

## STATE AND DEVELOPMENT OF AGRICULTURAL MODELS IN BULGARIA

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### *Abstract*

*Bulgaria is known with deep agricultural traditions. The importance of understanding the model of agricultural farms in the country is of a great importance for sustainable sector. The existing models are characterized with a great variety by all indicators connected with organizational forms, management, productive structures, utilized land, access to funds, environmental orientations etc. The reviewed models are based on external and internal functional environment. The main aim of the study is to reveal the changes in agriculture models of farming in Bulgaria. The set up tasks are: 1) literature review of the main agricultural models. In this part are summarized agricultural models with their characteristics; 2) evidence of Bulgaria of existence of main agricultural models and their role for the sector; 3) analysis of statistical data of distribution of different agricultural models; 4) main findings and conclusions.*

*Key words:* agriculture models, farms, structures, management

### INTRODUCTION

The agricultural holdings in the country are characterized by a great diversity in terms of organizational forms, management and structure of production. The state of production structures in agriculture determines the possibilities for effective development of the sector and the conditions for the implementation of the policy measures.

Agricultural researches show a strong connection between changes in industry and improved infrastructure, which leads to increased efficiency of farms and hence better access to raw materials, the possibility of selling products, etc.

Farm models can be conventionally summarized and divided into two large groups that have a different model of functioning, management, and development. Agricultural sector traditionally is dominated by small farms, where management decisions are combined with the aims of household and farm development. The development of these farms largely dependent on the owner's

personal qualities, abilities, knowledge and skills [20] [30].

### ***Model of large agricultural holdings***

The main features of large farms are the number of objectives that must be in conformity with the capabilities of the business structure as well as focus mainly on profitable activities [19]. The decision-maker is the owner or hired manager, and his motivation depends on the person's professional qualities. The main criteria for choosing specialization is maximizing profits, maximizing resource using, investing in the best possible combination with long-term goals [17].

The literature review shows that the large farms also come under the name "agribusiness structure," meaning "large, technologically complex companies" [19] with a market-oriented production mainly from grain crops. Examples of existing of such a structure are found in countries with good conditions for agricultural activities and a liberalized policy such as Brazil and Argentina. The model of functioning of this type of farming is known as the Northern Model of Agriculture and is presented in Figure 1.

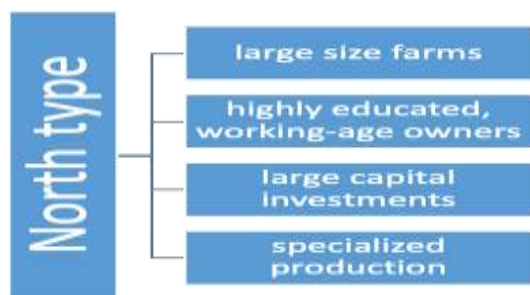


Fig. 1. North type of agriculture  
 Source: own adaptation.

**Model of functioning of a small farm**

Since 1970, there have been authors who have tried to find out the reasons for the emergence and existence of small farms, and they conclude that they must first understand the reasons for their existence and development and, through proper policies, which can lead to restructuring the agrarian sector [9]. All this determines the existence of different models of agriculture. In Bulgaria, the reasons for the existence of farms classified as small are complex. It is very difficult to separate the influence of all the factors that affect this type of farms. According to the literature, often aggregated factors are divided into the following groups: macroeconomic factors; demographic factors; agricultural policy; market-related factors, etc. [7]. Small farms are also known in the literature as the southern type of farming, which are characterized by a low level of mechanization, cheap labor and expensive land. The model is presented in Figure 2.



Fig. 2. South type of agriculture  
 Source: own adaptation.

**Models of agricultural holdings according to level of sales, distribution of the**

**outcomes (subsistence, semi-subsistence and stock agricultural holdings)**

Specific model can be proposed by the level of sales. The agricultural holdings can be compared according to the volume of sales made. The division is in monetary terms and is classified as a percentage of sold production. As a weakness, it can be noted that the current dynamics in terms of prices of demanded and supplied agricultural commodities in different markets can materially distort the real state of the surveyed farm. In a time, perspective, knowing the specifics of agriculture and its influence from climatic factors, the same farm with the same specialization and productivity [13] can realize a drastically different volume, quality and price production, respectively, to be included in a different group [11]. These factors of different outcome because of the size of the farm are observed mainly of livestock breeding [12] [22].

Over the years, many authors [7] [8] [16] [19] also use divisions of farms according to their degree of stock for sale. Under this statement, farms are divided into natural, semi-subsistent and subsistent farms. The subsistent farming model has been studied by a number of authors and in the field of the economy, often referred to as "agriculture in which plant production, livestock farming and other activities are mainly carried out for by the household consumption characterized by low productivity, risk and insecurity" [31].

Semi-subsistent farm as a terminology in the literature is often described as semi-stock farm and is well known structure in CEE. [14] [17].

From an economic point of view, the creation of semi-subsistence farms is mainly due to the lower income per person in rural areas compared to urban ones. Also, higher unemployment in the villages forces households to focus on agricultural activity. The slower development of rural markets is the reason for the slower commercialization of farms [14] [27].

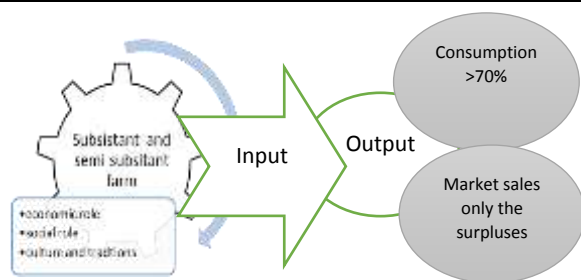


Fig.3. Model of subsistent and semi-subsistent farms  
 Source: own findings.

From Scheme 1 it can be concluded that natural and semi-subsistence farms are users of inputs, but they only participate in the production market in the presence of surplus after satisfying the household. Researchers working in the field of small farms burden the farm sales via barter, thus households receive a variety of products that they would not buy under market conditions due to lack of monetary income [18].

#### ***Agricultural model by legal status***

Agricultural holdings can be distributed by legal status and form models. They are formed on the basis of public needs for different agricultural products influenced by the natural, economic, technological and other conditions of a particular region or farm [16].

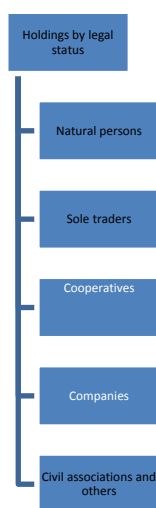


Fig. 4. Agricultural model by legal status  
 Source: own adaptation.

The level of differentiation of the organizational form is described as the interaction between the owner of the organizational form and the resources in a private and collective economy. Production

structures in agriculture, according to their status, are divided into: agricultural holdings of individuals; sole traders and cooperatives. Cooperatives are emerging alongside the intensive development of commodity-money relations as early as the era of initial capital accumulation. They are characterized by the following statements:

- the cooperative is a voluntary form of human associations;
- type of organizational form of public production;
- a business organization.

Typical for Bulgaria is part of the land to be organized in a cooperative. In this way, small landowners can benefit from better input prices for inputs such as preparations, seeds and fertilizers. Also farmers can have access to mechanized services at every stage of the activity. Last but not least, the cooperative also provides employment to a part of the landowner members.

#### ***Model of family agricultural holding***

Models of family agricultural holdings are a useful tool for exploring how household-specific transaction costs are formed, as well study the impact of foreign policy and market changes in rural areas [29]. Models of family agricultural holdings reveal the relationship between household and farm, focusing on their consumer and productive activity.

The family agricultural holding is considered as the primary and primary form of organization in agriculture. According to some authors [3], the risk arising from the production and realization of the production is taken over entirely by the farm owner and his family. Other authors [25] define the family farm as a specific organizational form that brings family, household and enterprise into one community.

According to Chayanov [6], the purpose of the family farm is to provide the means for family existence in the fullest use of the factors of production and labor. The main approaches to studying family farms are organizational, managerial and social [8]. According to the first, the family farm is a production unit in which the family is the main source of labor on the holding. The

management approach considers the farm as an individual economic unit, and the social as a working couple and their children living together in one household.

***Models of agricultural holdings according to the amount of input labor and the income earned from agricultural activities***

Models of agricultural holdings with part-time employment and hired labor are subject of research by a number of authors from the 1960s up to now. [4] [10] [23] [26]. According to some of the listed authors, farms are divided by income as follows: below 30% - a complementary source of income; 30-50% partial supplementary source of income; over 50% of basic income. The holdings, according to the criteria, can be combined in terms of employment. According to the employment, farms are divided into farms that provide full time employment and those that provide part-time employment. It explains the existence of small farms with part-time employment in the agrarian sector, as the ability of the household to optimally combine the free time of the members of the household with supplementary income [28].

***Diversified model***

This model adopts production principles based on "nature's work" as ecosystem services without prohibiting the use of synthetic or biological raw materials [21]. As with other farming systems, farmers in the diversified model apply adaptive management to reduce uncertainty. The model involves creating new organizational forms that interact with each other through knowledge sharing to reduce the risk of agrarian activities. Managements of these farms have developed good practices for different types of activities.

The main characteristics that distinguish this model from the rest are:

- (a) nature is seen as a major factor in the production and living space of people;
- b) introducing new social forms aimed at restructuring production in order to increase productivity.

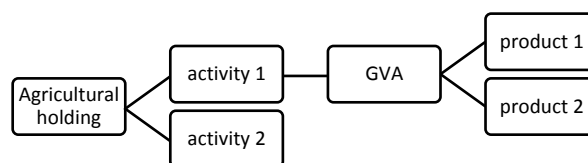


Fig. 5. Diversified model of agriculture  
Source: own adaptation.

***Model of organic farming***

The integrated assessment of agricultural and environmental policies requires different levels of analysis and includes scientific method used in different disciplines [1] [2] [15]. Therefore, bio-economic models of agricultural holdings for integrated assessment, should meet a number of important requirements. In existing models, the farm is a key element [24]. The organic farming model is directed to combining best environmental practices, maintaining a high level of biodiversity. The organic farming model is a comprehensive production management system that promotes and strengthens agro-ecosystem sustainability, including biodiversity, biological cycles and soil biological activity.

According to some authors [5] the organic farming model explores an agricultural management and food production system that combines best environmental practices, maintains a high level of biodiversity, preserves natural resources, applies high standards of welfare to animals and production methods to the preferences of some consumers towards products made using natural substances and processes.

**MATERIALS AND METHODS**

The main aim of the study is to reveal the changes in agriculture models of farming in Bulgaria.

In the first part is made a literature review of the main agricultural models. In this part are summarized agricultural models with their characteristics. On a theoretical level by system approach is made summarization of the literature findings and adjustments of the

model. Some of the models are presented in figures.

In the second part is shown an evidence of existence of main agricultural models and their role for the sector. In this part according to statistical data and own calculations Bulgarian's farms are classified to specific models and is made an analysis. In the last part of the publication are made some conclusions for the state and development of different type of farm models in Bulgaria.

The results are part of scientific project DN 15/8 Sustainable multifunctional rural areas: Reconsidering agricultural models and systems with increased demands and limited resources funded by the Bulgarian research fund.

## RESULTS AND DISCUSSIONS

Agrarian activities are traditional for Bulgaria. The growth rate of the output of the agricultural sector is 5% for the survey period and entrepreneurial income for the same period – by 2%. The data are presented in Table 1.

Table 1. Main economic indicators for the Agriculture sector, 2010-2016, million BGN

	2010	2013	2016
Output form Agriculture sector	7,474.8	8,593.3	7,830
Gross value added at basic prices	2,651.3	3,313.8	3,475
Intermediate consumption	48,253.5	5,279.5	4,356
Entrepreneurial income	2,241.3	3,058.8	2,285

Source: MAFF, Agrostistics Department, DG ARP, FSS.

The main indicators for the development of the agrarian sector, presented in Table 2, indicate that the number of farms is decreasing, but the arable land is increasing. In addition, the output of the agricultural activities has increased by 54% and the labor input is decreasing. According to this information, it can be argued that in Bulgaria the role of large farm as well as the productivity of one farm is strengthened.

Table 2. General indicators of the agrarian sector in Bulgaria

General indicators	2010/2016
Agricultural holdings (number)	-46%
Agricultural holdings and units providing common land for grazing animals* (number)	-46%
Utilized Agricultural Area of the agricultural holdings (ha)	5%
Total Utilized Agricultural Area (common land incl.)* (ha)	0%
Total standard output of agricultural holdings (thousand euros)**	54%
Livestock units	-7%
Labour input - AWU	-38%

Source: MAFF, Agrostistics Department, DG ARP, FSS.

In terms of the economic size of the agricultural holdings in Bulgaria, according to the information presented in Table 3, it is observed that the number of small farms are decreasing, the most significant is decrease in the group up to 2,000 Euros, which is nearly 60% reduction.

Table 3. Economic size of the holdings, 2010-2016

Limits in EUR	2010	2013	2016	% 2010/2016
	370,222	254,142	201,014	-46%
< 2 000	255,105	140,228	104,898	-59%
>= 2 000 < 4 000	59,473	51,384	34,956	-41%
>= 4 000 < 8 000	26,286	27,547	22,955	-13%
>= 8 000 < 15 000	12,509	13,849	13,746	10%
>= 15 000 < 25 000	6,043	7,056	8,248	36%
>= 25 000 < 50 000	4,733	6,020	6,675	41%
>= 50 000 < 100 000	2,535	3,229	3,967	56%
>= 100 000 < 250 000	1,908	2,383	2,676	40%
>= 250 000	1,630	2,446	2,893	77%

Source: MAFF, Agrostistics Department, DG ARP, FSS.

There is also a tendency to increase the number if the large farms by over 40% in the

all groups, and in the largest group the increase reaches 77%.

According to the development of agricultural models depending on the purpose of the production, over the past 20 years the tendency is in increasing the share of the production which is for sale. The data is presented in Figure 6.

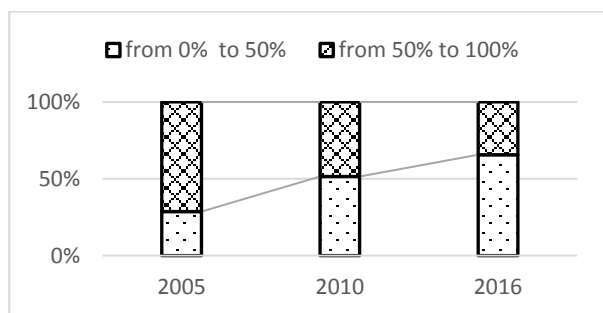


Fig. 6. Distribution of Bulgarian farms according to the % of sale and own consumption.

Source: MAFF, Agrostistics Department, DG ARP, FSS.

Bulgarian agriculture is restructuring and this reflects on the legal status of the units. During the last 16 years is observed decreasing trend of farms registered as a natural person (-50%) and solo traders (-11%) and cooperatives (-18%). The highest increment is observed in the category of companies, where the increase is with 74%. The data shows that the companies are very rapidly developing and the model of big farms is dominant. The data is shown in table 4.

Table 4. Holdings by legal status

	2010	2013	2016
Natural persons	350,041	237,317	175,209
Sole traders	2,134	1,871	1,892
Co-operatives	941	811	767
Companies	3,639	4,323	6,322
Civil associations and others	319	272	258

Source: MAFF, Agrostistics Department, DG ARP, FSS.

In Table 5 is presented the dynamic of the distribution of persons by type of labour. From the information can be concluded that the family labour is very important. The trend is decreasing by 45%, but still the number of

people is the highest- 375 250 persons (farming labour). In the other hand the number of persons employed in agriculture in category of non-family labour is increasing with 12% compared to 2010.

Table 5. Persons working on the holding by family relationship with the holder

Labour /Year	2010	2013	2016	% 2010/2016
Labour force	738,634	557,408	439,736	-40.5
Non-family	57,168	57,723	64,485	12.8
Family	681,466	499,685	375,250	-45

Source: MAFF, Agrostistics Department, DG ARP, FSS.

Table 6. Holdings by the other gainful activities carried out in the holding

Type of activity	2010	2013	2016
Provision of health, social or educational services			27
Agricultural mechanized services (ploughing, sowing, digging, harvesting etc.)	2,645	1,918	1,037
Non-agricultural mechanized services (snow-cleaning etc.)	255	283	285
Rural tourism (hotel and restaurant services)	145	106	138
Craftsmanship (pottery, weaving, cutlery etc.)	45	11	3
Processing of farm products (processing of agricultural products produced on the farm, processing of grapes for wine excl.)	307	376	312
Forestry	46	45	79
Wood processing	72	8	53
Production of renewable energy for the market (from wind, hydropower, biogas, etc.)	12	33	11
Production of fish and aquacrops, please specify	5	98	11
Other gainful activities, please specify	108	268	137
Total	3,640	3,146	2,093

Source: MAFF, Agrostistics Department, DG ARP, FSS.

Other important indicator is the efficiency of one employed person. Small farms up to 2 ha are having a 50% less efficiency per

employed person according to the big farms (own calculation by statistical data).

From the point of view of diversification of farms, it can be summarized that the total number of diversifying farms is unstable and in the most of the supplemented activities it is declining. The data is shown in Table 6.

The model of organic farms in Bulgaria for the period 2011-2017 show a tendency to increase certified organic production areas. In the 2017 the area of the organic production control system is 136,629 hectares, while in 2011 there were 26,622 hectares. The largest share are permanent meadows and pastures, perennial crops and technical crops. In 2017 the areas under control system occupy 2.72 % of the total utilized agricultural area in the country. For the same year the areas in transition are 87,122 ha.

## CONCLUSIONS

Models of agricultural farms in Bulgaria are diverse by their different classification characteristics. The main conclusions are:

The total number of agricultural holdings in Bulgaria decreased from 370 thousand to 201 thousand.

Despite the decrease in the total number, the most numerous group is small farm with the predominant models of natural and semi-subsistence farms.

From economical point of view, the number of small farms in Bulgaria is decreasing, the most significant is that in the group with standard output up to 2,000 euros, which accounts nearly 60% reduction.

There is a tendency to increase the number of large farms, as in the largest group the increase reaches 77 %.

The total utilized agricultural area increases by 5% over the survey period, the amount of input labour is decreasing and output from production has increasing trend. This means that the efficiency of agricultural holdings is increasing.

The farms up to 2 ha are less efficient according to the big farms, which are reaching efficiency up to 92% by one person.

At this stage the diversification processes are not yet developed and is missing data for distribution between the type of farms.

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