheds	3500	1120

As can be seen from Tables 4 and 5, the technological park and the construction area serving abundantly the farm needs.

Table 6

Technological Park: Machinery (2019)

Vehicules and tools	**Private property**	**Legal property**
Tractor 45 CP	5	2
Tractor 45 – 65 CP	12	3
Tractor 66 – 100 CP		18
Tractor 101 – 140 CP		23
Tractor 141 – 200CP		9
Tractor 201 – 280 CP		4
Tractor +280 CP		
Garden tillers	5	
Mower	3	
Plow (all types)	14	20
Cultivators		7
Disc harrows (all types)	5	
Combinators		9
Simple seeder	5	

Multifunctional seeder		11
Simple Planter	3	8
Multifuntional Planter		2
Fertilizer spreaders	2	6
Manure spreaders	2	5
Weed control machines	5	12
Harvester	2	15
Corn harvester	3	8
Trailers	25	40
Pickup car	5	
Cart	10	
Front loaders	2	6

Table 7

Technological Park: Machinery (2020)

Vehicules and tools	**Private property**	**Legal property**
Tractor 45 CP	5	2
Tractor 45 – 65 CP	12	3
Tractor 66 – 100 CP		18
Tractor 101 – 140 CP		23
Tractor 141 – 200CP		7
Tractor 201 – 280 CP		2
Tractor +280 CP		
Garden tillers	5	
Mower	3	
Plow (all types)	14	20
Cultivators		7
Disc harrows (all types)	5	
Combinators		9
Simple seeder	5	
Multifunctional seeder		10
Simple Planter	3	8
Multifuntional Planter		4
Fertilizer spreaders	2	6
Manure spreaders	2	5
Weed control machines	5	10
Harvester	2	12
Corn harvester	3	22
Trailers	25	35

Pickup car	5	
Cart	10	
Front loaders	2	6

The Livestock Sector

The livestock sector in 2018 consists of 2753 cattles, 10370 sheep, 109 goats, 77142 pigs, 553 birds and 1965 bees.

The livestock sector in 2019 consists of 7890 cattles, 14174 sheep, 196 goats, 77162 pigs, 636 birds and 2234 bees.

The livestock sector in 2020 consists of 8719 cattles, 16492 sheep, 199 goats, 77223 pigs, 1383 birds and 2497 bees.

As can be seen from the tables and figures above, the technological park is very well sized, with changes from year to year mostly due to refurbishment. Also, the livestock sector has an important place on the farm, the main animals reared are pigs – over 77,000 heads, sheep – 16,000 heads, and cattle – 9000 heads.

CONCLUSIONS

- The studied system is of the intensive agriculture type.
- The main agricultural crops in 2019 were wheat cultivated on an area of 1,003 ha and maize cultivated on an area smaller than in 2018 (a decrease to 753 ha). The area cultivated with sunflower increased from 58 to 75 ha and the area cultivated with rape increased from 38 ha to 50 ha.
- Crops differed from year to year due to market requirements, crop rotation and climate change.
- The technological park is very sized and the changes that occurred annually were due to the replacement by other machines of the same type but more efficient.
- At the same time, this system is complemented by a wide range of animals to value crop.
- The livestock sector plays an important role in the holding: the main animals reared are pigs with more than 77,000 heads, followed by sheep (16,000 heads) and cattle (9,000 heads), plus goats, poultry, and bees.

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