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Theme

The aim of the forthcoming sixth International Scientific Forum "Agrarian Economics in Aid to Agriculture" - Conference "European Agriculture and the New CAP Period 2021-2017: Predictions and Results", held from 23 to 25 October 2019 in Sofia, is an exchange of ideas, sharing of scientific knowledge and experience between agrarian economies on various topics, connect with the new agricultural policy, food audits and demand for agricultural, agricultural markets, as well as the bioeconomy and sustainable development. The forum will have the opportunity for distinguished foreign and Bulgarian researchers with longer creative experience to make sure you have to learn from the younger generation and discuss ideas and trends to address industry issues.

Objectives

The conference is brought to enhance the exchange of experience, ideas and knowledge from different speakers and participants across the world within its range of topics. Younger scholars are given the opportunity to present their works in the panel as well as the poster sessions. The Forum aims to make Bulgaria an attractive center for cutting-edge research, to raise the country's position in the field of agrarian science and to increase public confidence in it, to retain and attract young and leading scientists in Bulgaria and to provide higher qualifications and effective career development for scientists based on a high level of research.

The researches, reports and opinions presented at the scientific forum will be published and disseminated to all interested parties - researchers, economists, politically responsible persons, representatives of the agricultural business, farmers, teaching circles, students, etc.

Topics

- **Lessons from CAP Evolution**
- **Insights from different models on agricultural and rural support**
- **Socioeconomic challenges in rural areas**
- **Agricultural and commodity markets**
- **Food value chain**
- **Circular Economy and agriculture**
- **Agrienvironment and sustainability**

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CONTENT

CAP EVOLUTION, FIGURES AND TECHNICAL EFFICIENCY ANALYSIS

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ABSTRACT

As a consequence of the enlargement of the European Union in 2004 and the strictly financial constraints, the Common Agricultural Policy has radically changed its own targets and purposes by a new allocation of the financial items. The core aim of this research was to asses by a quantitative approach the role and impact of financial subsidies allocated by the Common Agricultural Policy to the technical efficiency in farms part of the FADN dataset since 2007 to 2017. In particular it has been used the environmental variables aimed at assessing if specific proxy variables with a nexus to the different socio-economic development in all European countries have acted towards the technical efficiency. Specific attention has been addressed to the new scenarios of changes in the CAP both in the first pillar and also in the second pillar. Furthermore, it has been assessed the imbalances of the Common Agricultural Policy financial supports in all European countries. Findings have pointed out the pivotal role of financial supports and other indirect payments to the technical efficiency of farms even if some countries have had meaningful imbalances which have demonstrated the role of the European Union in particular in the second pillar in reducing the marginalization in rural areas.
Keywords: *first pillar, second pillar, LFA, DEA, technical efficiency, imbalances.*

INTRODUCTION

The main goals of the Common Agricultural Policy (CAP) have been focused to support adequately farmers in the European countryside reducing the socio-economic divide between rural and urban areas (Galluzzo, 2013; 2018a; 2018b; 2019; Vieri, 1994; 2004; Van der Ploeg and Roep, 2003; Van der Ploeg et al., 2002). The main negative consequence of this political infrastructure in favour of European farmers was to increase the financial budget towards farms and the primary sector to the detriment of other economic sectors stimulating in the public opinion a growing and severe criticism to the CAP. By the early 2000s in the framework of the Cork Conference, which has addressed the attention of policy makers and other stakeholders to the rural development, the agricultural sector has been focused as an important pillar in protecting the rural areas.
The rural space has been pinpointed as a place able to supply positive externalities towards which to address lots of financial supports aimed at stimulating the viability of rural communities and in the same time reducing the socio-economic marginalization in these territories.
In the late 1960s when the Common Agricultural Policy has been established, the main three CAP's targets have been to protect the European agriculture against the price volatility, to ensure an adequate level of incomes to farmers by a system of prices and indirect financial supports in

agricultural commodities higher than international prices and to guarantee a self-sufficiency of many European agrarian productions (Vieri, 1994; 2012). This system of protectionism has been very expensive and counterproductive stimulating as a consequence an overproduction of commodities difficult to dispose of and able to absorb the vast majority of the European financial budget (Vieri, 2001; 2012; Cunha and Swinbank, 2011; Galluzzo, 2015).

In the same time, the main changes in the Common Agricultural Policy since the 1960s to the latest years have encouraged the European Union to end up a large exporter of agricultural productions and other commodities (Borrell and Hubbard, 2008).

In order to solve these economic and managerial bottlenecks, the European Commission has undergone the Common Agricultural Policy to crucial and complete significant transformations which comes under the framework of the development of a new model of agrarian production and an expansion of a more sensitive behaviour in urban citizens towards farmers and the countryside, which are able to produce positive or negative externalities (Galluzzo, 2015; 2018; Ilbery, 1998; Saxena et al., 2007). As argued by lots of authors, farmers by the CAP and some pilot initiatives financed by the Leader become dwellers and active agents of an endogenous and cohesive rural process of socio-economic development able to increase the level of involvement of rural communities in a local development processes of growth aimed at lessening socio-economic exclusion and marginalization as well (Galluzzo, 2015; Galluzzo, 2012).

Comparing the early 1990s to these last 20 years, it is important to underline as the changes in the Common Agricultural Policy have been radical and strictly demanding in specific strategies of management in farms (Beluhova-Uzunova et al., 2017). According to these latter authors the CAP has moved from a commodity-specific policy to a farmer-specific policy. Since 2003, the first pillar of the Common Agricultural Policy by the Single Payment Scheme (SPS) and by the Single Area Payment Scheme (SAPS) have been pivotal in supporting indirectly farmers in all Member states of the EU which is decoupled by the yield level. The second pillar of the CAP has had the purpose to support financially the diversification in rural areas supporting also disadvantaged rural areas at risk of severe depopulation and emigration even if the budget allocated in the Common Agricultural Policy has been significantly lower than the first pillar.

In general, the main bottleneck in the technical efficiency of farms and in the same time one of the most constraint in the assessment of the impact of financial subsidies allocated by the CAP are correlated to the farm dimension, its income and its socio-economic sustainability; hence, the payments allocated by the first pillar have acted predominately to the level of income, the dimension of farms and consequently this has enforced an arising demand of land capital endowment (Bartolini and Viaggi, 2013). In other European countries findings have pointed out a null effect of payments allocated by the second pillar to disadvantaged rural areas such as the financial payments and supports in favour of modern technology thus, it is not easy to focus the shift of financial resources from the first to the second pillar in order to increase the efficiency and job opportunities (Petrick and Zier, 2010; Galluzzo, 2015; 2018b; 2019).

A literature review has pointed out as lots of studies have investigated in depth by a quantitative approach the impact of financial subsidies allocated by the CAP towards European farms (Galluzzo, 2016a; 2016b) even if the effects have been different in reducing imbalances in farms in different investigated countries (Galluzzo, 2015; 2016b; Knigma and Oskam, 1987; Mishara et al., 2009). Furthermore, financial supports allocated by the Common Agricultural Policy have reduced farmer's income improving economic and technical efficiency even if the effect of decoupled payments towards the farm's technical efficiency is ambiguous and, in many times, with distorted effects to farmers (Galluzzo, 2016b; Swinbank, 2008; Zhu and Lansink, 2010; Rude,

2008; Ciaian and Swinnen, 2006; Ciaian et al., 2014; Rizov et al., 2013). As a consequence of MacSharry reform and Agenda 2000 noteworthy has been the impact of direct payments paid by the first pillar of the Common Agricultural Policy on the farmer's net income and on the income distribution (Keeney, 2000; Galluzzo, 2016b). By contrast, Von Witze and Noleppa in 2007 have argued as direct payments in German farms have had an unequal distribution and in the same time some constraints in CAP subsidies allocation did not affect smaller farms even if subsidies in favour of disadvantaged rural areas or Less Favoured Areas (LFA) have acted to a fair development in the countryside stimulating the multifunctionality in agriculture. Other research's outcomes have stressed a significant but modest nexus between financial supports provided by the CAP and the rural areas development (Shucksmith et al., 2005, Crescenzi and Rodriguez-Pose, 2011; Galluzzo, 2016a; 2016b; 2019).

AIM OF THE RESEARCH

Considering the different enlargements of the European Union occurred in 2004, 2007 and in 2013, the core purpose of this research was to assess by a quantitative approach the impact of financial subsidies allocated by the Common Agricultural Policy towards the technical efficiency in farms part of FADN dataset.
The main research question has been addressed to investigated in depth which variables have affected the technical efficiency and also if there are some unbalances among countries in using the financial supports allocated by the European Union. Another research question was: are there some environmental variables able to act to the technical efficiency? In order to answer to this question, the research has been addressed considering the variables: socio-economic divide between rural areas and the time of belonging to the European Union.
In order to assess quantitatively the effects and impacts of the CAP financial supports it has used the data published by the Farm Accountancy Data Network since 2004 to 2017.
Summing up, the main target of study of this research was to assess the role of subsidies allocated by the Common Agricultural Policy in reducing socio-economic imbalances in European countries and if it has been more or less technically efficient and adequate to different European countries considering also the effect of a shrinkage in financial subsidies allocated to farmers in the second pillar of the CAP.

METHODOLOGY

The research has been split in two sections, aimed at assessing in a quantitative approach, the impact of the Common Agricultural Policy subsidies to different European countries since 2007 to 2017:

1) analysis of technical efficiency in EU farms estimating also the environmental variables to the efficiency;
2) analysis of inequalities of the first and second pillars subsidies in all 27 EU member states.

For the analysis it has used the data published by the European Union in its sample network of farms part of the Farm Accountancy Data Network (FADN) set up by the European Commission in the early 1960s aimed at assessing the income, farm productions and subsidies allocated by the Common Agricultural policy towards farmers.
Studies about the technical efficiency in farms have pointed out two main approaches of quantitative study based on a parametric approach and a non-parametric approach.

The parametric approach by the Stochastic Frontier Analysis (SFA) needs a specific function of production such as Cobb-Douglas, Logarithmic function, Translog. The non-parametric model or DEA (Data Envelopment Analysis) has the main purpose of estimating the efficiency defining a function of optimal combination of inputs and output and the distance from the frontier of this hypothetical function of production is able to assess an index of technical inefficiency (Bielik and Rajcaniova, 2004; Galluzzo, 2013; 2016a; 2017; 2018a). The higher is the distance from this frontier the lower is the technical inefficiency of the enterprises or Decision Making Units (DMU) (Galluzzo, 2019; 2017; Latruffe et al., 2017). By an increase or decrease in input or output it is possible to get move the DMU_j from an inefficient position to an efficient one. Summing up, efficient farms are located along the hypothetical function of production and some of them outside this frontier are not efficient (Galluzzo, 2015; 2016a; 2017).
In the non-parametric model, some fluctuations from the frontier of the function of production, are considered inefficient thus, the technical efficiency is described as a set of capabilities of farmers, in function of the used approach such as input or output oriented, in maximizing the output minimizing simultaneously the used inputs or vice versa (Bojnec and Latruffe, 2008).
In this paper, the technical efficiency in all European farms part of the FADN dataset since 2007 to 2017 has been estimated by a non-parametric model applied to specific assumptions of a variable return to scale (VRS) input oriented model (Farrel, 1957; Battese, 1992; Coelli, 1996) using R-Studio software and PIM-DEA.
The purpose of DEA linear programming model is to minimize in a multiple-input model in each farm the technical efficiency which is a ratio of efficiency (h) written in a mathematical model as (Papadas, 1991):

$$\max h = \Sigma_r u_r yrjo/\Sigma_i v_i x_{ijo} \quad (1)$$

s.t.
$\Sigma_r u_r y_{rj}/ \Sigma_i v_i x_{ij} \leq 1$ j= 0, 1, ...n (for all j)
$u_r , v_i \geq 0$

u_r v_i are specific vectors connected to the produced output
y_{rjo} is the output level
x_{ijo} is the input level

Focusing the attention to the productivity only, if there are two farms, i.e a and b, called also Decision Making Unit (DMU_a and DMU_b), able to produce two levels of output such as y_a and/or y_b using a specific quantity of input x_a and x_b , the productivity is a simple ratio between produced output and used input which can be decomposed as a simply ratio between y_a /x_a and y_b /x_b for the DMU_b. The value of efficiency should be greater to 0 and lower than 1 which is the frontier of technical combinations of input-output (Bhagavath, 2009; Galluzzo, 2013; 2015; 2016; 2017).
The non-parametric linear model estimated by the Data Envelopment Analysis has been investigated and described for the first time in 1978 (Charnes et al., 1978) and it is generally useful in estimating the relative efficiency in each Decision Making Unit based on different combinations of input and output in the productive process (Hadad et al., 2007) with the purpose to minimize the level of input in the process of production maximizing in the same time the produced output (Doyle and Green, 1994). The core purpose of a non-parametric input-oriented model estimated by the DEA is to minimize in a multiple-output model the multiple-input in each farm that is a

ratio of efficiency. This model has lots of possible solutions and u_r* and v_i* are two parameters able to define the optimal solution of efficiency made by two parameters with a link to the optimal combination of input (x*) and output (y*) able to solve the problem of efficiency (Bhagavath, 2009; Papadas, 1991).
If the optimal level of technical efficiency (h) is 1 or 100% there are not issues about the efficiency because this unit (DMU_{h1}) is the most efficient enterprise hence, it is the best solution of the problem or rather it is the benchmark for other DMU_s and in any case it is more efficient compared to other DMU_{hn} of the dataset (Bhagavath 2009; Galluzzo, 2016a; 2016b; 2017). By contrast, as argued by Bhagavath in 2009 and also according to these previous authors, any value of h above 100 or 1 implies lots of units (DMU_{hn}) more efficient than this unique and inefficient unit (DMU_{h1}). This is a negative bottleneck hence, in order to solve this weakness is fundamental to transform the model in a linear function by a linear monotone transformation methodology called CCR (Charnes and Cooper, 1962; Bhagavath, 2009) written in this way:

$$\max h = \Sigma_r u_r y_{rjo} \quad (2)$$

s.t. dual variable

$$\Sigma_i v_i x_{ijo} = 100\% Z_o$$
$$\Sigma_r u_r y_{rjo} - \Sigma_i v_i x_{ijo} \leq 0$$
with j = 0, 1, ...n (for all j)
$$\lambda_j - v_i \leq -\varepsilon_i = 0, 1, \ldots, n$$

m and ε is a positive value $s_i + u_r \leq -\varepsilon_r = 0, 1, \ldots t$ and ε is a positive value $s_r - \lambda_j$ are shadow prices able to reduce the efficiency in each unit lower than 1 or 100% and a positive value of λ_j is able to assess a peer group in some inefficient unit.
In the dual problem, it is important to consider a dual variable in each constraint in the primary model (Charnes et al., 1978; Andersen and Petersen, 1993). In mathematical terms the solution of the dual model above mentioned can be written as:

$$\min 100 Z_o - \varepsilon \Sigma i s_i + -\varepsilon \Sigma_r s_r^- \quad (3)$$

s.t.
$$\Sigma_j \lambda_j x_{ij} = x_{ijo}$$
$$Z_o - s_i + i = 0, 1, \ldots m$$
$$\Sigma_j \lambda_j x_{rj} = y_{rj0} + s_r - r = 0, 1, \ldots t$$
$$\lambda_j, s_i^+, s_r^- \geq 0$$

Charnes, Cooper and Rhodes in 1978 and Banker, Charnes and Cooper in 1984 have investigated the efficiency by the DEA assuming that there are *n* DMUs which produce a quantity *s* of output y in such a way that the $y \in R^{s+}$ using *m* inputs in multiple arrangement and combination of $x \in R^{m+}$.
The technical efficiency of a DMU_k under the assumption proposed by Charnes, Cooper and Rhodes in 1978 can be estimated by solving a linear programming problem minimizing the level of input used in the production process (Coelli et al. 2005; Battese and Coelli, 1992):

$$\min \theta_k^c - \varepsilon(\sum_{i=1}^{s} S_i^- + \sum_{r=1}^{m} S_r^+) \quad (4)$$

$$s.t. \ \sum_{j=1}^{n} \lambda_j \ x_i \ + S_i^- = \quad \theta_0 \ x_{ik} \ , \ i = 1, 2 \dots , m,$$

$$\sum_{j=1}^{n} \lambda_j \ x_i \ + S_i^- = \quad \theta_0 \ x_{ik} \ , \quad i = 1, 2 \dots , m,$$

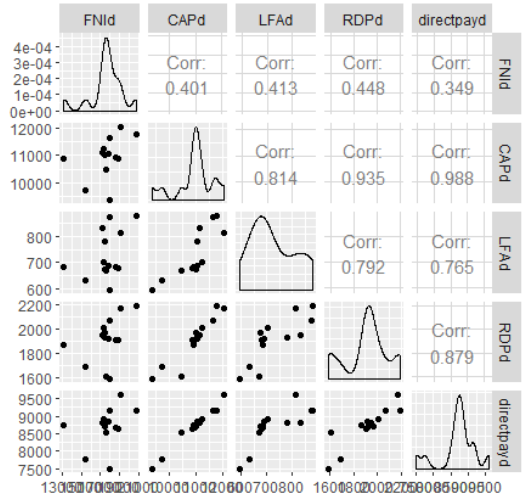
$$\sum_{j=1}^{n} \lambda_j \ y_{ij} - S_r^+ = y_{rk} \ , \ r = 1, 2 \dots , s,$$

$$\theta_k^c \ , \lambda_j \ , S_i^- , S_r^+ \geq 0,$$

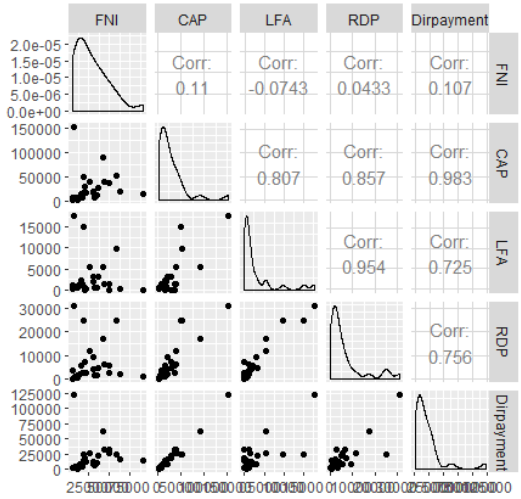
The aim of the DMU is to assess the value of θ which is the optimal level of technical efficiency equal to 1; ε is a non-Archimedean infinitesimal, proposed by Charnes et al. in 1978, aimed at overcoming some difficulties linked to test multi-optimum solutions and λ is a convex coefficient in the input x in each DMUj producing a level of output y in the farms j (Coelli et al. 2005; Battese and Coelli, 1992).
S_r^+ and S_r^- are a non-negative output and input slacks and if θ is equal to 1and all input and output slacks are equal to zero the DMU is operating on the CRS frontier and it is technical efficiency (Charnes et al., 1978, Banker et al., 1984; Coelli et al. 2005; Battese and Coelli, 1992). If θ is not equal to 1 and all input and output slacks are different to zero there is an inefficient use of resources as input or output in the enterprise.
With the purpose to assess if some environmental variables have acted to the technical efficiency in the nonparametric approach such as the DEA it has used the approach proposed by Simar and Wilson in 2007 (Simar and Wilson, 2011; 2015; Daraio and Simar, 2005). In order to estimate the role of two typologies of environmental variables such as the level of poverty in EU country, which is a proxy variable of the role of agriculture in the society because a poor country could be very depending on the agriculture, and the time of accession to the European Union, using a dummy variable 1 if the country is a member of the EU before 2004 and 0 otherwise, it has used the test of separability. The separability has been tested with the core aim to assess if the environment variables hav had a significative role on the technical efficiency using the test as proposed in literature (Simar and Wilson, 2007; 2015; 2011; Deraio et al., 2015; Daraio and Simar, 2005).
The second part of this research has estimated by the Lorenz curve the imbalances in farm net income and financial subsidies allocated by the first and second pillar of the Common Agricultural Policy in all farms part of FADN. The Lorenz curve is a simple graphical representation of distribution of income or of wealth proposed in 1905 by Lorenz aimed at describing the inequality of distribution. The graph assesses the percentage of people (x axis) on the percentage of income on the *y*-axis (Gastwirth, 1972). Roughly speaking the Lorenz curve is estimated by a function L(F), where F is the cumulative portion of the population on the horizontal axis and L is the cumulative of the total income described in the vertical axis with a value between 0 to 1 (Gastwirth, 1972; Lorenz, 1905). The points long the bisector is in equilibrium and by contrast the values

under this line are not in equilibrium. The software used in this paper to assess the Lorenz curve was STATA IC13.

Fig. 1- Main correlations among some financial subsidies allocated by the CAP and farm net income



2007



2017

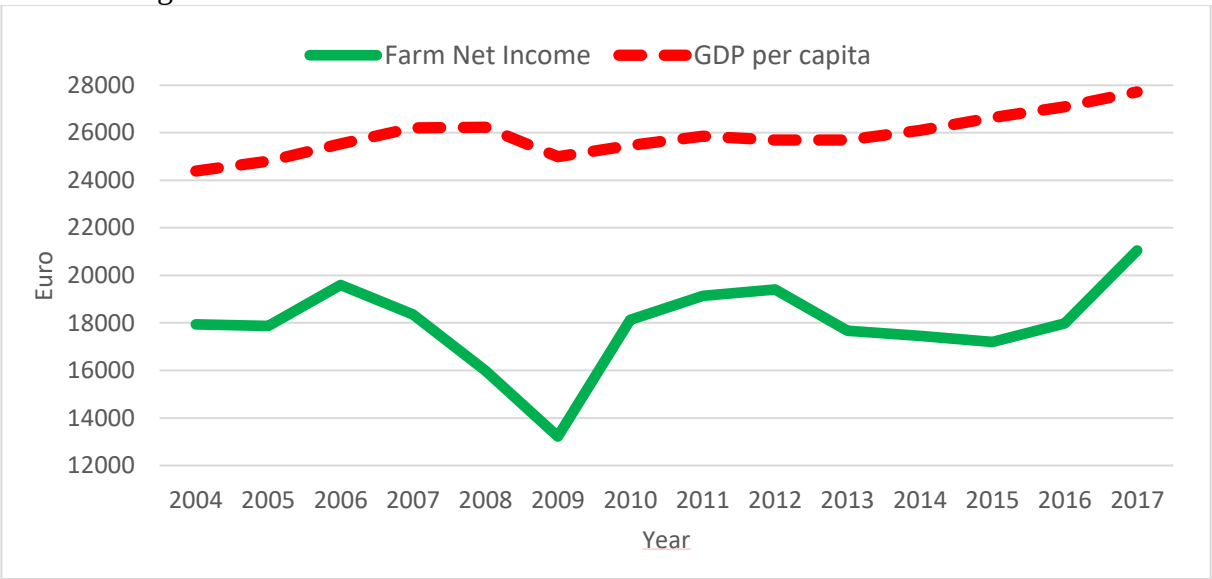
Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

RESULTS AND DISCUSSION

The main findings about the correlation of the main financial subsidies allocated by the first and second pillar of the Common Agricultural Policy in 2007, using data in constant values, and in 2017 have pointed out a strong link between direct payments, disbursed in the first pillar, and total financial subsidies allocated by the Common Agricultural Policy. By contrast, a poor value of correlation has been found between farm net income and direct payments. This has corroborated as decoupled payments could have a significant effect and a direct path dependency to the total amount of financial supports allocated by the European Union to the primary sector. Focusing the attention to the year 2017, research findings have pointed out the same situations investigated in 2007 even if there has been assessed an indirect link, even if very modest, between farm net income and direct payments to less favoured areas or LFA.

In general, between the variables farm net income and rural development programme (RDP) financial subsidies and total amount of financial payments paid by CAP there has been a modest relationship. This partially has emphasized a decrease of impact of the CAP payments and supports as a consequence of the main changes in the Common Agricultural Policy strategies with a significant reduction of the impact of the payments in the second pillar.

Fig. 2- Differences in income comparing Farm Net Income (FNI) in farms part of FADN dataset and the average value of GDP

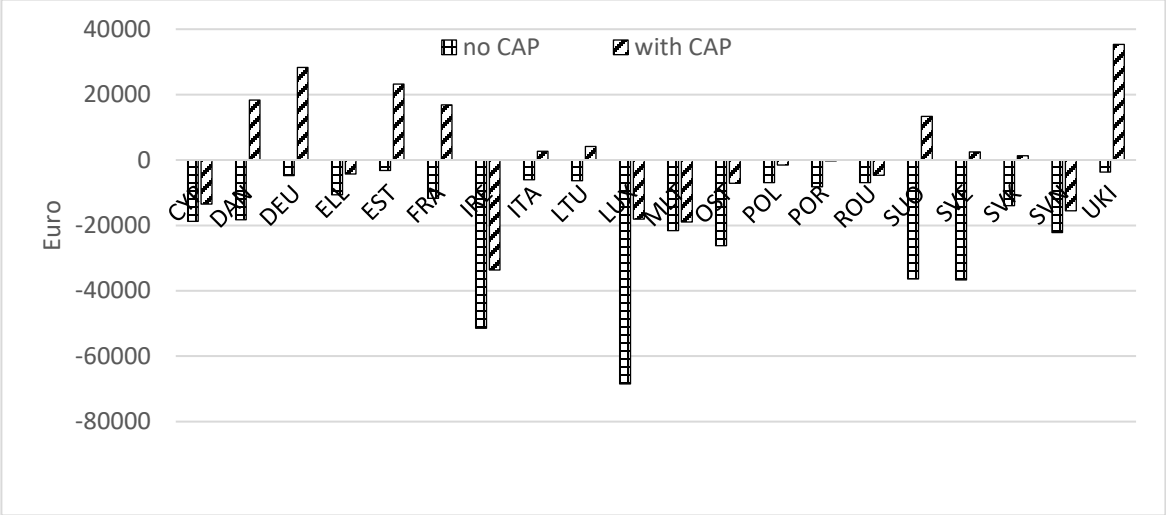


Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm and EUROSTAT

Addressing the analysis to the role of the financial subsidies allocated by the Common Agricultural Policy to the total farm net income in all EU countries different imbalances have been found among countries. A this point it has used the as benchmark the level of average income in each nation in terms of GDP per capita compared to the FNI estimated in every EU country over the time 2004-2017 (Fig. 2). Findings have pointed out an increasing gap between farmer's income and the average level of income assessed as GDP deepening the socio-economic divide between urban and rural areas.

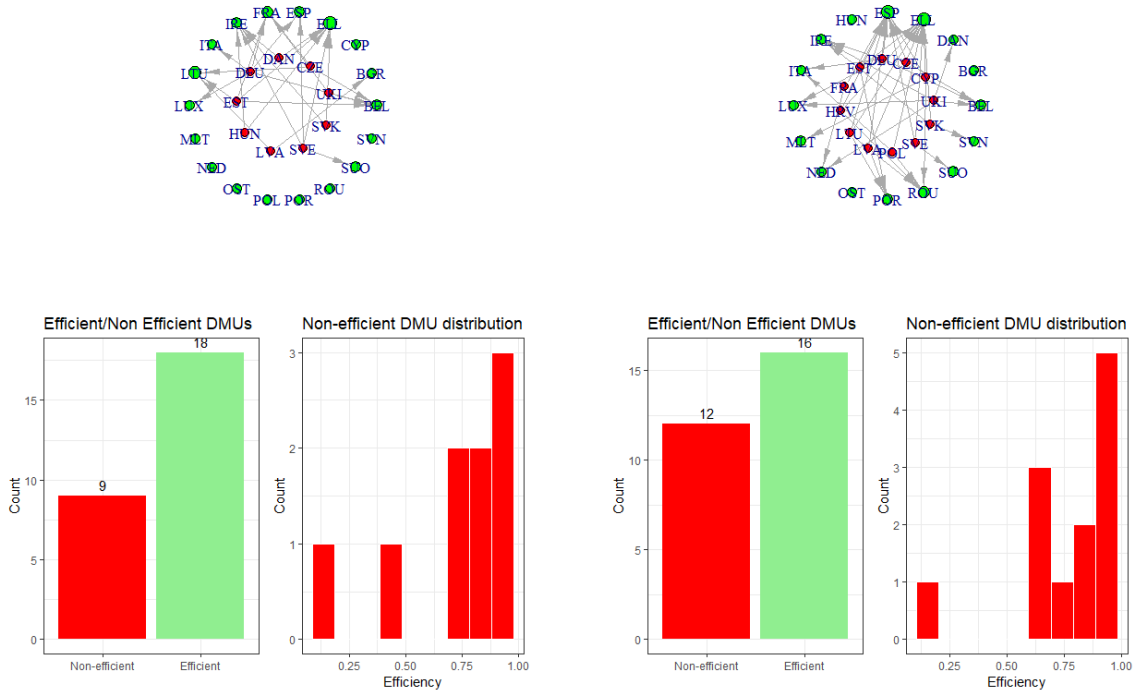
Comparing the farm net income in all EU countries in 2017, adjusted by the economic effect of financial payments and direct supports allocated by the CAP, to the average level of per capita average income in 2017 research's outcomes have stressed as positive has been the effect of CAP decoupled payments and other financial supports in increasing the level of income in farms part of FADN dataset (Fig. 3) and this has been particularly meaningful in few new comer member states of the European Union corroborating also the pivotal role of financial supports allocated by the CAP in increasing the general living conditions in the countryside reducing the socio-economic marginalization and permanent emigration.

Fig. 3- Differences in income comparing FNI with (with CAP) and without financial public supports (no CAP) in farms part of FADN dataset and the average value of per capita GDP



Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm and EUROSTAT

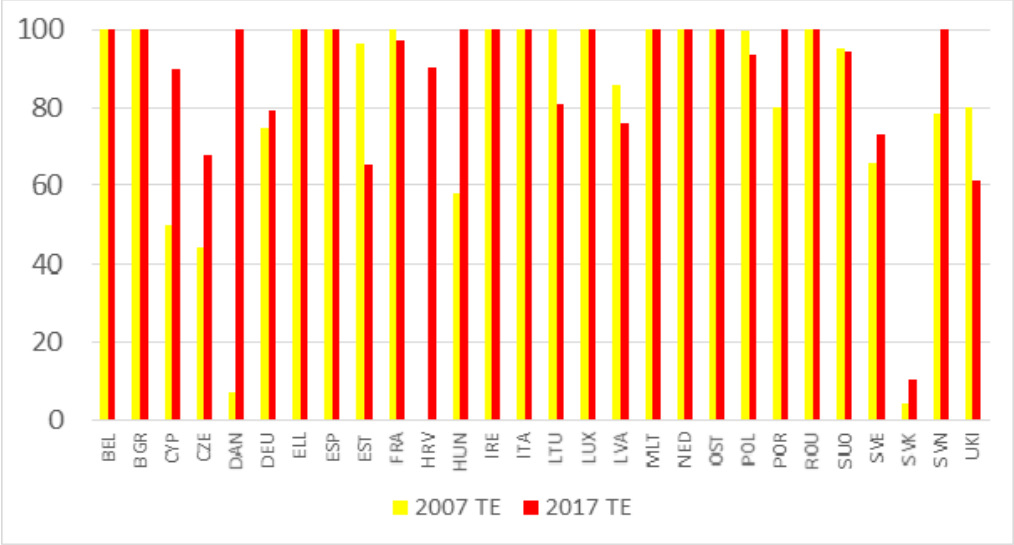
Fig. 4- Main results in the technical efficiency analysis in 2007 and in 2017 in the EU countries part of FADN dataset



Year 2007 **Year 2017**

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

Fig. 5- Comparing the technical efficiency (TE) in all farms part of Farm Accountancy Data Network dataset in 2007 and 2017



Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

Focusing the attention on the technical efficiency, findings in the FADN dataset have pointed out significant fluctuations over the time of investigation. Considering the constant value in 2007 outcomes have pointed out an increase of non-efficient farms. In fact, while in 2007 only 9 countries out of 27 were technical inefficiently in 2017 12 countries out of 28 have been inefficient (Fig. 4).

It is important to underline as in 2007 the vast majority of inefficient farms have been located in the new member states part of the EU; by contrast, in 2017 old member states of the EU belonging to the European Union since 1957 as France have pointed out a significant concentration of technically inefficient farms in the FADN dataset. The increase of technically inefficient farms in 2017 compared to the year 2007 has been underlined by the red points in the inner circle of the efficiency analysis assessed using the Rstudio software.

In many EU countries with the exception of Latvia, Estonia, Finland, Poland, United Kingdom and Lithuania there has been a significant increase of technical efficiency even if in Slovakia it has been found the poorest level of technical efficiency in farms with a sharply increase in the last 10 years of investigation (Fig. 5).

Summing up, nations with an optimal level of technical efficiency close to 1 in 2007 have corroborated the same trend in 2017 and this seems to confirm as the new member states belonging to the EU recently have increased their level of technical efficiency but with more difficulties than the old core states part of the European Union.

In 2004 nations with technically inefficient farms have pointed out as it is important to implement some inputs such as the labour capital; findings in Slovakia and Poland have underlined the need to reduce significantly in these countries the labour endowment in farms (Tab.1). Focusing the attention to the financial subsidies allocated by the first and second pillar of the CAP research outcomes have pointed out the need to increase strongly the decoupled payments in Slovakia and Denmark disbursed by the first pillar of the Common Agricultural Policy; by contrast, Finland and United Kingdom have underlined a significant decrease of disbursed payments in the first pillar of the CAP. The second pillar financial subsidies have to be reduced in Estonia, Poland and in

Finland; on the contrary, Denmark and Slovakia need a significant increase in direct financial supports and payments allocated by the second pillar of the Common Agricultural Policy.

Tab. 1- Main gains in percentage in the targets assessed in some variables investigated in 2004 by the technical efficiency not oriented model.

Country	Variable					
	Labour	**Usable agricultural areas**	**Farm net income**	**Total assets**	**Rural Development Programme**	**First pillar subsidies**
BEL	0.00	0.00	0.00	0.00	0.00	0.00
BGR	-	-	-	-	-	-
CYP	1.85	33.66	33.66	25.40	33.66	25.24
CZE	-2.28	1.82	35.76	35.76	-12.02	24.58
DAN	86.54	77.22	86.54	75.36	86.54	77.99
DEU	14.48	9.30	14.48	-2.98	14.48	12.47
ELL	0.00	0.00	0.00	0.00	0.00	0.00
ESP	0.00	0.00	0.00	0.00	0.00	0.00
EST	-23.27	-57.23	1.58	1.58	-62.29	-17.67
FRA	0.00	0.00	0.00	0.00	0.00	0.00
HRV	-	-	-	-	-	-
HUN	26.34	-23.77	26.34	26.34	12.30	13.83
IRE	0.00	0.00	0.00	0.00	0.00	0.00
ITA	0.00	0.00	0.00	0.00	0.00	0.00
LTU	0.00	0.00	0.00	0.00	0.00	0.00
LUX	0.00	0.00	0.00	0.00	0.00	0.00
LVA	-1.39	-21.56	7.04	7.04	-39.81	-21.32
MLT	0.00	0.00	0.00	0.00	0.00	0.00
NED	0.00	0.00	0.00	0.00	0.00	0.00
OST	0.00	0.00	0.00	0.00	0.00	0.00
POL	-61.82	-48.17	0.14	0.14	-51.58	0.14
POR	-8.72	-27.95	11.02	11.02	-27.97	11.02
ROU	-	-	-	-	-	-
SUO	2.48	-31.77	2.48	2.48	-74.55	-64.30
SVE	20.73	-13.40	20.73	20.73	-2.35	-12.54
SVK	92.32	86.80	92.32	92.32	86.39	92.24
SVN	-41.34	-2.27	12.03	-7.90	-8.64	12.03
UKI	1.07	-47.22	7.57	-28.57	1.51	-24.13

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

Findings in 2017 have pointed out in farms part of FADN dataset the need of increase the labour capital and in some cases to increase the land capital endowment (Tab. 2). Addressing the attention to the role and impact of financial subsidies allocated by the first and second pillar of the CAP, the main results in terms of gain of technical efficiency in all European countries have underlined as the financial subsidies in the first pillar have to be increased in Slovakia. On the contrary, in many

other EU countries research outcomes have underlined the need of decreasing the decoupled payments. The payments allocated by the second pillar have to be predominantly increased in particular when there is a decline in payments allocated by the first pillar of the Common Agricultural Policy.
Summing up, the comparison between the year 2017 to 2007 has pointed out as 13 EU countries out of 28 have been technically efficient both in 2017 and also in 2007. Denmark and German have had a decline of their target gains; a gain target increase in the second pillar payments has been assessed in Czech Republic, Finland, Sweden and United Kingdom. The first pillar gain target has been negative in 14 EU countries out of 28.

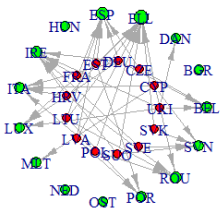
Tab. 2- Main gains in percentage in the targets assessed in some variables investigated in 2017 by the technical efficiency not oriented model.

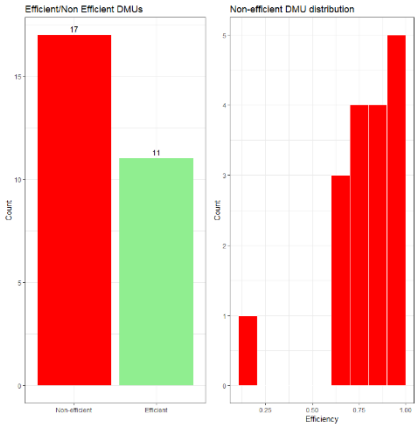
Country	**Variable**					
	Labour	**Usable agricultural areas**	**Farm net income**	**Total assets**	**Rural Development Programme**	**First pillar subsidies**
BEL	0.00	0.00	0.00	0.00	0.00	0.00
BGR	0.00	0.00	0.00	0.00	0.00	0.00
CYP	8.80	3.80	8.80	8.80	-11.80	8.80
CZE	-36.29	-46.58	14.70	14.70	-59.55	-50.60
DAN	0.00	0.00	0.00	0.00	0.00	0.00
DEU	1.54	-22.27	8.66	1.18	8.66	-25.39
ELL	0.00	0.00	0.00	0.00	0.00	0.00
ESP	0.00	0.00	0.00	0.00	0.00	0.00
EST	25.67	-20.94	25.67	25.67	-18.76	-10.75
FRA	1.74	-37.44	1.74	1.74	-29.76	-44.03
HRV	7.97	0.07	7.97	7.14	-44.28	-22.32
HUN	0.00	0.00	0.00	0.00	0.00	0.00
IRE	0.00	0.00	0.00	0.00	0.00	0.00
ITA	0.00	0.00	0.00	0.00	0.00	0.00
LTU	13.62	-26.96	13.62	13.62	13.62	-13.93
LUX	0.00	0.00	0.00	0.00	0.00	0.00
LVA	18.04	-21.88	18.04	18.04	-13.59	-9.59
MLT	0.00	0.00	0.00	0.00	0.00	0.00
NED	0.00	0.00	0.00	0.00	0.00	0.00
OST	0.00	0.00	0.00	0.00	0.00	0.00
POL	-17.45	-35.59	3.78	-35.88	3.78	-28.45
POR	0.00	0.00	0.00	0.00	0.00	0.00
ROU	0.00	0.00	0.00	0.00	0.00	0.00
SUO	4.61	-49.30	4.61	4.61	-80.65	-57.15
SVE	21.56	-10.77	21.56	21.56	-17.02	-7.42
SVK	89.15	80.93	89.15	89.15	83.26	82.67
SVN	0.00	0.00	0.00	0.00	0.00	0.00
UKI	3.16	-33.56	16.35	-15.74	16.35	-12.42

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

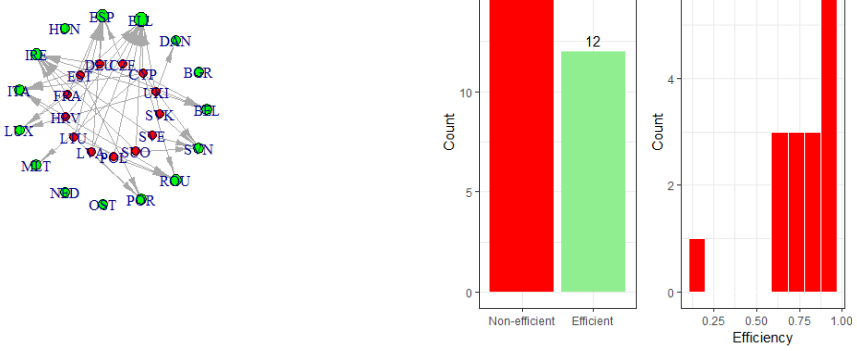
With purpose to assess the impact of a reduction of the financial subsidies allocated by the second pillar of the Common Agricultural Policy using the previous data published in 2017 by the Farm Accountancy Data Network (FADN), we have estimated as a shrinking respectively of 20% and 50% of funds supporting financially the second pillar has had towards the technical efficiency in all European nations more or less the same impacts.
The impact of a drop in financial subsidies allocated by the second pillar of the CAP has had in both cases a negative effect in all EU countries; in fact, there has been a reduction of one nation only from an optimal situation to an inefficient one (Fig. 6). Roughly speaking findings have pointed out as very negative has been the impact of a reduction of financial supports to farms part of FADN dataset.
By contrast, in order to assess the role of financial subsidies allocated by the first pillar of the Common Agricultural Policy, this research has assessed as a drop of 20% and 50% of decoupled payments in the first pillar of the CAP has implied a positive role of the first pillar subsidies than the second one in the improvement of technical efficiency in farms. In fact, assessing a reduction from 20% to 50% of the first pillar subsidies in terms of decoupled payments linked to an increase of payments allocated by the second pillar equal 50% with the purpose to stimulate the multifunctionality in farms, findings have underlined an increase of inefficient farms in some European countries (Fig. 7).This unfortunately has corroborated as the first pillar financial subsidies have had a positive role in increasing the technical efficiency in farms; in fact, a decrease of direct payments allocated by the first pillar even if associated to a significant growth of supports for the rural development did not affect the increase of technical efficiency.

Fig. 6- Main results in the technical efficiency analysis in 2017 in the EU countries part of FADN dataset considering a reduction in financial subsidies allocated by the second pillar of the Common Agricultural Policy





Reduction of 20%



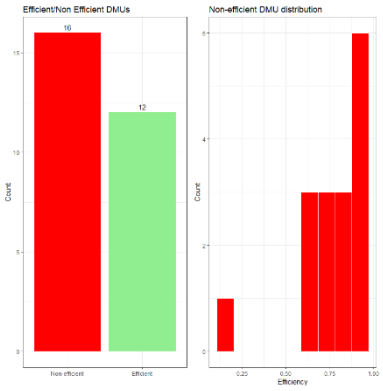
Reduction of 50%

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

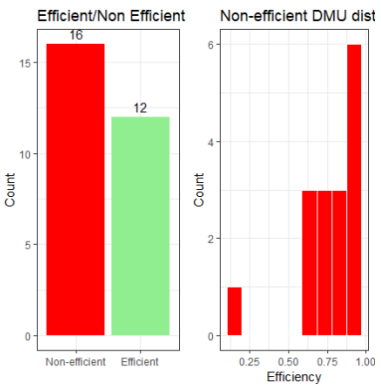
The average value of technical efficiency in all investigated farms in each member states of the European Union has pointed out as an increase of scale in farms has had a positive impact in the growth of efficiency and in the same time a variable return to scale (VRS) has acted positively on the technical efficiency in farms (Tab. 3).

In 14 countries out of 27 the value of technical efficiency has been optimal and equal to 1; by contrast, Slovakia, Finland and Czech republic have had the lowest level of technical efficiency and in the same time findings have underlined as a not so meaningful incidence of new comers member states in increasing the level of technical efficiency which in many cases has had a modest level of technical efficiency under the optimal threshold equal to 1. Summing up, the technical efficiency in average value has been has been under the optimal value close to 1.

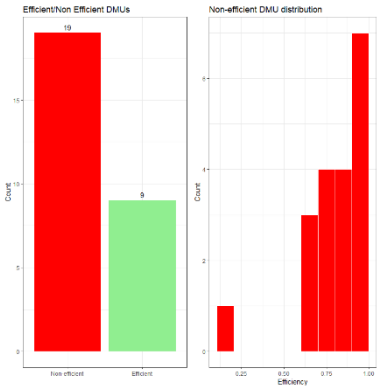
Fig. 7- Main results in the technical efficiency analysis in 2017 in the EU countries part of FADN dataset considering a reduction in financial subsidies allocated by the first pillar of the CAP and an increase in the second pillar



-20% of first pillar and no changes in second pillar



-20% of first pillar and second pillar increasing of 50%



-50% of first pillar and second pillar increasing of 50%

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

Comparing the technical efficiency since 2004 to 2016 in all European farms findings have underlined an increase of inefficient nations in 2009 and in 2010 due probably at the economic crises occurred in these years even if in general there have been significant fluctuation over the time with some inefficient nations as pointed out by the red points and some of them that over the time have been under the optimal level close to 1 (Tab. 4).
Summing up, the analysis of the technical efficiency since 2004 to 2016 has pointed out a decrease till 2007 of technical inefficiency in all investigated European countries even if the economic crises in 2009-2011 has had significative effects in reducing the inefficiency. Furthermore, changes in the Common Agricultural Policy during the seven-year time 2014-2020 have had an impact to the European countries with meaningful fluctuations both over the time of study and also between the different European countries.
In the first phase the input variables investigated have been financial subsidies allocated by the second pillar of the CAP and the direct payments disbursed by the first pillar. In the second phase, it has used as input variables labour capital, usable agricultural areas, cost made by the cost of seeds, fertilizers, feed grazing, machinery, energy in farms and financial subsidies allocated by the second and first pillar of the Common Agricultural Policy. The further stage on the assessment of technical efficiency considering the environmental variables has been focused in order to investigate the impact of a reduction or a growth of financial subsidies allocated in a percentage estimated in 20% and 50% to the farms part of the FADN dataset.
The estimation of environmental variables has been done using the Rstudio software during the year 2017 in all EU countries, however due to some outliner values assessed in Slovakia the analysis has been focused on only 27 countries. In the two stage DEA analysis it has used the values of delta double hat which is a measure of the reciprocal of DEA score in terms of distance function in an input-oriented model after the second loop in a bootstrap method of estimation. In this research, it has used two different scenarios in order to estimate the impact of a reduction or an increase of financial subsidies allocated in the second pillar of the Common Agricultural Policy in two different input oriented model: one with only two inputs made by RDP financial supports and decoupled payments and another complete model made by the items input cost, labour cost and land capital endowment in terms of usable agricultural areas.

Tab. 3- Technical efficiency in all European countries since 2007 to 2017 investigated in farms part of FADN dataset

Nations	Constant Return to Scale (CRTS)	Variable Return to Scale (VRTS)	Scale	
BEL	1.000	1.000	1.000	-
BGR	1.000	1.000	1.000	-
CYP	0.828	0.893	0.927	irs
CZE	0.475	0.680	0.699	drs
DAN	1.000	1.000	1.000	-

DEU	0.793	0.794	0.999	irs
ELL	1.000	1.000	1.000	-
ESP	1.000	1.000	1.000	-
EST	0.587	0.656	0.895	irs
FRA	0.961	0.972	0.988	irs
HRV	0.741	0.900	0.822	irs
HUN	1.000	1.000	1.000	-
IRE	1.000	1.000	1.000	-
ITA	1.000	1.000	1.000	-
LTU	0.754	0.809	0.932	irs
LUX	1.000	1.000	1.000	-
LVA	0.692	0.757	0.914	irs
MLT	1.000	1.000	1.000	-
NED	1.000	1.000	1.000	-
OST	1.000	1.000	1.000	-
POL	0.815	0.934	0.873	irs
POR	1.000	1.000	1.000	-
ROU	1.000	1.000	1.000	-
SUO	0.652	0.943	0.692	irs
SVE	0.569	0.731	0.779	irs
SVK	0.045	0.104	0.435	irs
SVN	0.836	1.000	0.836	irs
UKI	0.612	0.613	0.998	drs
mean	0.834	0.885	0.921	-

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

In general, the complete model has pointed out a higher level of technical efficiency than the reduced model with only two input (Fig. 8). Italy and other old European countries part of the EU since 1957 have pinpointed with the exception of Estonia the highest amounts of technical efficiency in the light of the second loop. Focusing the attention on the complete model, an increase

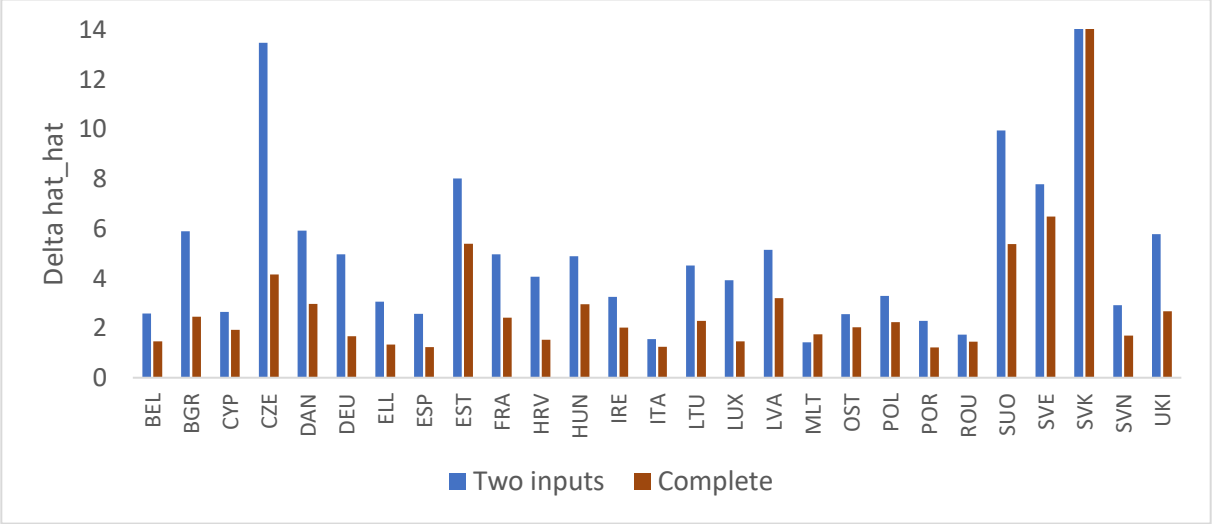
of financial subsidies allocated in the second pillar of the Common Agricultural Policy of 20% has had ambiguous effects in different European countries (Fig. 9) even if a more consistent increase of subsidies disbursed in the framework of the second pillar has increase the level of technical efficiency in farms.

Tab. 4- Main results in the technical efficiency analysis in the European Union countries part of FADN dataset

Year	Efficient		Not efficient	
	Old member states of UE	New member states of UE	Old member states of UE	New member states of UE
2004	9	5	6	5
2005	11	6	4	4
2006	11	6	4	4
2008	12	6	3	6
2009	9	5	6	7
2010	9	3	6	9
2011	13	6	2	6
2012	11	6	4	6
2013	11	5	4	8
2014	11	5	4	8
2015	11	5	4	8
2016	8	6	7	7

Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

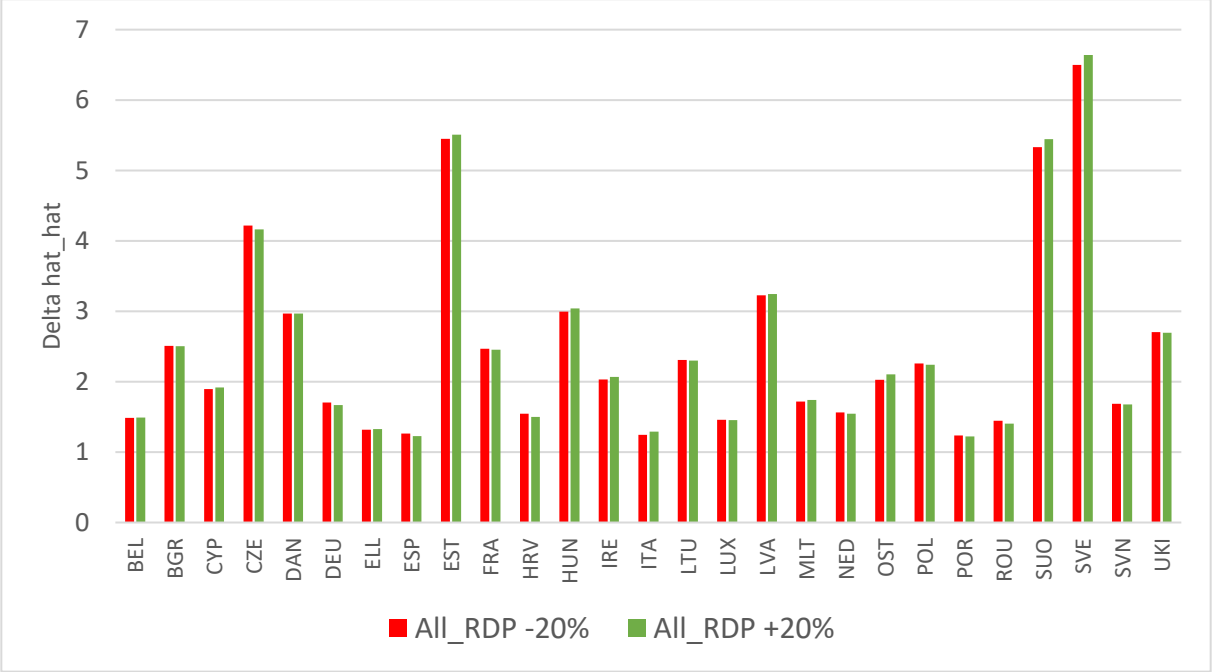
Fig. 8- Main results in the reciprocal of technical efficiency analysis of environmental variables in the European Union countries part of FADN dataset



Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

The separability in the first and second phase of investigation has underlined a value very high which has implied a direct impact of environmental variables to the technical efficiency estimated by the second step based on the bootstrap simulation. In fact, using the method proposed by Deraio et al. in 2015, values of separability test have pointed out in both the simulations, changing the input variables involved in the dataset, an impact of 78% and 90% which has implied a direct effect of the environmental variables towards the efficiency and its shape.

Fig. 9- Main results in the reciprocal of technical efficiency analysis with environmental variables considering an increase or a decrease of financial subsidies (RDP) allocated by the second pillar of the CAP

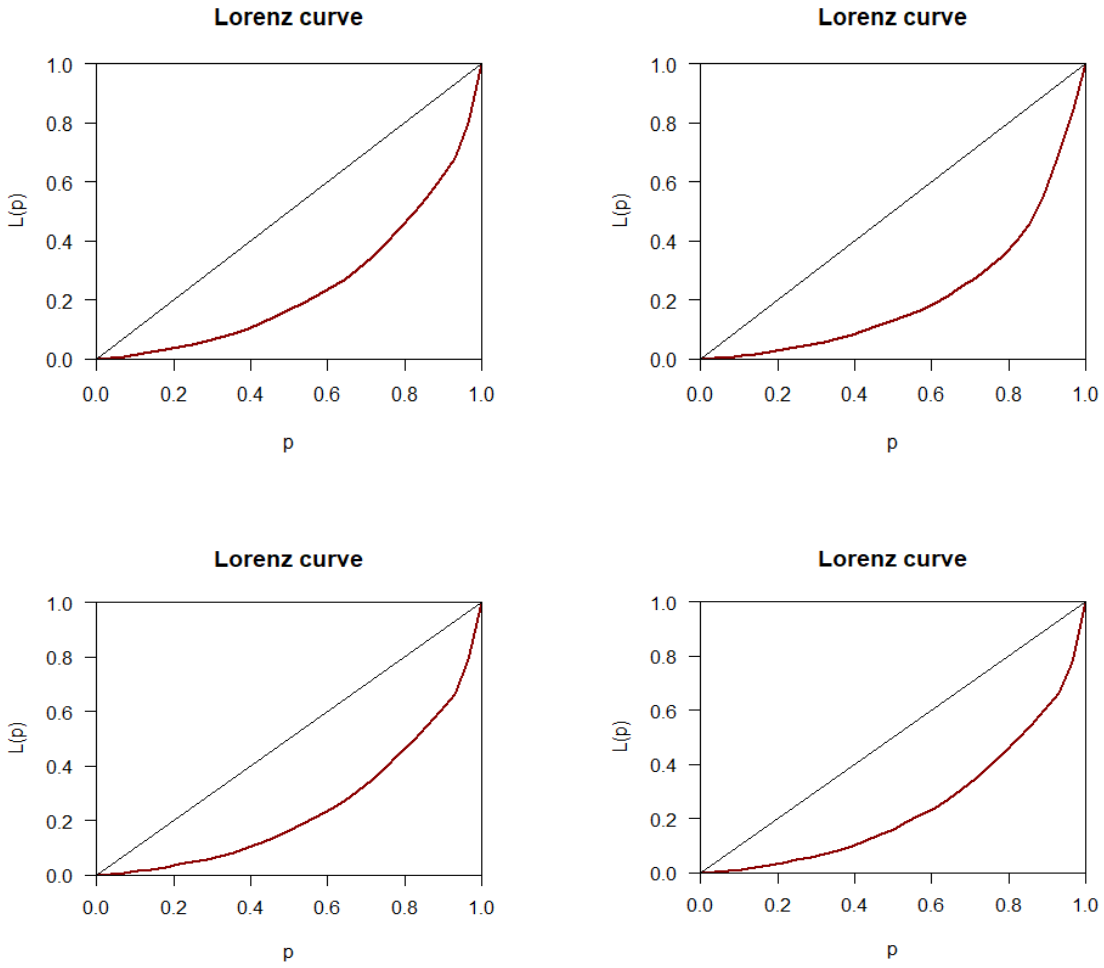


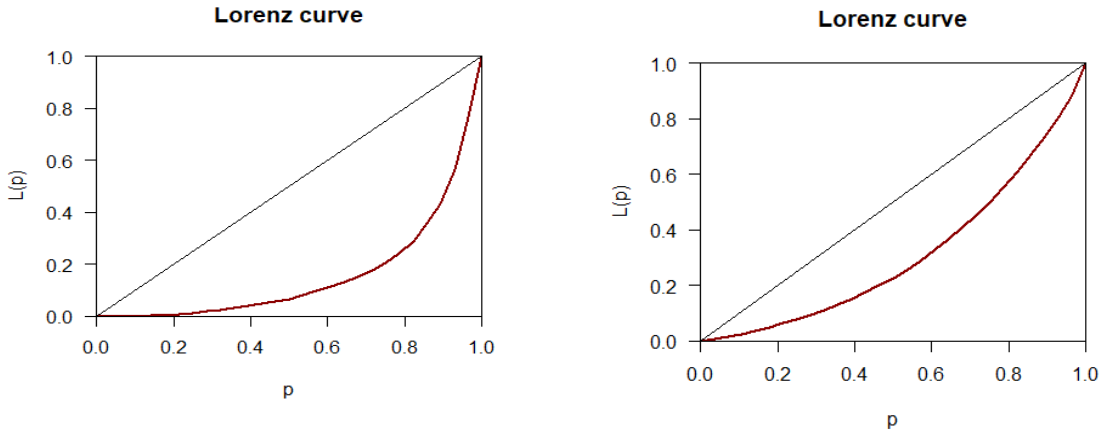
Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

In order to estimate the inequalities in financial subsidies allocated by the European Union in the framework of the Common Agricultural Policy financial supports it has used the Lorenz curve comparing as variables CAP total financial subsidies, Rural Development Programme subsidies, total financial subsidies disbursed in the first pillar of the CAP, direct payments, financial aids disbursed towards disadvantaged rural areas by the LFA payments and farmer net income.
Figure 10 has pointed out as the highest level of inequality assessed by the Lorenz curve has been found in the variables total financial subsidies allocated by the second pillar of the Common Agricultural Policy in the framework of the rural development programme and in LFA payments which is an important and fundamental part of the second pillar aimed at reducing the socio-economic marginalization. By contrast, the farm net income has pointed out the lower level of imbalances among all European countries part of the FADN dataset. Focusing the attention on the variables correlated to the first pillar of the Common Agricultural Policy results have underlined a modest level of imbalances.
Addressing the attention towards all 27 states belonging to the European Union and in specific in terms of total financial payments allocated by the first pillar and by the second pillar of the

Common Agricultural Policy, research findings have underlined as in Malta, Cyprus, Denmark, Spain, Romania and Bulgaria some imbalances even if in these two latter states it has been possible to find, and specifically in Romania, the highest level of imbalances in financial subsidies allocated in the first pillar investigated by the Lorenz curve (Figg. 11-12).

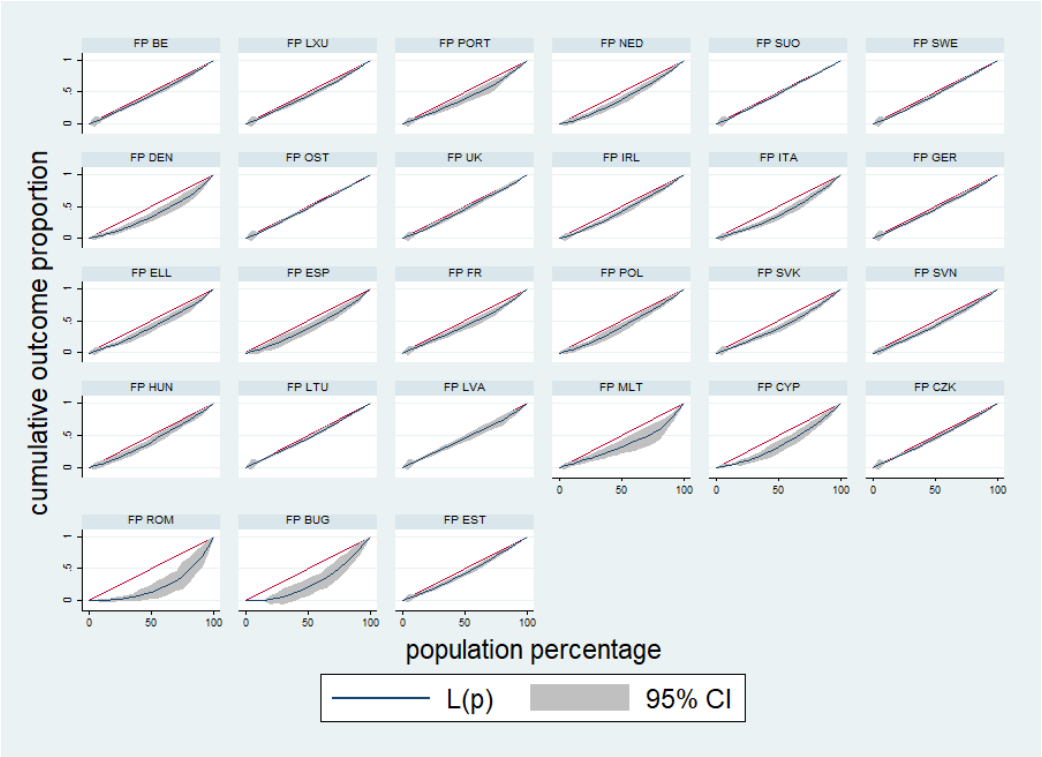
Fig. 10- Analysis in equalities in all farms part of the FADN dataset. Clockwise total financial subsidies allocated by the Common Agricultural Policy (CAP), Rural Development Plan (RDP) financial aids, payments allocated in the first pillar of the CAP, direct payments, Less Favoured Areas (LFA) payments and farm net income





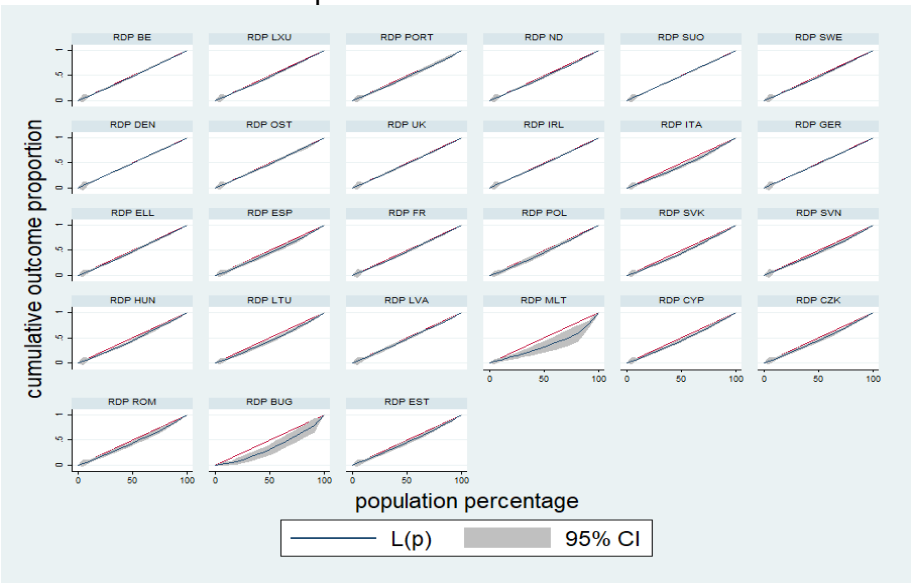
Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

Fig. 11- Analysis of inequalities using Lorenz curve of the variable first pillar subsidies in all European countries



Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

Fig. 12- Analysis in equalities of the variable RDP subsidies in all European countries in the framework of the second pillar



Source: elaboration on data https://ec.europa.eu/agriculture/rica/database/database_en.cfm

CONCLUSION

The effects and impacts of the Common Agricultural Policy have been investigating considering different quantitative approach which have corroborated a meaningful and noteworthy effects in different European countries of these subsidies. Findings have pointed out also as the imbalances among countries are typical of the new comer member states and the technical inefficiency is typical of many farms where modest is the land capital endowment.

Findings have corroborated the main role of financial subsidies allocated by the first pillar than the second one both towards the technical efficiency and also to the reduction of socio-economic marginalization throughout the second pillar of the CAP.

For the next future it is important to allocated the major financial resources to the second pillar supporting farmers in this transition phase which have had some impacts to the level of technical efficiency in farms. This is particularly true in new member states of the European Union and particularly in some of them with a poor level of land capital endowment and a state of leg behind in skills and technologies.

Drawing some final remarks, the role of the public administration should be addressed towards this transition phase; in fact, for new comer member states of the EU the transition phase and pre-accession stage can keep going in rural areas where are in activity small farms. Furthermore, it is fundamental to consider as the European Union is a kaleidoscopic of different agricultures and rural areas and an unique tool of planning such as the Rural Development Programme is a good and strictly severe task to condense the main priorities of rural development in specific and pilot initiatives of cohesive socio-economic growth.

In order to protect the rural space, it is fundamental not to drain financial resources to the second pillar considering also the consequences of the Brexit on the EU budget to the other European nations and in particular for some of them characterised by stayed behind rural areas at risk of a severe permanent emigration where the second pillar subsidies are pivotal for minimizing the marginalization of these disadvantaged rural areas

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TREATMENT OF BIODIVERSITY IN THE EUROPEAN CURRENT CONTEXT

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ABSTRACT

Biodiversity loss is the second environmental challenge of the third millennium after climate change. Although significant progresses were made in policy development, biodiversity loss is continuing. The necessity of quantitative assessment becomes more and more obvious for a harmonious performance of the science-policy interface. The paper addressed this topic by reviewing the most recent European progresses in indicator development. Thus, were discussed the milestones of nature conservation policy in Europe as background and the first set of indicators proposed within the SEBI initiative. This set was proposed considering CBD and EEA indicators and also data availability and will be further developed considering the policy relevance.

Nature conservation in the European Union (EU) is an important concern featured by continuity and improvement. Nevertheless, co-ordination and coherence needed for a European strategy were met only in the 1990`s.

The EU is recognized for its pioneering action in environmental protection. This pattern is also true for nature conservation. The first initiatives in this field were in legislation by the adoption of some directives and through the preparation of recommendations and guidance for Member States in assuming engagements within international agreements. After the Bern Convention (1979) the first specific directive was adopted for the protection of wild birds. Further, the European Commission made several recommendations for the Member States to adhere to the Paris Convention regarding the protection of natural and human heritage (1950) and to the Ramsar Convention.

After the Rio Convention it could be noticed the up taking of changes occurring in managerial paradigms since actions and strategies focus rather on ecosystems than on species and the integration of the social dimension is more and more intense. These changes are expressed in the European biodiversity strategy formulated as a „Common vision for Europe". The strategy is based on the following premises:

- *the preservation of Europe's natural heritage is a fundamental necessity for sustainable development in Europe;*
- *the preservation of Europe's natural heritage is a common responsibility of all European regions and countries and a task that could be fulfilled successfully only within a pan European framework;*
- *pan European cooperation will strengthen the efficiency of national actions made for the accomplishment of commitments assumed in Rio de Janeiro (1992).*

The strategy's goal is to prevent and lessen the action of factors that contribute to significant reduction and loss of biological diversity. This objective will be fulfilled through the creation of a pan European ecological network that allow the free circulation of species.

The Bern, Bonn, Ramsar, and Alpine conventions and the awards for natural sites in protected areas are the most important initiative that contributed to the emergence of the pan European network concept. This concept was transformed in reality in the Emerald network and then in the Natura 2000 network.

KEY WORDS: *biodiversity, indicators, ecosystem management, EU, SEBI*

BIODIVERSITY STRATEGY IN EUROPE

Biodiversity – the variety of life on the planet – is essential for our economy and for our well-being. But ever greater pressure on this most precious natural resource means that we now find ourselves at a turning point, where we risk losing many of the vital services we depend upon. Conserving biodiversity is not just about protecting species and habitats for their own sake. It is also about maintaining nature's capacity to deliver the goods and services that we all need, and whose loss comes at a high price.

In May 2011, the European Union adopted a strategy to halt biodiversity loss in the EU, restore ecosystems where possible, and step up efforts to avert global biodiversity loss. The strategy is in line with the commitments made by EU leaders in March 2010 and the international commitments adopted by 193 countries, including the EU and all its Member States, in the conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan, in 2010.

The biodiversity strategy is built around six measurable targets that focus on the main drivers of biodiversity loss. Each target is accompanied by a corresponding set of actions. The main challenges ahead include the full and efficient implementation of nature protection legislation – especially the effective management and restoration of areas of high biodiversity value in Natura 2000 – tackling invasive alien species and protecting ecosystem services. Biodiversity policies will also need to be integrated to sectoral policies and be taken into account in wider policy concerns. This is why increasing the contribution of fisheries, agricultural and forestry policies to protecting biodiversity will be key to its success.

Biodiversity loss is one of the most critical environmental threats alongside climate change and the two are inextricably linked. Without addressing the rapid loss of biodiversity, the world will struggle and likely fail to live up to the Paris Agreement or to achieve the UN Sustainable Development Goals (SDGs). And conversely without addressing climate change, actions to tackle the loss of biodiversity are likely to fail. Land use change and direct exploitation of organisms remain the main cause of biodiversity loss in natural and semi-natural habitats. Particular pressure is exerted by intensive agricultural practices, land abandonment, urban sprawl, grey infrastructure development and human activities at sea (such as fishing, shipping or tourism).

The main reasons why the EU is failing to halt biodiversity loss have been known for a long time and they remain the same:

· The insufficient implementation of existing nature, water and marine legislation

· The lack of ownership and the lack of mainstreaming with other sectors and policies: agriculture, fisheries, forestry and energy, which means that the main drivers of biodiversity loss are not sufficiently addressed

· The lack of resources (finance gap) and continuation of perverse subsidies

The underlying problem is the lack of political will to take nature loss seriously and to act accordingly and the opposition of those with vested interests in the status quo. The EU's commitment to "lead by example" made in 2010, is significantly undermined because it is not followed up with action on the ground in all EU Member States and this puts the EU's credibility at stake, both internationally and at home. In order to change this and to secure positive political will, more transparency in decision making is essential and the influence of vested interests needs to be challenged. Furthermore, an intense effort needs to be made to communicate to citizens and

politicians the often hidden values of nature and ecosystem services. The people's movement to avert the collapse of our life support system and an impoverished future for our children and grandchildren needs to be supported.

2020 marks a critical juncture for one of the defining global challenges of our time: the loss of biodiversity and ecosystem services, which underpin nearly all of the Sustainable Development Goals (SDGs). Transformative changes are needed to ensure biodiversity conservation and sustainable use, and the delivery of the ecosystem services upon which all life depends.

This report sets the economic and business case for urgent and ambitious action to halt and reverse global biodiversity loss. It presents a preliminary assessment of current biodiversity-related finance flows, and discusses the key data and indicator gaps that need to be addressed to underpin effective monitoring of both the pressures on biodiversity and the collective responses currently being implemented.

At European level these gaps and also the needs for an improved effectiveness in halting the loss of biodiversity revealed that the indicators used for biodiversity monitoring has to be streamlined. This resulted in the SEBI initiative that proposes a set of indicators departing from the framework used in Framework Convention on Biological Diversity (CBD).

EU BIODIVERSITY STRATEGY TO 2020

On 3 May 2011, the European Commission adopted a new strategy to halt the loss of biodiversity and improve the state of Europe's species, habitats, ecosystems and the services they provide over the next decade, while stepping up the EU's contribution to averting global biodiversity loss. It focuses on six major targets to address the main pressures on nature and ecosystem services in the EU and beyond, and lays down the policy foundations for EU-level action over the next ten years.

The strategy responds to two important political mandates adopted by the 27 European Heads of State in 2010:

- The first mandate stems from the conclusion that the current EU biodiversity policy was not achieving its targets, despite a number of major successes in some areas. The EU leaders therefore decided to adopt a new long-term vision and headline target to give impetus to redoubling efforts to conserve Europe's increasingly threatened biodiversity.
- The second mandate results from international commitments which the EU and all its Member States signed up to at the biodiversity summit in Nagoya, Japan in October 2010.

At that meeting, 193 Parties to the Convention on Biological Diversity adopted a series of landmark agreements. As a Party to the Convention, the EU is required to bring its own biodiversity policy into line with these international commitments.

The 2020 Biodiversity Strategy follows on from the 2006 EU Biodiversity Action Plan, learning lessons from its implementation and raising the level of ambition for 2020. Consequently, in addition to halting the loss of biodiversity, the new strategy also highlights, for the first time, the immense value of ecosystem services and the urgent need to maintain and restore these for the benefit of both nature and society. Although action to halt biodiversity loss requires money, the cost of inaction is expected to be even higher.

Biodiversity loss is in fact very costly for society, particularly for sectors that depend heavily on ecosystem services. Many farmers, for instance, depend on insect pollination for their harvests. Within the EU as a whole, the estimated economic value of insect pollination is b15 billion a year.

Flower-rich grasslands and large blue butterfly – both protected under the EU Habitats Directive 7 Introduction In 2010 the European Environment Agency (EEA), in collaboration with the European Commission, produced an EU Biodiversity Baseline which summarises the latest information on the status and trends of biodiversity and ecosystem components in Europe.

This baseline, which is based on a series of indicators, provides a reference point for measuring changes in the state of Europe's biodiversity over the next ten years.

By 2020, a set of biodiversity indicators should help determine whether there has been an overall improvement in the state of Europe's biodiversity, in particular whether the following has been achieved:

• A reduction in the number of species threatened with extinction. Currently almost 25% of European animal species face the risk of extinction.

• An increase in the number of species and habitat types protected under EU nature legislation that are in favourable conservation status. At present only 17% of assessed habitats and species are in a favourable conservation status.

• An improvement in the state of ecosystems and the services they provide. Most of Europe's ecosystems are now assessed to be degraded.

• A strengthening of Europe's green infrastructure. Today, nearly 30% of the EU-27 territory is considered to be highly to moderately fragmented.

• A decline in the over-exploitation of natural resources. Europeans currently consume more than twice what the EU's land and sea can deliver in terms of natural resources.

The EU strategy is built around six mutually supportive and inter-dependent targets which address the main drivers of biodiversity loss. They aim to reduce key pressures on nature and ecosystem services in the EU by stepping up efforts to fully implement existing EU nature legislation, anchoring biodiversity objectives into key sectoral policies, and closing important policy gaps. Global aspects are also addressed to ensure the EU contributes fully to implementing international biodiversity commitments.

Each target is accompanied by a set of focused, time-bound actions to ensure these ambitions are fully realised. The strategy is also underpinned by an EU 2010 baseline on the state of biodiversity and ecosystems in Europe. This baseline provides a reference point for monitoring and measuring progress over the next ten years and will help assess whether the EU is on track towards meeting the biodiversity targets for 2020.

Before its adoption, the Biodiversity Strategy underwent extensive consultation with key stakeholders, Member States and the general public. This not only ensured a transparent decision-making process, but also helped to build interest and support for the strategy amongst a wide range of different sectors of society. It is clear that biodiversity conservation cannot be achieved without the widespread engagement of society as a whole. The active involvement of stakeholders, key policy sectors and civil society will therefore be fundamental to the success of the new 2020 Biodiversity Strategy.

The primary focus was to provide scientific knowledge for the implementation of the EU 2020 Biodiversity Strategy, e.g. by pointing out possible weaknesses, opportunities and necessities, and by helping to find solutions and evidence-based actions. This exercise resulted in extensive list of 100 recommendations.

From these recommendations, six final and principal ones were distilled – one for each European target. They were deemed to be the most urgent and important requirements to enable Europe to meet its biodiversity targets for 2020 and beyond.

These six headline recommendations include:

- Target 1 (Conserving and restoring nature) Natura 2000 success depends primarily on ecosystem health, together with genetic health of its species and populations, rather than on present-day distribution patterns of specific species and habitats; in the end, ecosystem health and genetic population health are important for human well-being in general.
- Target 2 (Maintaining and enhancing ecosystems and their services) Mapping ecosystems and valuing their services is seen as important for improving the knowledge base about nature and social-ecological systems, but to avoid true merchandising of biodiversity, the use of monetary valuation and economic instruments should be limited to areas and situations where the monetary information is necessary for triggering conservation behaviour.
- Target 3 (Ensuring the sustainability of agriculture and forestry) Knowing which problems need standard approaches and which need targeted policy instruments is vital for the development and application of effective biodiversity conservation on managed lands. To advance sustainable agriculture and forestry, engaging the sector actors should be supplemented with standard best practices to solve well-understood general problems as well as innovative and diversified solutions to solve specific and geographically limited problems. Research should support also the monitoring and evaluation of these different types of problems and solutions.
- Target 4 (Ensuring the sustainability of fisheries) Science is the engine to generate adaptive management tools to optimise sustainable fisheries; rather than management based on a single species (among which the present-day minimum size approach for harvesting), ecosystem based fisheries management should be generally implemented.
- Target 5 (Addressing the problem of invasive alien species) Policy should aim at the broad impact of Invasive Alien Species and their interaction with native biodiversity, - health and food production rather than on the sole fact of being alien as criterion for combating details: the first short-term challenge is to develop legal and economic instruments, which are currently being worked on by the policy makers. The second challenge is to fill in the legal instruments with help of combining scientific efforts when it comes to integrating and linking different databases, web portals and other data collections.
- Target 6 (Addressing the global biodiversity crisis) The price of food, fibre and water should encompass both the production and maintenance cost of the ecosystem.

The classification developed through the analysis of strategic documents covers the recommendations of the EPBRS workshop that goes into more detailed priorities. The innovative ways of doing research identified during the EPBRS workshop bring some more suggestions on principles and enabling actions that will be critical for future research efforts. The 100 recommendations generated by the Alter-Net conference cover a wide scope and go beyond research recommendations. The main selected ones (one per target) can be linked to our classification and emphasize some more detailed needs for effectively implementing the EU biodiversity strategy.

"NATURE-BASED SOLUTIONS" CONCEPT

Along with the EU Biodiversity Strategy to 2020, the "nature-based solutions" concept has been emerging, calling for renewed needs of knowledge and actions. As a consequence BiodivERsA partners considered this topic as a major emerging issue for the biodiversity research community, and organised a strategic foresight workshop in June 2014, in particular to identify research needs relevant to Nature-Based Solutions.

The “nature-based solutions” concept refers to the use of nature in tackling challenges such as climate change, food security, water resources, disaster risk management, etc. The purpose of the “nature-based solutions” concept is to encompass a wider definition of how to conserve and use biodiversity in a sustainable manner. By going beyond the threshold of traditional biodiversity conservation principles, this concept intends to additionally integrate societal factors such as poverty alleviation, socio-economic development and efficient governance principles.

The International Union for Conservation of Nature (IUCN) is currently developing guidance on what type of interventions could/ should/ should not be considered as a “naturebased solution” (NBS). Other groups are also discussing the definition of the concept of NBS such as the Horizon 2020 Advisory Group (AG) for Societal Challenge 5 ‘Climate Action, Environment, Resource Efficiency and Raw Materials’. Examples of nature-based solutions are provided below:

- Naturally connected floodplains and riparian ecosystems can provide flood protection for millions of people who are likely to experience increased flood risk
- Forest protection and reforestation can provide clean water, reduce flood risk and support carbon sequestration.
- Deep-rooted, nitrogen-fixing plants can naturally replenish soil nutrients in systems helping to maintain access to food supplies. Plants can help filter sediments and nutrients keeping our waters clean and available for human consumption while enhancing carbon sinks.
- Mangrove forests provide protection services from coastal erosion and protect human lives in the face of severe storms while providing nurseries for fishes which can feed coastal populations of people.
- Well-managed and conserved grasslands can provide forage for livestock while storing carbon in above- and below-ground biomass.

Yet, more research and adequate implementation strategies are needed to investigate naturebased solutions, and to further explore how societies can avoid degrading their natural environment and the wealth of valuable benefits it provides. As a consequence, the Horizon2020 program of the European Commission (EC) is expected to tackle nature-based solutions in its 2016-2017 phase. Consultations are thus being set-up at a pan-European scale under the umbrella of the EC.

As the concept of nature-based solutions is rising on the research policy agenda, BiodivERsA organized a horizon scanning workshop, providing an opportunity for BiodivERsA project scientists, and programmers and funders of research members of BiodivERsA (including several Ministries) to:

- Learn more about nature-based solutions through discussions with policy makers and a range of stakeholders (NGOs, businesses, practitioners, etc.)
- Assess to what extend nature-based solutions have already been addressed in BiodivERsA-funded research projects
- Discuss how these nature-based solutions could be further investigated in the field of interest of participants. Such an exercise could produce lists of potential research priorities that could be considered by BiodivERsA’s strategic agenda.

It was expected that the workshop would help identifying potential research priorities that could be considered by BiodivERsA’s strategic agenda in the future. Here, we report on the main results in terms of (i) framing the emerging concept of nature-based solutions and (ii) research priorities identified.

In these difficult economic times there will also be a need to examine ways of diversifying funding sources from public and private sources and of developing innovative approaches to

funding, such as the use of Payments for Ecosystem Services (PES) which reward those who provide public ecosystem goods and services. The potential of biodiversity offsets to ensure no net loss of biodiversity and ecosystem services will also be explored.

PROTECTING EUROPE'S NATURE

All experts agree that the EU has again failed to deliver on its Biodiversity Strategy's 2020 targets, yet the mid-term review in 2016 demonstrated progress in some areas European Commission: Protecting Europe's nature: more ambition needed to halt biodiversity loss by 2020. One of these is the implementation of the EU nature directives.

A new study by IEEP and partners for the European Commission identifies the main success factors underpinning conservation successes for habitats and species protected under the two directives New study: Drivers of conservation success in the EU. The study draws on Member State monitoring and reporting data as well as 53 in-depth case studies across the EU.

The findings confirm the importance of protected areas as the cornerstones of conservation strategies; by securing key nature hotspots and by acting as a catalyst and focus for concerted action. Most of the successful conservation cases were made possible by targeted research supporting adaptive management. The cases also show how the genuine and early participation of key stakeholders is crucial. The report's findings bear testimony to the significant efforts made by a wide range of stakeholders to make EU nature policy a success, and provide a helpful resource to further enhance its implementation.

Despite these conservation successes, the IPBES and EU's own assessments point to a significant gap in policy and political ambition. The end of the EU's current biodiversity strategy and other EU environmental commitments next year begs the question: how can the EU step up and bring the biodiversity-dependent SDGs for 2030 back on target?

To help answer this question IEEP and GLOBE EU have built a new evidence-based, non-partisan platform to identify science-policy solutions for a more sustainable Europe. The platform, called Think 2030, now has 100 leading policy experts from European think tanks, civil society, the private sector and local authorities who pull resources together to inform EU policy delivery on the SDGs to 2030. In 2018, the Think 2030 platform developed a series of policy papers.

One paper synthesizes the key lessons learnt from implementing the EU Biodiversity Strategy to 2020 to inform Europe's post-2020 biodiversity policy framework Think 2030 policy paper: Valuing biodiversity and reversing its decline by 2030. The central argument of the Think 2030 paper is the need for a broader and deeper shared societal recognition of the value of biodiversity to our development and well-being. This need is also reflected in the theme of this year's international biodiversity day: '*Our Biodiversity, Our Food, Our Health*'. The theme is particularly fitting in an EU-context, where farmland biodiversity indicators keep on falling EEA Common birds and –butterfly indices and unsustainable food production and -consumption choices continue to represent a significant share of the EU's ecological footprint for example through imported deforestation. The incoming European Parliament and -Commission will be immediately hard-pressed to act on policies critical for biodiversity, with pending decisions on the EU's Common Agricultural Policy, a strategy on Stepping up EU Action against Deforestation and Forest Degradation, a review of the Water Framework Directive and of course the new EU policy framework for biodiversity beyond 2020.

As IEEP's recent study on conservation success drivers shows, there is, luckily, a wealth of positive experience that EU decision makers can build on. Each positive case study in the report was made possible by often opposing interests coming together around a common passion or concern, and jointly finding the means to turn the tide. Therefore, today's celebration should cherish the wonders of life as well as the continued effort made by a diversity of stakeholders to better value and protect them.

Global biodiversity loss and the international context Biodiversity loss is one of the greatest risks of the 21st century. It undermines human health and well-being, societal resilience and progress towards the SDGs. It places severe costs on our economies and makes addressing other global challenges, such as climate change, much more difficult. The planet is facing its sixth mass extinction, with the current rate of species extinction estimated to be as high as 1000 times the background (pre-human) rate.

In addition, widespread and rapid population declines are affecting even common species that are fundamental to ecological processes: since 1970, the world has lost 60% of its global vertebrate population, and more than 40% of insect species are declining rapidly. Humans have transformed the majority of the world's ecosystems, destroying, degrading and fragmenting terrestrial, marine and other aquatic habitats, and undermining the services they provide.

Natural forests declined by 6.5 million hectares per year from 2010 to 2015 (an area greater than the United Kingdom in 5 years), mangroves declined by 20% from 1980 to 2005, and natural wetlands declined by 35% between 1970 and 2015. Business-as-usual projections are bleak: coral reefs, for example, are projected to decline by a further 70-90% at a global average warming of 1.5o Celsius above pre-industrial levels, or by more than 99% if warming reaches 2o Celsius.

Ecosystems are moving closer to critical thresholds and tipping points which, if crossed, will result in persistent and irreversible (or very costly to reverse) changes to ecosystem structure, function and service provision, with the potential for profoundly negative environmental, economic and social consequences.

Key pressures on terrestrial, marine and other aquatic biodiversity include habitat loss and fragmentation (particularly from agricultural expansion and intensification), over-exploitation of natural resources (e.g. fish), pollution, invasive alien species and climate change. The root cause of biodiversity is the growing demand for food, fuel, water and land, combined with well-documented inefficiencies and resource misallocation in global production and consumption systems. The G7 Environment Ministerial Meeting in May 2019 takes place at a crucial time.

Next year marks the end of the 2011-2020 Strategic Plan for Biodiversity (and, therefore, nearly half of the targets under SDGs 14 and 15). Governments will meet in China to agree on a post-2020 global biodiversity framework. The new framework will influence national goals and policies, and thus our collective ability to stop biodiversity loss and deliver on the SDGs.

Globally, up to 6 billion hectares of land are degraded (i.e. 20 times the size of France). Ecosystem restoration can bring species back from the brink of extinction, reverse the trends in ecosystem decline and help overcome major societal challenges, such as climate change, disaster risk and achieving inclusive economic growth. Restoration can deliver multiple benefits. Restored mangroves, for example, can protect society from storms, hurricanes and coastal erosion, sequester carbon, provide a nursery ground for fish, offer a source of fuel and support ecotourism.

Recognizing the multiple benefits of ecosystem restoration, governments and businesses have committed to this goal through several high-level global initiatives (e.g. the Bonn Challenge) and international agreements (e.g. SDG 15 and Land Degradation Neutrality under the United Nations Convention to Combat Desertification).

The benefits of restoration can far exceed the costs, particularly for inland and coastal wetlands, grasslands and forests. For example, achieving the Bonn Challenge target of restoring 46% of the world's degraded forests could provide USD 7-30 in benefits for every dollar spent. The net benefits depend on the objectives, degree of degradation, and ecosystem type and location, as well as the opportunity costs.

In general, preventing the degradation and loss of an ecosystem is more cost-effective than restoring it. Restoration can also offer new economic and business opportunities. In the United States, for example, restoration work provides direct employment to an estimated 126,000 workers and generates USD 9.5 billion annually in economic output.

Restoration action at a landscape scale can help maximise synergies and manage potential trade-offs between ecosystem services, as well as balance competing demands for land or ocean resources. It is important, therefore, to integrate restoration into broader land-use and marine spatial planning. Large-scale restoration should be an inclusive process, requiring the participation of a range of stakeholders, such as local and indigenous communities, local and national governments, and the private sector.

CONCLUSIONS

Basically, all research recommendations relate to the same key challenge that is specifically focusing on supporting a socio-economic paradigm shift to ensure human survival by preserving the living environment we depend upon. The current socio-economic paradigm aiming to increase the pressure on this living environment to supply even more marketable goods and services without taking into consideration long-term consequences and planetary boundaries must be changed to a truly sustainable and equitable economy and management of natural resources within the limits of the planet's ecosystems resilience.

Research and specifically research funding agencies have a key role to play to support this transition through targeted research calls but also through support to building the capacity of the research community specifically on trans- and interdisciplinarity, as a major bottleneck is the joint, integrative work of different actors and sectors in a transdisciplinary way. Developing research needs in such a context is challenging as it requires to develop a very integrative view, accounting not only for the environmental aspects but also the social and economic ones.

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EVOLUTION OF COMPETITIVENESS IN AGRICULTURAL INDUSTRIES

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ABSTRACT

EU integration offers opportunities for all member states in terms of capitalization of comparative advantages on the free movement of capital, goods and people. These are positive effects from free market running, as each state may implement the strength it possesses in the field where its comparative advantages outmatch the strengths of others. However, the free and big European market creates competition between member states and the companies running in this market, which is very often painful and threatening for the inefficient and weaker entities. The competitiveness defined in this analysis is envisaged as ability of particular agricultural industry to maintain and expand its local and international market share and to maintain and to rise up the added value of production nationally and globally. The goal of the paper is to evaluate the competitiveness in key industries in Bulgarian crop agriculture, exposing the evolution and causes behind the observed changes. The main analytical tool is the quantitative measuring of the index of competitiveness taking into account the local and international production and consumption of agricultural products per capita and the prices in the international trade. This methodological approach allows to compare different states and to compare the competitiveness of the particular states in different markets. The results from the analysis show an improvement in the value component of competitiveness, which means that the Bulgarian price is getting higher relative to the world average price levels. This means that the same amount of output already generates more revenue and, consequently, greater added value. In terms of production component, the competitiveness varies largely depending on the industry, as a strong competitiveness is found in industries, which are very specific and not vastly distributed in global agriculture.

Keywords: agricultural industries, competitiveness, output, added value, consumption, international trade, prices

INTRODUCTION

Competitiveness is important not only for the economic development of Bulgarian agriculture, but without its achievement it is difficult to attain the high environmental and social standards that are priorities and goals of the contemporary state development. The competitiveness is widespread notion, which has different connotations and meanings depending on prospective points of view. According to *Voinescu and Moisoiu (2015)* "theoretical origins of the concept of competitiveness can be traced in the economics of foreign trade and its role in national and international economic welfare". *The European Commission (2004)* envisions that "strengthening regional competitiveness throughout the Union and helping people fulfill their capabilities will

boost the growth potential of the EU economy". *Koteva and Bachev (2010)* outline the competitiveness on micro level and posit "to be a farm competitive is to be efficient, adaptable and sustainable". The efficiency is a major factor to produce in lucrative price, which nowadays is linked with innovation capabilities and with handling risks, related to internal and external environment. The competitiveness in agriculture is conflated with sustainability through environmental and social issues as to achieve higher competitiveness should be done by meeting environmental and social needs. There are a number of opportunities to combine these goals, one of which is through introduction and orientation of agriculture to new technologies and innovations that lead to more efficient, highly productive, more manageable and resource-efficient solutions.

The competitiveness per se could be viewed as an outcome in terms of market share and earned value resulted from efficiency, innovation capabilities, risk handling, adaptability and other factors determining it. Based on this definition, in order to quantify the performance, a competitiveness index has been compiled at the sector level. In order to have comparability between products, the methodology is applied to comparable and measurable raw products and goods. The goal of the paper is to evaluate competitiveness through an index itself, expressed per capita, because competitiveness has not only an absolute dimension but also a relative one, which takes into account on the basis of existing resources and potential what results are achieved. Production and consumption are weighted by the number of population, which allows the creation of a single base, and the comparison of results on different grounds.

METHODOLOGY

In an OECD study of approaches to measuring competitiveness and efficiency in agricultural production, *Lattrufe, L. (2010)* notes that in economic theory there is no generally accepted definition of competitiveness, and that it can be defined as "the ability to be successful when you face competition". In the present study, the market performance is perceived as based on the Canadian Competitiveness Group's definition: "The ability to sustainably earn and maintain market share". It is assumed by *Martinet. al. (1991)* as a theoretical framework for measuring the competitiveness of an individual country or sector and can be used for performance indication. It sets out two concepts - to change market share and generate profit in order to achieve sustainable development over time. Competitiveness, as a static aspect, is determined by the ability of dairy cattle breeding in Bulgaria to maintain and expand its local and national market share, to maintain and increase the added value of its products nationally and globally.

Based on this definition, a competitiveness index has been compiled to quantify the performance of individual sectors. The composite index of competitiveness shows in terms of production and value, where the Bulgarian crop production is located, by the selected products worldwide (*Ivanov, 2019, Ivanov and Stoychev, 2018, Ivanov, 2018*). The closer the value is to 1, the higher the competitiveness of the sector is estimated per person in Bulgaria compared with world scale and vice versa. The obtained quantitative assessments of competitiveness can be

classified into 5 categories, corresponding to the qualitative expression of competitiveness, which mean:

0 – 0,25 Index score – Poor competitiveness

0,21 – 0,45 Index score – Moderate competitiveness

0,46 – 0,55 Index score – Medium competitiveness

0,56 – 0,75 Index score – High competitiveness

0,76 – 1 Index score – Perfect competitiveness

Production and consumption are weighted by the number of population, which normalizes the outcomes, and allows comparing sectors in national levels taking into account resource disparities and population differences. In pursuit of operational, it is envisaged the production is equal to consumption since the exact size of world stocks of crop products is hardly estimated. The production component includes the gross production of covered crops divided to domestic and world consumption and corrected by domestic export in case the country is net exported. This component has two options, which depend on whether the level of self-satisfaction of the country is provided or the country is not net exporter. In case the country is self-sufficient for the specific product, then the formula for calculating the PIC_{DC}, представя:

$$PIC_{DC} = \frac{MP_{BG}}{MC_{BG}+MC_{WR}+ME_{BG}}, \quad (1), \text{ where}$$

MP_{BG} is Bulgarian production of certain crop expressed in volumes, MC_{BG} is consumption of that product in Bulgaria per capita, including production + import – export, while MC_{WR} is world consumption per capita, assuming global production is equal to consumption with stocks set aside. Another variable in denominator is ME_{BG} – standing for export added in case the country in particular sector is net exported.

The exported volumes are included in the denominator in case production is higher than consumption otherwise the index of production component can overshoot 1 inasmuch as the domestic and world consumption are estimated per capita while their amounts are starkly different and to achieve an equation balance, the export per capita must be added *(Ivanov, 2019)*. To precise completely the purpose of the equation, the world production and consumption respectively are adjusted by domestic production and population subtracting the local ones from world variables and equation (1) is balanced. Thus the property of production component of competitiveness PIC_{DC} is set to be in the range 0 to 1 (*Ivanov, 2019*).

In the second way, PIC_{DC} is equalized by:

$$PIC_{DC} = \frac{MP_{BG}}{MC_{BG}+MC_{WR}}, \quad (2) \text{ and}$$

the denominator of the formula is without ME_{BG} – the crop export from Bulgaria because in all cases when consumption surpasses the production, the denominator will be higher than nominator and production component will be in the range 0 to 1. In those cases, the world production and

population are corrected by domestic counterpart variables to be sure if the country is single consumer of certain product it is not due to re-export and re-import. In this case, the estimation of production component can be done by equation (2) or by modifying equation (1), where the ME_{BG} represents:

$$ME_{BG} = MP_{BG} - MC_{BG}\,, \qquad (3)$$

How formulas (1) and (2) work can be demonstrated with following example of comparing competitiveness of two countries, which have equal population and equal production per capita, where the first one exports all production to second one. If productions are assumed to 1 kg per capita then the production index component is estimated by formula (1) with an production index of 0,5, while the PIC_{DC} of second country is calculated by formula (2) to 0,33. If those countries do not trade each other and production remains locally, both PIC_{DC} will be at 0,5. Theoretically, the competitiveness index takes score 0 every time when the domestic production is zero. The index score can reach whenever the national production is solely in the world. When the index is estimated to 0,5, it implies the productions and consumptions locally and internationally are equal. If Bulgarian crop production equalizes the world production, the PIC_{DC} will be 0,5 referring to medium level of competitiveness.

Other component of competitiveness is the value one, which shows the valorization national crop sectors have in the world market. The value index component is important part of the competitiveness because it sheds light on the price certain production develops and grows. Although the production index component indicates the competitiveness in terms of production to be less or over 0,5, this result can be attained by selling volumes at either greater or lowered price, to have a smaller market share but to produce and sell product at higher price and on more expensive market segment. The value index component VIC_{DC} represents the changes of gross value of Bulgarian crop output compared to world value output, expressed by equation:

$$VIC_{DC} = \frac{MV_{BG}}{MV_{BG} + MV_{WR}} \qquad (4), \text{ where}$$

MV_{BG} - is the gross value of Bulgarian crop output by each of studied sectors estimated per capita yielded by multiplying volumes by value price. Besides, MV_{WR} is the gross value of world crop production by certain industry obtained by yielding crop quantity with price value. The price value for MV_{BG} and MV_{WR} are taken from trade prices of exports in order to eliminate national currency volatility. In formula (4) as much bigger the difference between gross value of domestic production and world counterpart value so taller than 0,5 is meaning of VIC_{DC}. The estimation is done using the value data from International Trade Center and the value index component can indicate for added value where as higher is the gross value output as higher is the assumed added value for certain crop.

Te overall index of competitiveness is estimated by equation (5). The overall index represents the contribution of production index component and value index component, which have equal share in IC_{DC}. The overall index reveals the market share of crop production and the

value gained by the production, which represent the important dimensions of competitiveness envisaged as an outcome and evaluation.

$$IC_{DC} = \frac{PIC_{DC} + VIC_{DC}}{2} \quad (5)$$

The IC_{DC} can receive score from 0 to 1 reflecting the scores from PIC_{DC} and VIC_{DC}. This methodology is applied to crop industries from Bulgarian agriculture – grain, vegetables and fruits. The selected crops from those industries are picked regarding wheat (cereal), tomato, cucumber and bell pepper (vegetables) and apple, pear and quince (fruits). The data to calculate competitiveness indexes of covered crops is taken from official national sources and ITC, as the period ranged in the study is 2007-2017. The competitiveness index allows making analysis and conclusions not only for the crop performance in Bulgaria compared to the world but also to research the dynamic and trends of index through the years.

RESULTS

Increasing the competitiveness of agriculture must be based on improving production efficiency, increasing productivity, expanding innovation and knowledge intensity in production, improving marketing and market organization of supply, increasing market orientation, finding and expanding access to new markets (*IAE, 2020*). Strengthening competitiveness must lead to an increase in the added value of agriculture, which will create greater sustainability and increase the industry's ability to meet environmental and social challenges and commitments. Deriving the need to increase value added follows one of the major weaknesses of Bulgarian agriculture related to the less efficient use of production resources (land and livestock), which leads to lower profitability, return and profitability. This need is connected and has its solution with the need for better balance between the sectors of Bulgarian agriculture.

To improve balance among industries, efficiency and productivity must be increased in sensitive sectors that suffer from lower profitability and returns. It is investment, material and economic stabilization of sensitive sectors and those that can lead to higher added value in the industry that are key. Direct payments can be more strongly linked to the search for results in terms of added value and competitiveness. Income support for farmers should go hand in hand with increasing competitiveness and added value, with a focus on productivity, modernization and innovation.

The overall index of competitiveness in grain production shows a high result, which gives grounds to summarize that grain production is not only an important and strategic sector in Bulgarian agriculture, but it has a very good position in the global market and a strong, defining and successful role of the international scene. Although the country accounts for about 1% of world grain production, this does not prevent it from being considered competitive in this market. It is even more important to note, despite the fact that the country is a price taker, Bulgarian grain producers manage to get a higher price of their grain and to be better positioned than the world

average. The stable positions shown over the years show that the industry is developing sustainably and is well adapted to modern global market conditions.

There are several reasons for the very high assessment of competitiveness in grain production, referring to internal and external factors. The internal factors are related to the significant improvement in the used agrotechnics, the tangible improvement and modernization of the equipment and technologies for production in the farms, the favorable structure of the farms, the presence of traditions and experience in this production. External factors contributing to the results achieved are the support provided by European funds, the appropriate soil and climatic conditions for this production and the specifics of trade and the goods produced. The grain market is the largest global market for agricultural goods and products in terms of both quantity and value. About 21-22% of grain production is subject to international trade.

Fig. 1. Index of competitiveness in cereal industry

Source: MAFF and International Trade Center, CAPA.

The competitiveness of grain production is largely determined by robust modernization and improved technology, and due to the importance of the industry as a provider of food and feeding, the development and supply of new technologies and production methods is very high. The economic structure of these producers in Bulgaria and the favorable environment as a member of the EU, as well as the access to European funding allowed for the entry not only of new machines and seeds, but also for the introduction of innovative production methods. The concentration of economic and production resources and the increasing global competition make the grain farms suitable and able to become a key segment for increasing competitiveness based on the development of innovation and precision agriculture.

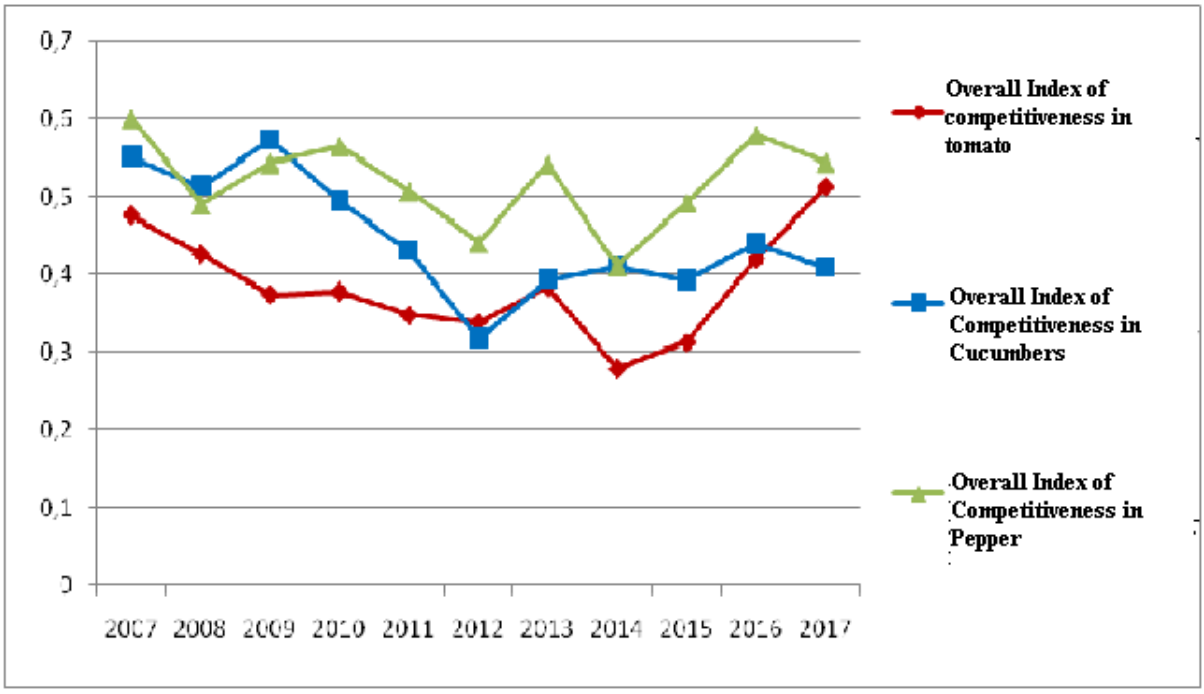
The main reason for studying the competitiveness in vegetable production on the basis of a reference crop is that the group of vegetables includes many and diverse plants, which makes it very difficult to combine them under some common equivalent to allow their comparison. The study itself shows that on average for the period 2007-2017 in terms of production, Bulgarian vegetable production has experienced ambiguous development, associated with a clear decline in the first years and a gradual recovery in the middle of the period.

In the case of tomatoes and cucumbers, it is observed that in the production component there is an index of 0,46 for tomatoes and 0,37 in cucumbers, while in the value component there is a jump to 0,52 for tomatoes and up to 0,53 for cucumbers. Interestingly, the country has high levels of self-sufficiency in cucumbers, higher than in tomatoes and other vegetables, but world production exceeds domestic production per capita, which explains the lower levels of the production component. The high levels of the value component, which takes into account gross revenues from tomato production, are due to the significant increase in traded prices relative to foreign trade world prices. This shows that the producers of tomatoes and cucumbers manage to sell their products at higher prices than the average European prices and hence the added value of production to be higher. Another specificity of the value component of competitiveness is the large volume of movement, which is about 25% year on year, but in some years there are much larger amplitudes.

The overall competitiveness index for tomatoes in 2017 reached 0,51, while for cucumbers it stabilized slightly to 0,41, after reaching the lowest levels for this product in 2012 of 0,32, which means that the averages comparable to the world levels in this production are reached. This gives reason to say that Bulgaria is at levels of competitiveness in tomatoes, comparable to the world average and market positions are improving and are better than at the beginning of the period. This is mainly due to the increase in tomato production after 2016, as well as export prices compared to world prices.

In the case of cucumbers, the trend is rather negative, with much better values of the overall competitiveness index being reported at the beginning of the period, which fell sharply between 2010 and 2012 due to a decrease in production and an increase in imports and consumption. The overall competitiveness index for cucumbers for the whole period is about 0,45, while for tomatoes it is 0,39, which shows that on average for the period in the production of cucumbers there are higher indicators than for tomatoes, but the competitiveness of this product ends at -lower positions than tomatoes. Pepper has the highest index of competitiveness, which for the whole period is measured at levels of 0,52. For the period there is another decline, as domestic production gives way, against the background of growing world production and imports in the country.

Fig. 2. Overall index of competitiveness in vegetable-growing



Source: MAFF and International Trade Center, CAPA.

The assessment of competitiveness in fruit growing is made by calculating the competitiveness index of the following types of fruits: apples, pears and quinces. They are accepted as a reference group for fruits. They are among the most important not only in terms of production but also the consumption of fruit in the country. Apples, excluding fruit vegetables such as watermelons and melons, are the most consumed fruit in the country. Apples are among the most common fruit grown worldwide. The total production in Bulgaria of main fruits for the period 2007-2017 increased more than 2 times, which gives reason for optimism. World production is growing at a slower pace than Bulgaria, which contributes to the positive trend in the production component of competitiveness.

The selected fruit reference group is divided into apples, pears and quinces, collected and tested for competitiveness as a common group, grapes, plums and cherries, as individual fruits and peaches, apricots and strawberries. For apples, pears and quinces, the production component of competitiveness has increased over the years, reaching levels of around 0,3 in the period between 2014-2016. For the whole period the production component of competitiveness is about 0,23, which indicates deteriorating production conditions in the country compared to world agriculture. Relatively, the 3 varieties of fruits have homogeneous indicators, and although the production of these fruits in the country is increasing, it remains at about half of world production per capita, which predetermines the low levels of the production component.

Regarding the value component of apples, pears and quinces for the competitiveness index, it is in the range of about 0,21, which shows a lower result of this component compared to its production half. What makes the difference between the production and the value component of

competitiveness is that the value component does not show a clear upward trend, as it is noted with the production component. This means that in Bulgaria, despite the fact that there is an increase in the production of the whole group, most of the increase is characterized by a lower price and gives less value in the formation of gross output and value added.

Fig.3. Index of competitiveness in fruit growing industry

Source: MAFF and International Trade Center, CAPA

The overall competitiveness index for apples, pears and quinces is the arithmetic mean between the two components and is equal to 0,22. This gives grounds to say that Bulgaria has unsatisfactory, low competitiveness in these types of fruits. The country not only produces much less than is produced in the world per capita and is highly dependent on imports, but is also below average levels of value added and remains highly dependent on both production and output. from price fluctuations in world markets. The reasons for the low levels of competitiveness of apples, pears and quinces are the problems in production and marketing, as the density of areas with such fruits per unit area the country ranks below the world average. The reason is the high competition on the European and world market with such fruits, which makes it difficult for local producers to offer enough products at good prices.

CONCLUSIONS

To increase the competitiveness of agriculture, it is necessary to pay attention to the vertical integration along the value chain, cooperation and innovation. Direct payments must remain a key support tool, strengthening their role in income protection, as well as increasing the effects of their distribution. Funds from direct payments must lead to increased efficiency and productivity in agriculture, which is a cue to achieving a robust competitiveness. In view of this, support for competitiveness in agriculture must lead to an increase in added value, and the instruments to

achieve this goal must be expressed in tangible and measurable results. In addition to private projects, investment support can be extended to collective projects and joint initiatives, which will strengthen the integration along the value chain. Innovation needs to go much further in creating added value and strengthening competitiveness. Through the successful introduction of new technologies for production improvement or optimizing work processes, preconditions must be created for more active and effective tripartite interaction between the state, agribusiness, academic centres and innovators.

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DIVERSIFICATION OF THE ECONOMIC ACTIVITIES – A BETTER FUTURE FOR BULGARIAN RURAL AREAS

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ABSTRACT

The economic development of rural areas is one of the priority of the Strategic plan for Agriculture and rural areas development (2021-2027). The CAP will continue to play a significant role in local development through promoting employment, growth and social inclusion. The CAP is focused on income support, decrease depopulation and improve standards of living. Regional economic, social disparities remain in Bulgaria. Some rural areas face depopulation, ageing population, risk of poverty and economic decline. Meanwhile, the potential of many rural areas remain closely linked to the presence of a competitive and dynamic economic sector (e.g. manufactures, local industries, services, tourism), which ensures working places income for the rural inhabitants.

Micro and small enterprises are the focus of the paper because they are the key beneficiaries of rural development program (2014-2020).

The methodology of research includes system, systematic description and correlation analysis. The authors estimate the level of diversification of economic activities and its effects on the population income and well-being. Our findings show that the economic diversification has a positive impact on the financial performance of family business in rural municipalities.

INTRODUCTION

The diversification of the economy, both within agriculture and into non-agricultural activities, has significant potential to reduce social, economic diversity across the regions in Bulgaria. Economic development of the rural areas is a center of Strategic plan (2012-2027), creating better jobs and the growth of non-farm activities in the rural economy.

The concept of diversification of the local economy aims is to develop non – agricultural activities. Our understanding for diversification of rural areas is developing 'traditional' economic activities and create new ones. The potential for the diversification of activities in rural areas is based on traditional manufacture, local crafts, trade and service provision.

The micro enterprises are the main factor for pushing the competition and manufacturing and hence for the overall economic development of a country.

The aim of the research is to determine the diversification level of the activities of rural households in Bulgaria. The level of diversification of economic activities is estimated by macro and micro economic indicators that effect on the population income and well-being. The indicators that are examined refers to income, economic performance of rural municipalities at aggregate level.

Methodology of research is based on systematic and correlation analysis. The systematic analysis is used to compare the internal differences across municipalities. Synthesis analysis allows to highlight the current problems of rural development and the economic profiles of rural municipalities.

1. Macroeconomic Stability and economic development in rural communities

The region typology enables the consistent identification of comparable rural areas and intergradations with urban land in the Bulgarian territory.
Eurostat developed an urban-rural typology for NUTS 3 regions. The urban-rural typology is based on statistics for NUTS level 3 regions: these are classified according to the density of population in 1 km2 grid cells, through the share of the population living in urban clusters and rural grid cells. There are differences in terms of population distributions across the regions in Bulgaria. Last year the trend is concentration of the population in mostly urban areas. The population density is used for identifying the degree of urbanization of cities. According to the European classification the number of population in 12% to total population and population density is 37. 4, p./ sq. km. (Table 1)

Table 1 Basic Rural Data for Bulgaria, 2018

Rural type	**Area**		**Population**		**Population density**
	sq. km	share	number	share	p./ sq. km
Bulgaria (European classification - NUTS 3 level)					
intermediate	84654.4	76.7	4766622	68.1	56.3
mostly rural	24387.9	22.1	905297	12.9	37.1
mostly urban	1329.4	1.2	1328120	19.0	999
Total Bulgaria	**110371.7**	**100.0**	**7000039**	**100.0**	**63.9**
Rural region (National definition - LAU 1 level)					
intermediate	68882.7	77.1	2040957	77.3	29.6
mostly rural	20438.9	22.9	600117	22.7	29.4
Total Rural region	**89321.6**	**(80.9)**	**2641074**	**(37.7)**	**29.6**

Source: own calculations, Eurostat and NSI, 2018[1]

[1] The Urban-Rural Typology (Eurostat 2017) presents a new European Union (EU) typology of 'predominantly rural', 'intermediate' or 'predominantly urban' regions based on a variation of the OECD methodology. The new typology proposes a two-step approach to identify population in urban areas as:
1. A population density threshold (300 inhabitants per km²) applied to grid cells of 1 km²;
2. A minimum size threshold (5 000 inhabitants) applied to grouped grid cells above the density threshold.

The national definition for mostly rural areas cover 22.7% of the population and population density is 29.4 p./ sq. km.

A problem in rural areas is the deterioration of the age structure, the outflow of young people, the decline of the population and the lack of human potential. In many of the smaller settlements predominantly older people than 65 years, and in urban areas (mainly in the Sofia-city district), the human potential is much higher than the rural areas.

Deteriorating age structure and increase share of the elderly population will lead to serious consequences for the economy, the labor market, social systems and risk of poverty as well as.

A region's growth potential depends a lot on where it is located and how dense its population is. The settlements close to urban cities and agglomeration could benefit by opportunity for jobs and stable income.

The increase of the population over working age is a problem, particularly in rural areas.

It is necessary to create conditions for employment, starting a business, for the development of economic activities outside the traditional sector - agriculture.

Accelerated economic development in recent years has changed the labor market and unemployment has reached its lowest level in ten years.

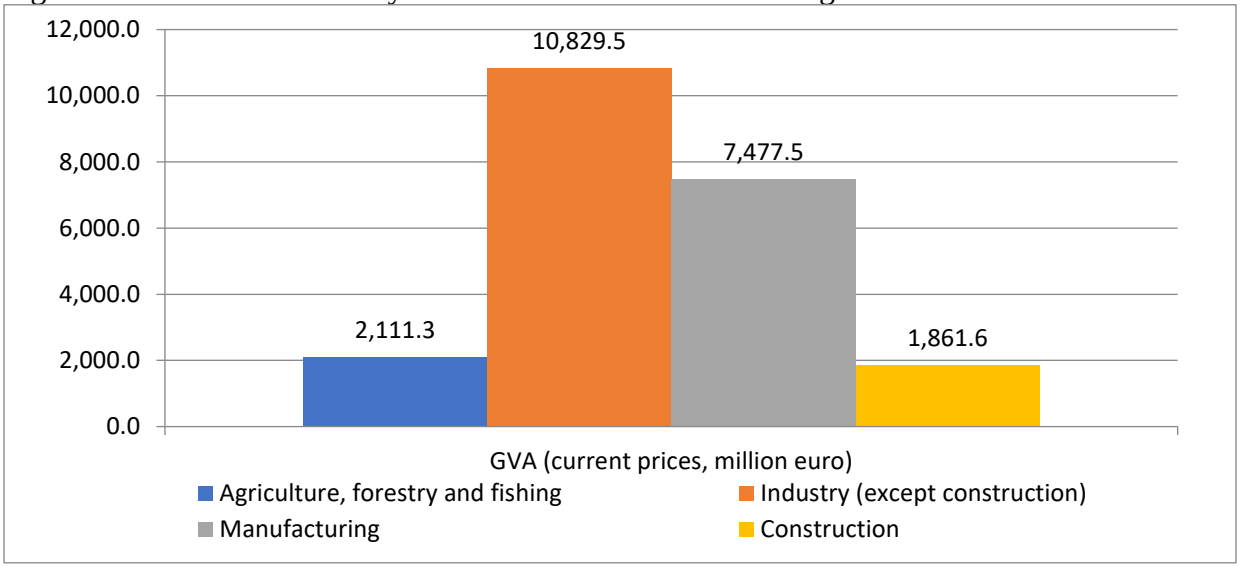
The rural economy has developed under the favorable conditions of macroeconomic stability. The Bulgarian economy has continued to grow steadily. Real GDP grew by approximately 3.2% in 2018, driven by domestic demand. The GDP growth is above the EU average comparing with the EU-28, but Bulgaria is still far from achieving cohesion with the countries EU-28. The GDP per capita in mostly rural areas is 7,980 euro (2018), it has increased almost twice (49.5%) for the period (2008-2018), but it remains significantly below of the EU-28 30,960 euro. The GDP per capita is in a range from 4570 euro in the poorest region (Northwest region) and up to 11715 euro (Southwest region). There is a wide economic discrepancy across the regions. The deviation in income shows a big difference in economic potential and investment activity in the country.

The structure of the GDP shows that around 40% is created in predominantly urban areas, 50% in intermediate and only 9% in predominantly rural areas. Gross value added (GVA) is EUR 48,634.1 million in 2018. The share of agriculture in GDP is 3.9%, industry is 21.6% and share of services is 45.2%, respectively.

The general structure of Gross Value Added (GVA) is distributed as: 67% services (wholesale and retail trade, transport, accommodation and food services are included), 28% industry and only 5% is agriculture. The contribution of the regions to the GVA is: 40% comes from mainly urban areas, 51% from intermediate regions and only 9% of mostly rural regions. The GVA created by agriculture sector in urban regions is less 1%, intermediate areas contribute to 76%, and the share of rural areas in GVA of agriculture is 22%. The industry sector of mostly urban areas contributes around 20% to GVA, the share of intermediate regions is higher around 70% and the smallest share around 15% is created by mostly rural areas. In the services sector, 47% of GDP is generated from predominantly urban areas, the intermediate ones contribute to 13% and the smallest contribution to GVA 6%. in services is from rural municipalities

In the period 2011-2014 the contribution of agriculture to GVA is over 5%. The stability of the sectors in terms of their share in GVA shows that there have been no structural changes in the economy over the period.

Figure 1. Gross value added by main economic activities in Bulgaria



Source: Own calculations according to Eurostat data

Economic growth is an important factor influencing poverty, there is a strong association between national per capita income and national poverty indicators. In Bulgaria 1.5 million people or 22% of the total population are below the poverty line. The poverty rate declined it is a results of macroeconomic and financial stability and job creation. Territorial levels of poverty are emerging in the country. People living in poverty in the North-West region is becoming an acute social problem, as the poverty rate is 44.4% and is the highest in the country. The poverty rate in the North-Central region decreases in 2018 - 31.5%.

2. The characteristics of small firms in rural areas

Micro business is a backbone of the economy in rural regions. Small medium enterprises (SMEs) are a key prerequisite for the existence of competition and functioning markets, and hence for the overall economic development of a country. It is no coincidence that EU business support policies focus specifically on supporting small and medium-sized enterprises to stimulate entrepreneurship and job creation, as well as a source of innovation. There is a wide range of possible sources of support, drawn from both Common agricultural policy and program for rural development (concrete measure for supporting the business in rural areas and LEADER/CLLD. Other sources include credits, but that rural firms face greater difficulties in accessing credits. The Rural development program (2014-2020) provided intervention for supporting business in rural area (Measure 6.4 Investment in non-agricultural activities).

The number of enterprises in the country is 406 310, in rural areas it is 107,312 or 26% of the total number in the country. The structure of SMEs is dominated by the micro enterprises, the share of micro-enterprises is around 92% (both at national level and rural areas). Their number of micro, small and medium enterprises has not changes at national level. The micro enterprises are concentrated in the following sectors: „Trade; repair of motor vehicles and motorcycles “, „Hotel and restaurant services “and “Transport, storage and post”, mainly in service sector and tourism.

Support is provided to existing micro-enterprises and creation and development of new business. Microenterprises play significant role in generating the employment and income in in rural areas

The number of micro enterprises in rural areas in 2008 is 72229 or 89% of all enterprises, and they increased by 26,235 (36% growth) in 2017 than 2008. The growth of the micro enterprises is due to national policy and public subsidies for supporting economic activities in rural areas.
SMEs (small-sized – from 10 to 49 employees, medium-sized - from 50 to 249 employees) in rural areas in 2008 are 6461 or 8% of all enterprises in rural areas, and they decreased of 323, or 5,6% in 2017. The decline of these enterprises may also be due to the discontinuation or cessation of activities in some municipalities.
Large enterprises (over 250 employees) in rural areas in 2008 are 77, or just 0,1% of all enterprises. The large enterprises are located mainly in urban and industrial cities and their peripheries.

Table 2. Enterprise groups in rural areas

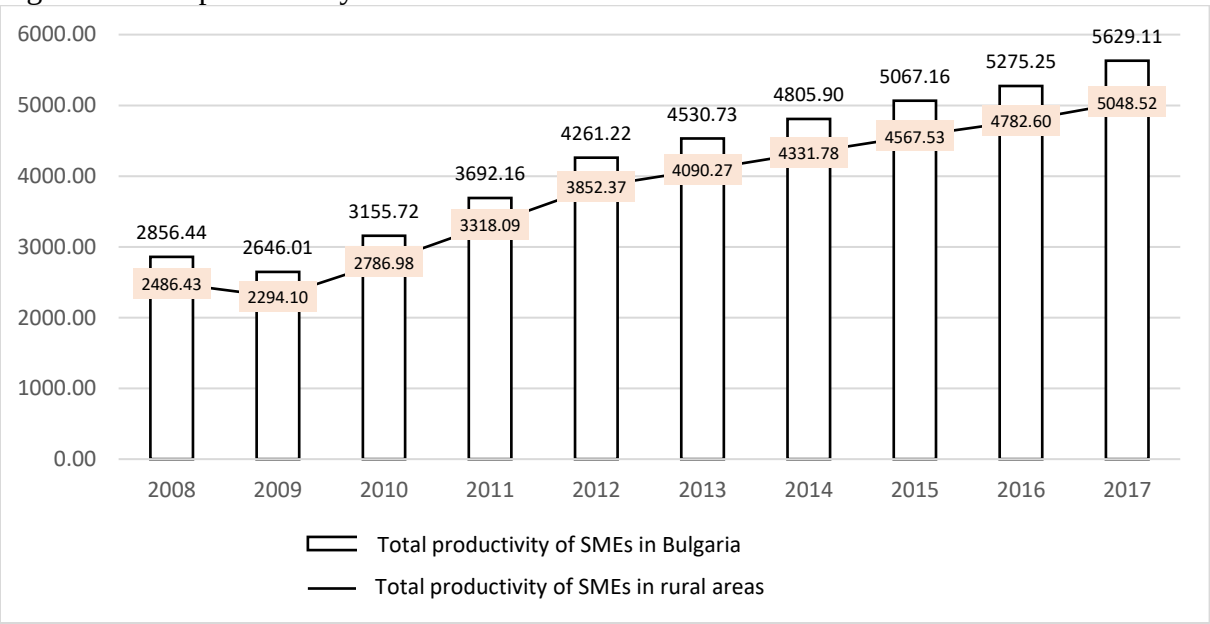
Enterprises by number of persons employed in rural areas									
Years	Micro-sized enterprises	share of micro enterprises	Small enterprises	share of small enterprises	Medium	share of middle enterprises	Large	share of lagre enterprises	Total enterprises
2008	72229	89%	5641	7%	820	1,0%	77	0,1%	81148
2009	84274	91%	5599	6%	734	0,8%	61	0,1%	92710
2010	85099	91%	5032	5%	709	0,8%	65	0,1%	93366
2011	85745	91%	5070	5%	691	0,7%	71	0,1%	94161
2012	89637	92%	5150	5%	662	0,7%	69	0,1%	97578
2013	91197	92%	5150	5%	676	0,7%	70	0,1%	99618
2014	93183	92%	5081	5%	681	0,7%	74	0,1%	101198
2015	95791	92%	5224	5%	595	0,6%	67	0,1%	104087
2016	98126	92%	5294	5%	647	0,6%	63	0,1%	106873
2017	98464	92%	5485	5%	653	0,6%	67	0,1%	107312

Source: Own calculations according to NSI data

In the country the smallest companies with less than 9 employees are dominated. In 2017, micro enterprises were out of a total of 117000 registered companies in Bulgaria.
The structure of SMEs indicates that the share of micro enterprises is around 92% (both at national level and rural areas), primarily at the expense of the small and less pronounced medium and large enterprises. The micro and small enterprises are dominated in the business structure. Their number has increase at national level. The trend of increasing revenues is observed for micro, small

enterprises from sectors: „Trade; repair of motor vehicles and motorcycles“, „Hotel and restaurant services“ and “Transport, storage and post“ .
The structure of the enterprises in EU-28 is similar to Bulgarian ones. Micro-enterprises account for 92.8% of enterprises, small enterprises account for 6.0%, and medium enterprises account for only 1.0%, large enterprises account for only 0.2%.[2]
The productivity of SMEs in rural areas followed the national trend of productivity growth. The labor productivity of the SMEs enterprises located in rural areas is below than national level. The reason is that most of the enterprises are not in manufacture sectors.

Figure 2. Total productivity of SMEs



Source: Own calculations according to NSI data

There is divergence across the municipalities, it relates the employment rate and the unemployment rate. Employment grow slowly in rural municipalities, but it is less than the big cities and urban region. Distribution of employment by economic sectors in rural areas is as follows: agriculture - 18.9%, mining - 1%, manufacturing 1%, wholesale and retail trade, repair of motor vehicles and motorcycles - 15%, Transport and storage - 6%, hotel and restaurant business 4%, Information and communication - 2%, etc. The agricultural sector provides a significant part of the jobs in rural municipalities. The relative share of employees in rural areas is 33% and 67% in urban areas (2017). There is a divergence of the labor market cross the it is due to the difference in the economic development and investment activity.
Unemployed people are relatively unevenly distributed in rural municipalities. The long-term unemployed are in municipalities in the North-West and North-Central regions, where the labor market has been limited for years, it is due to structural problems in the economy. The long-term unemployed in rural municipalities are mostly people with low educational and qualification level.

[2] http://www.microsmetraining.eu/pdf/MICRO_European_Comparative_Report.pdf

The highest average annual income per capita is recorded for Sofia-city - BGN 8,224, Pernik - BGN 7,049 / person, Plovdiv - BGN 6,163 /. The population with lowest average annual income lived in: Pazardzhik - BGN 4,180 / person, Sliven - BGN 4,446 / person and Targovishte - BGN 4,576 / person. (2018)

A big discrepancy remains in respect to average gross monthly salaries of the employees. The average salaries of employees in rural areas is lower by 11% than urban areas.

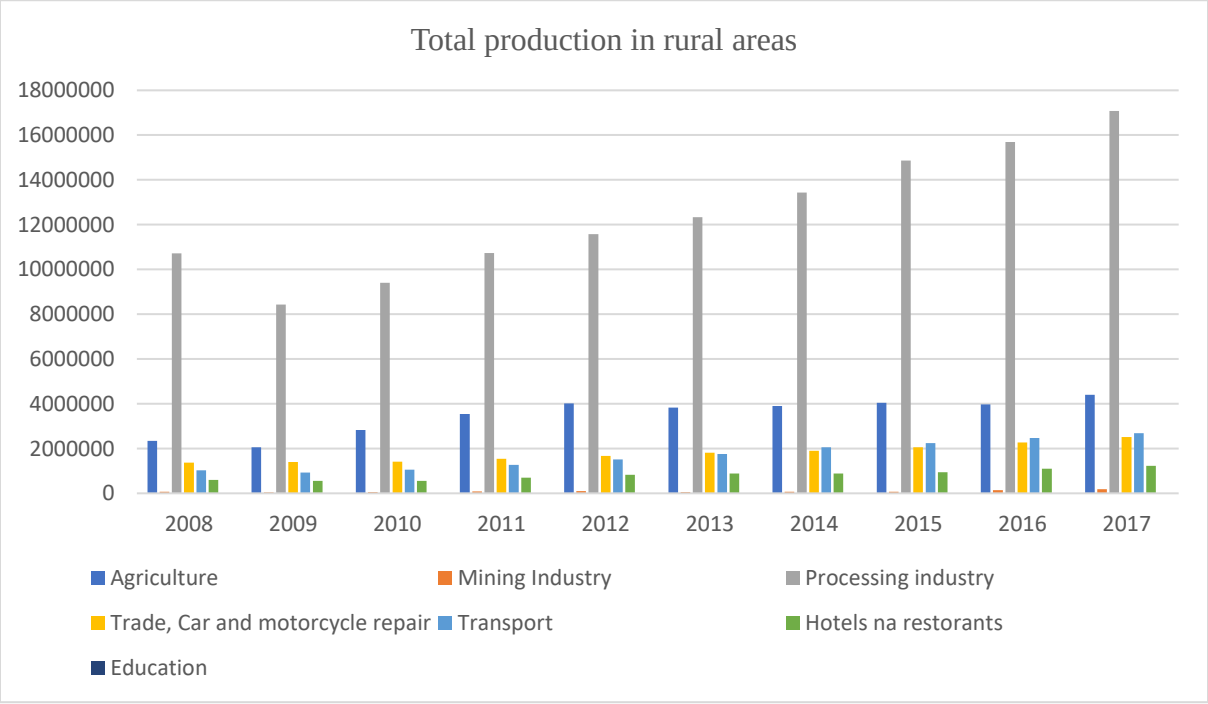
The municipalities with the highest growth of the average gross salary for 2017 compared to 2008 are: Chelopech - the increase is by 42%, Letnitsa- the growth is 71%. The increase of wages is a result of well –developed „Manufacturing". There are large enterprises from the ceramics and food industry. The investments in the local economy is a main factor for income growth.

Microenterprises provide employment and generate income in both urban and rural areas. Micro enterprises in rural areas face difficulties to market assess and introducing innovation and innovative products.

The activities of micro and small enterprises are not in the information technology sector, digitalization in rural municipalities. Most micro businesses belong to the family business.

The production enterprises in the rural areas is BGN 24342246 thousand (2008), the production increase and its value is BGN 38538710 thousand (2018), the growth is around BGN 14196464 or 36.8%. The increase of the production is a result of favorable economic environment.

Figure 3. Total production in rural areas (2008-2017)



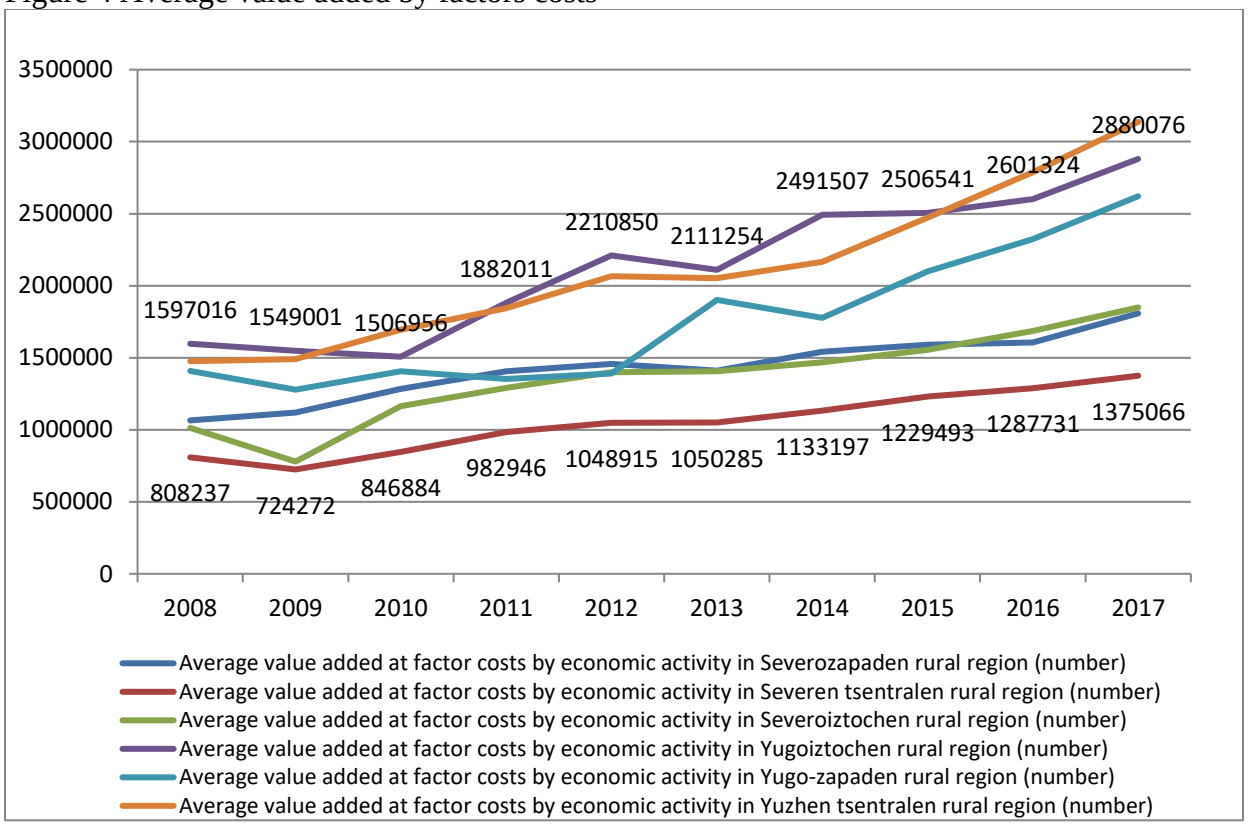
Source: Own calculations according to NSI data

The volume of production of the enterprises is BGN 39,091,503 thousand. for 2018, around 32% of employees in the economy. The revenues from the activity of these enterprises are BGN 53,859,850 thousand, or 53% higher than 2008.

The production of small enterprise is 19.5% of the total production of micro-enterprises in the country. This type of enterprise provides of 22% of the total number of employees in the country. The revenues from the small enterprises are BGN 10,752,496 thousand (2017), it is more by BGN 3,251,270 or the growth is 40% compared to 2008.

The analysis showed there are significant imbalances between rural and urban areas in respect the number of enterprises, production and income. Diversification of the economy is obvious in municipalities where population in working age prevailed. Despite of the achieved a progress in terms of economic development, the contribution of micro and small enterprises to the total output at national level is lower compared to urban municipalities

Figure 4 Average value added by factors costs



Source: Own calculations according to NSI data

The value added by factor costs from the production is 23.2% of the total value of this indicator at national level. The data confirmed the increase the value added by factor costs for micro enterprises last ten years.

The value added by factor costs of small enterprises recorded positive trend as follows: urban areas it is BGN 9206807 thousand (2017) the increase is approximately 30.5% compared to 2008 and, the rural municipalities it is BGN 2418449 thousand or around 58.5% compared to 2008.

The level of innovation entrepreneurial activity are factors for exploiting the potential of SMEs. Agricultural sector is a main source for income and job in rural areas, particularly, Northern Bulgaria.

RELATIONSHIP OF INDICATORS

The correlation is used to show the dependence among the main following indicators: Value added, number of enterprises, average level of monthly salaries.

Table 3. The value of the indicators

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Value added by factor costs (thousand BGN)	7365165	6940811	7901845	8758133	9571827	9932066	10577212	11453848	12291970	13669938
Non-financial enterprises (number)	81148	92710	93366	94161	97578	99618	101198	104087	106873	107312
Average gross monthly salaries (BGN)	4984	5562	5904	6114	6447	6864	7295	7777	8381	9136

Source: own calculations

The correlation is a statistic method for finding the dependency of the variables. The absolute value of the correlation coefficient is in the range from 0 to 1[3].

Table 4 Result of the Correlations

Correlations	Ratio
Value added at factor costs and Number by non-financial enterprises	0,896071
Number by non-financial enterprises and Average gross monthly salaries	0,941431
Value added at factor costs and Average gross monthly salaries	0,984895

Source: NSI data, own calculations

[3] The interpretation of the value of the correlation coefficient (the strength of the dependence) is somewhat arbitrary

The correlation[4] between average value added and average gross monthly salaries of the employees is 0,981074065 it means that there is a strong dependence between the both variables. It means that there is a strong connectivity of the salaries of the workers and profitability of the enterprises. Second correlation shows the relationship between Average value added (by factor costs) and Average number of non-financial enterprises per rural municipality (number). The correlation is positive, it is 0,888535504. It confirms that the value added is higher where the located enterprises have a contribution to the national economy.

Third correlation consists of two variables Average non-financial enterprises and Average gross monthly wages and salaries of the employees. The correlation coefficient is 0,94246604 the relationship between variables is very strong.

The positive dependence is obvious the increase of Average gross monthly salaries of the employees is proportionally to increase of the Average value added.

The analysis indicates that the increase of all three indicators is not result of the number of inhabitants, the number of population has a negative effect on the above observed indicators.

According to the results of correlation the number of enterprise is a main condition for the prosperity of the local economy. It influences positively for attracting young people to live in rural municipalities.

CONCLUSIONS

Development of the rural muniipalities is defined by the overall socio-economic picture and of the stability of the macro-environment.

The human factor is a one of the key determinat for the economic activity. The other conditions which are the background of local competitiveness and vitality are infrastructure are level of the public services.

Demographic challenges continue to constrain growth the situation is more acute in lagging regions. Lagging regions have both fertility and net migration rates that fall below the urban average. Lagging and non-lagging regions differ significantly in their structures of employment, and marked lower productivity. The diversification of agricultural activities ensures to overcome income risk and it can make a significant contribution to the improvement of the living standards of rural residents.

The policy for support the diversification of the rural economy, investment sectors should be integrated with industrial activities in new type of business activities and innovations.

The micro enterprises continue to have positive spill-over effects on the local economy. Microenterprises play significant role in generating the employment and income in in rural areas

The economic profile of most rural settlements is formed by agriculture and family business. The family business has self-sufficient production character and the employment opportunities is restricted, particularly in the rural municipalities.

The key question underlying the paper is the extent to which small businesses located in rural areas have distinctive support needs. This analysis has demonstrated that there is a considerable support

[4] The absolute value of the correlation coefficient is in the range from 0 to 1.

for rural business, but the question is that the business is concentrated in trade and services, not in manufacturing.

The main drivers of the changes of the economic profile of the rural municipalities are:

- Technological change - the digital and other forms of technological development offer the potential to increase efficiency and productivity; Encourage development in emerging sectors such as renewable energy and biotechnology.
- Demographic change- Population ageing, migrations between rural and urban areas are the major factors whose impacts on the local economy. This is challenge could be overcome by creation of opened opportunities for revitalising depopulated villages.
- Entrepreneurship – build business opportunities.
- Local governmental policy is especially important for creating economic policy targeted specifically at SMEs.

The rural development Program (2014-2020) offer a range of tools measures which can support rural business change and development.

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ANALYSIS OF THE LAND REFORMS AND INSTITUTIONAL CHANGES IN BULGARIA AND MOLDOVA

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ABSTRACT

The dynamics in the development of complex processes related to the improvement of land relations in Bulgaria in recent decades has led to significant institutional changes in the agricultural sector of the country. This dynamic of the Ownership and Use of Agricultural Land Act reveals the existence of real issues in the socio-economic system of agriculture and the need to solve them.

The role of changes in land relations in Bulgaria and Moldova over the past 30 years has had an impact on the development of agriculture and the implementation of programs offered at national and international level in both countries.

The purpose of this article is to analyze the changes in land reforms that have occurred in the implementation of the common agricultural policy. In order to achieve the set of goals, the land reforms in the two countries, the structural and organizational changes of the agricultural holdings and the role of the programs for support and development of the agricultural sector in Bulgaria and Moldova will be considered. In conclusion, a comparative analysis will be made and the institutional changes related to land reforms in the two countries will be analyzed.

Key words**:** *Bulgaria, Moldova, land relations, land policy, land reform.*

INTRODUCTION

The dynamics in the development of complex processes related to the improvement of land relations in Bulgaria in recent decades has led to significant institutional changes in the agricultural sector of the country. This dynamic of the Ownership and Use of Agricultural Land Act reveals the existence of real issues in the socio-economic system of agriculture and the need to solve them. The impact of the institutional changes on the land relations in Bulgaria over the last 30 years is in response to the number of processes and changes that have taken place before and after the accession of the country to the European Union. The Ownership and Use of Agricultural Land Act, logically, has undergone the most changes (more than 70 changes by 2020). In most Central and Eastern European countries the choice of land reform design was unlimited. But the real process of land reform was limited by two factors - "'historical' or 'social' justice." (Swinnen, J.,Buckwell, A. and E. Mathijs, 1997). [5]

MATERIALS AND METHODS

The purpose of this article is to analyze the changes in land reforms that have occurred in the implementation of the common agricultural policy. In order to achieve the set of goals, the land reforms in the two countries, the structural and organizational changes of the agricultural holdings and the role of the programs for support and development of the agricultural sector in Bulgaria and Moldova will be considered. In conclusion, a comparative analysis will be made and the institutional changes related to land reforms in the two countries will be analyzed. The empirical analysis is based on data gathered in Bulgaria. The country is characterized by good natural conditions for agricultural production that make it possible to grow a great variety of different crops. (Dirimanova, V., 2019:37) **[**1**]**

The Land Act sets out the rules relating to the administrative procedures for creation of land units, voluntary consolidation of agricultural land with change of the ownership right, registration of the relevant documents for the use of agricultural land for the purposes of support under Single Area Payment Schemes, etc. The administration of land relations and, in particular, of land use, sets out important boundary conditions for land markets and the institutional framework is a decisive factor. (Yovchevska, Pl. et al., 2019:18) [2]

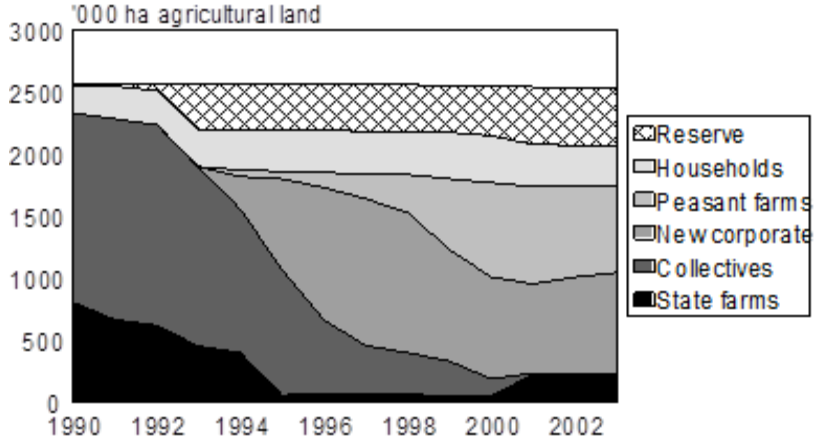
RESULTS AND DISCUSSIONS

For instance, the agriculture modernization process involves encouraging farmers to try new crops, new production methods and new marketing skills. The Republic of Moldova is situated in Eastern Europe between Romania and Ukraine. It was part of the Soviet Union and declared its independence in August 1991. During the Soviet era all agricultural land was state-owned. Land was used for large-scale farming in collective or state farms and typically organized with one large farm per village. Collective farm, in the former Soviet Union in Moldova, was a cooperative agricultural enterprise operated on state-owned land by peasants from a number of households who belonged to the collective and who were paid as salaried employees on the basis of quality and quantity of labor contributed.

Agricultural reforms in the Republic of Moldova began in early 1991, six months before the breakup of the Soviet Union and the declaration of Moldova's independence. In addition to the basic tasks of land reform and restructuring of collective and state farms, the sectoral reform program included liberalization of agroprocessing and trade, and the creation of a new institutional framework for agriculture. By the end of 1997, the share of individually owned agricultural land rose to 21 percent /up from 12 percent in 1992/, while the share of the state sector declined to 18 percent/down from 25 percent in 1992/. Despite the uncertain start and delay of reforms, Moldova has achieved significant progress in creating a privatized agriculture and food sector. One-quarter of Moldova's agricultural land has now been transferred to 350000 smallholders. Many of these smallholders are inactive for reasons of age or health, while others do not have the skills to farm efficiently.

Moldova's land markets are still very thin. Land transactions were registered in 160 of the country's 800 communes. More than half the area traded in these transactions was concentrated in only nineteen villages, where the amounts traded varied from 10 to 300 hectares per village. In the remaining 141 villages the land areas traded did not exceed 10 hectares.

Figure 1. Structure of agricultural land use in Moldova 1990-2003.



Source: State Cadastre; Report No. 36366-MD, Moldova: Agricultural Policy Notes, Policy Priorities for Agricultural Development, Volume I—Land, June 1, 2006, Report No. 36366-MD.

An improved and supportive legal framework is in now in place. It simplifies, at least on paper, the registration process for private farms and allows for accelerated farm restructuring and land transactions. The main issue is full implementation of the existing legal provisions. Some local authorities have not supported reform and have sometimes obstructed or delayed the implementation of new regulations. Land reform in Moldova has had positive effects on the families of private farmers which were better off and more optimistic about the future than their counterparts in collective farms. This was an encouraging sign for the future of Moldovan agriculture. Fragmentation of agricultural land is perhaps the greatest concern of Government and certain other stakeholders in the agricultural sector. [3]

Bulgaria is a country with propitious conditions for agricultural production. Rich soils together with favorable climatic conditions form the natural base for incomes and employment for Bulgarian rural households. Apart from favorable natural and climatic conditions, the ways in which the use of land is institutionalized are crucial for Bulgarian farmers. Formal and informal rules govern not only the relations among owners and users, but also those between natural resources and their users. Land as a natural resource may have multiple functions. Property rights define how society distributes the potential income streams that may be appropriated from these functions among its members. (Dirimanova, V., 2008:11) [6]

In 2019, the new Bulgarian Agricultural Land Act was published. The Act aims at codifying the matter in the field of ownership and use of agricultural land. It represents and further develops much of the existing legislative framework, while introducing some new situations imposed by the practice in view of the evolving public relations. Last but not least, the Act aims at eliminating some discrepancies between the various regulations presently in force. Bulgarian farmers strive to produce outputs which market realization will ensure the highest return on invested resources – land, capital and labor, and the best profit. A significant proportion of farms have as their primary task the reduction of the risk by means of product specialization, where the profitable production compensates for the unprofitable one in order to survive. [7]

The challenges that Bulgarian agriculture has been facing since the accession of our country to the Common European Market in 2007 are associated with overcoming of some organizational and economic issues such as the low level of production efficiency and weak competitiveness of agricultural production. The presence of favorable natural and climatic conditions, longstanding traditions, wealth of experience, development of new technological solutions, use of modern varieties with high biological potential, outline the tendencies for market survival and development of Bulgarian farms.

A serious problem of the agricultural sector in Bulgaria is the low level of specialization of farms as a whole. The weak specialization leads to an unsatisfactory level of implementation of new technologies, and low competitiveness. The level of competitiveness as well as the specialization of agricultural production are main factors for the better functioning of farms engaged in vegetable production, which is a prerequisite for sustainable development of vegetable farms. The main problem is the weak market orientation of most vegetable growing farms. Two types of farms can be outlines:

1. Professional farms that produce exclusively for the market;

2. Small farms which produce mainly for their consumption and sell only a part of their production on the market.

Table 1. Average size of agricultural land by years in hectares (in Ha)

Year	*Land*	*Pastures, meadows and bushes*	*Agricultural lands total*
2015	0.553	1.215	0.614
2011	0.554	1.227	0.616
2008	0.560	1.242	0.624
2007	0.563	1.263	0.629
2006	0.565	1.275	0.632
2005	0.569	1.288	0.636

Source: Ministry of Agriculture, Food and Forestry, balance of agricultural land, 2015.

The average size of agricultural land is in a relatively large range in individual areas (from 0.29 to 1.74 ha), which has a negative impact on agriculture production. Statistics show that in areas with low average property size land use is difficult, users experience greater than usual difficulties when concluding contracts for use with owners.

CONCLUSIONS

Bulgaria is comparatively small both in territory and population. Despite this geographical feature, our country enjoys a great variety of favorable natural and climatic conditions and has a great potential for cultivating a lot of agricultural crops. By tradition, the agriculture has been a major sector of Bulgarian economy because of its crucial social and economic significance.

Agriculture has been a basic occupation and source of income for a great number of families in rural areas. [8]

The fragmentation of the basic production resource – the land, the inevitable dependence of agriculture on geographic and climatic conditions, the outdated agricultural equipment, the low level of mechanization of production process and the low wages of those employed in production are just a small part of the current issues prevailing in Bulgarian agricultural sector. [8]

The land reform and inheritance patterns in Bulgaria created many jointly owned and dispersed plots. Land fragmentation in ownership and use increased the costs of using land and decreased the benefits received from it. At the local level, informal mechanisms have already been established to circumvent the high transaction costs among co-owners and land users. [4]

The new Agricultural Land Act seeks to clarify the use of agricultural land by fixing a maximum duration of contracts, which shall be long enough to allow farmers to plan their future activity in vegetable farms and to protect the producers who have invested in this activity. The Act will restrict big corporations (foreign legal entities) from purchasing land and will allow young farmers (up to 40 years) to participate in land-lease tenders of land from the State Land Fund.

ACKNOWLEDGEMENTS

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ENVIRONMENTAL SUSTAINABILITY ASSESSMENT OF AGRICULTURE

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Agriculture can be considered as an industry that has a particularly large environmental impact due to the nature of the activity - resources such as land, water, plants, animals, etc. are used, ie. agriculture uses natural resources and sometimes has a negative impact on them, but at the same time has the potential to contribute most to their conservation. The balance between these two types of impacts represents the degree of environmental sustainability.

The environmental sustainability of agriculture is associated with the conservation, restoration and improvement of all constituent elements of the natural environment. These include air, water, land, landscapes, biodiversity, climate, maintaining animal welfare - farmed and wild. Generally speaking, how sustainable agriculture is will depend on how compatible it is with environmental requirements.

The ecological pillar of agrarian sustainability is of paramount importance in assessing the overall sustainability of agriculture, because the link between agriculture, the environment and food security is unique and complementary.

Determining the compatibility of agriculture with the environment and assessing its impact on it requires information on certain interactions between them, based on sustainability assessment aproaches. Sustainability assessment approaches are the subject of discussion and depending on the concept, goals, time and scope, different conceptual frameworks and approaches are offered, with different types and numbers of indicators. SAFE (Sustainability Assessment of Farming and the Environment) approach to agriculture and environmental sustainability developed by Van Cauwenberg at al (2007) and others is generally based on the concept that sustainability of agriculture and the environment can be assessed using a hierarchical framework composed of principles, criteria and indicators and benchmarks in a structured way. The framework is intended for three spatial levels: a plot, a farm and a higher spatial level, which can be a region or a country.

It is this approach that underpins the research work on the sustainability of Bulgarian agriculture, within the framework of a research project developed by the research collective of the Institute of Agricultural Economics - "Sustainability of Agriculture in Bulgaria" (2017-2018), managed by prof. Dr. Chr. Bashev, part of which is the present study.

The aim of this study is to approbate and present a system for assessing the ecological sustainability of agriculture in Bulgaria, based on the existing approaches and the relevant rational for choosing principles, criteria and indicators.

As for the other aspects of sustainability, for the assessment of environmental sustainability, a sistem of principles and criteria, indicators and benchmarks has been used.

Based on a critical review of a number of literary sources, studies, official documents and consultations with institutions, initial principles, criteria and indicators for the ecological sustainability of agriculture in the country were defined. As a next step, the initial version of the selected indicators was sent to independent experts to evaluate the indicators according to the relevant criteria - to obtain information on the significance of each indicator and on the extent to which the sustainability of agriculture is reflected. Finally, a model system with principles, criteria, indicators and reference values for assessing the ecological sustainability of agriculture in Bulgaria is defined (as an integral part of the system for determining the overall agrarian sustainability).

Environmental indicators provide information on the status of ecosystems and the impact of human activity on them. There are many different types of environmental indicators - they can be used to reflect different aspects of ecosystems, including biological, chemical and physical. The development and selection of environmental indicators is a complex and responsible process, it is precisely work because of this diversity and multiplicity.

The indicators chosen in this analysis are only part of the many possible indicators for the environmental pillar, so the analysis does not claim to be comprehensive. Our aim was to cover all the criteria using those metrics for which the necessary information was available. Information about the indicators is taken from various official sources - EEA, MOEW, NSI, MAF, Eurostat, Agrarian reports, normative documents, programs and agreements, etc., and for some indicators expert assessments were used. Benchmarks and expert assessments were used to determine sustainability indices by indicators.

The main results of the paper are related to the assessing the ecological sustainability of agriculture. Based on the sustainability indices by indicators and criteria, sustainability indices by principle are calculated. On this basis, a general sustainability index of the ecological pillar at the level of the agriculture sector is calculated. According to the scale developed, the resulting index determines the level of environmental sustainability of agriculture at the sectoral level.

A scale with appropriate levels of agrarian sustainability was used.

High - 0.81 to 1;

Good - 0.5 to 0.8;

Satisfactory - from 0.26 to 0.49;

Unsatisfactory - from 0.06 to 0.25;

Instability - 0 to 0.05.

The scale presented on the basis of sustainability levels by indicators determines the sustainability levels by criteria and principles, and finally a general assessment of environmental sustainability for the agriculture sector is made.

The results on indicators, criteria and principles are summarized and overall, the level of sustainability of the ecological pillar in agriculture in Bulgaria at the sectoral level, based on this analysis, is rated as good (0.56).

I. The principle of air protection – 0,62

1. The greenhouse gas reduction criterion – 0,53

The indicators analyzed:

- change in the share of agriculture in greenhouse gas emissions in CO2 equivalent
- annual GHG emission per capita.

2. The criterion of 'maintaining and improving air quality' – 0,70

The indicators analyzed:

- the reduction of emissions of harmful substances into the air by agriculture
- ammonia emissions into the air
- share of agriculture in emissions of harmful substances.

II. The principle of protection of agricultural land – 0,74

3. Criteria for minimizing soil losses – 0,75

The indicators analyzed:

- loss of soil from water erosion
- loss of soil from wind erosion
- wind erosion index of soil.

4. Criterion 'Conservation and improvement of soil fertility' – 0,71

The indicators analyzed:

- quantity of nitrogen fertilizers

- quantity of phosphorus fertilizers

- density of animals per unit area.

5. Criterion “Maintaining a balanced structure of land resources” – 0,62

The indicators analyzed:

- share of arable land in UAA

- share of arable land in UAA

6. Criterion "Preserving landscape features" – 0,88

The indicator analyzed:

- the size of the area covering the requirements for green direct payments by maintaining landscaping elements to arable land (2016).

III. Water Conservation Principle – 0,66

7. Criterion "Maintenance and improvement of surface and groundwater quality" – 0,66

The indicators analyzed:

- Groundwater pollution index with nitrates

- Average value of groundwater pollution with nitrates

- Average pollution of surface waters with nitrates.

IV. The principle of "Efficient use of energy" – 0,65

8. Criteria for minimizing the use of conventional energy – 0,65

The indicators analyzed:

- Share of final energy consumption in agriculture from total energy consumption

- Final energy consumption / ha UAA in agriculture.

V. The principle of biodiversity conservation – 0,42

9. Criterion "Maintenance and improvement of natural habitats, conservation and enhancement of habitat species" – 0,24

The indicator analyzed:

- Change in the number of habitats.

10. Criterion "Protected agricultural lands and territories" – 0,61

The indicator analyzed:

- Protected agricultural lands and territories through the share of agricultural land in NATURA 2000 and others. Protected Areas.

VI. Animal Welfare Principle – 0,40

11. Criterion "Compliance with animal welfare principles" – 0,40

The indicator analyzed:

- Level of compliance with animal welfare principles.

VII. The principle of organic production – 0,54

12. Criterion "Increasing the share of organic production" – 0,54

The indicators analyzed:

- Share of area in organic farming / UAA
- Share of animals in OF / total number of animals
- Share of bee families in OF / total number of bee families

VIII. Principle "Adaptation to changes in the environment" – 0,63

13. Criterion "Adaptability to climate change" – 0,63

The indicator analyzed:

- Variation in yields for wheat over a 5 year period.

IX. The principle of "Waste management in agriculture" – 0,36

14. Criteria for the reduction of agricultural waste – 0,36

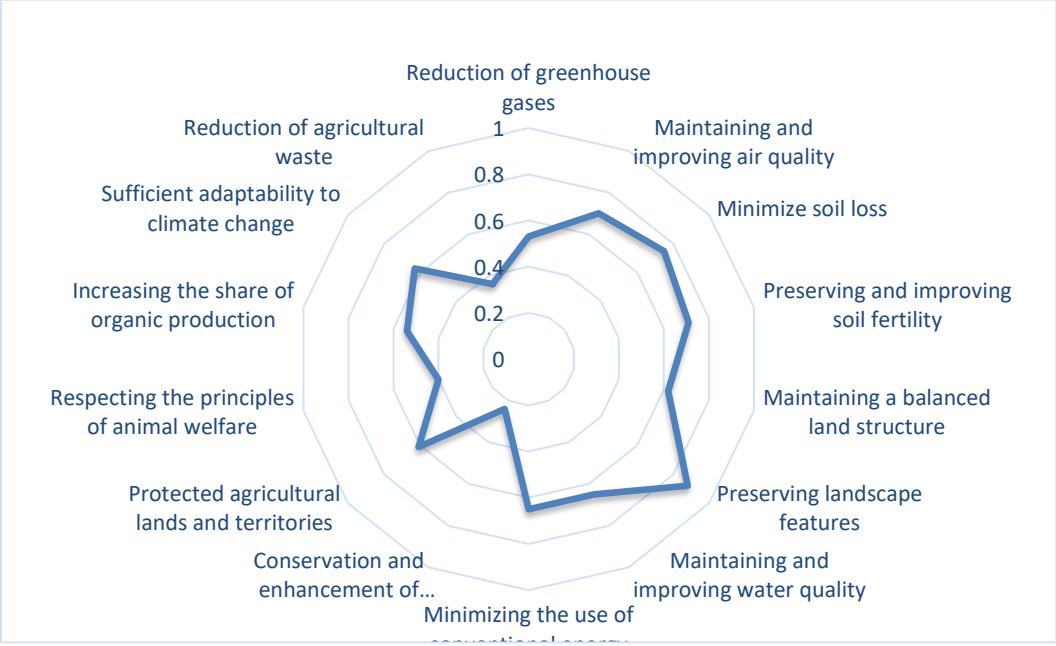
The indicators analyzed:

- Share of livestock farms with turfs from the total number of livestock farms
- Reduction of agricultural waste.

Based on the derived indices of stability by indicators, indices of stability by criteria are derived. According to the developed scale, the obtained indexes by criteria and their respective levels of stability are presented.

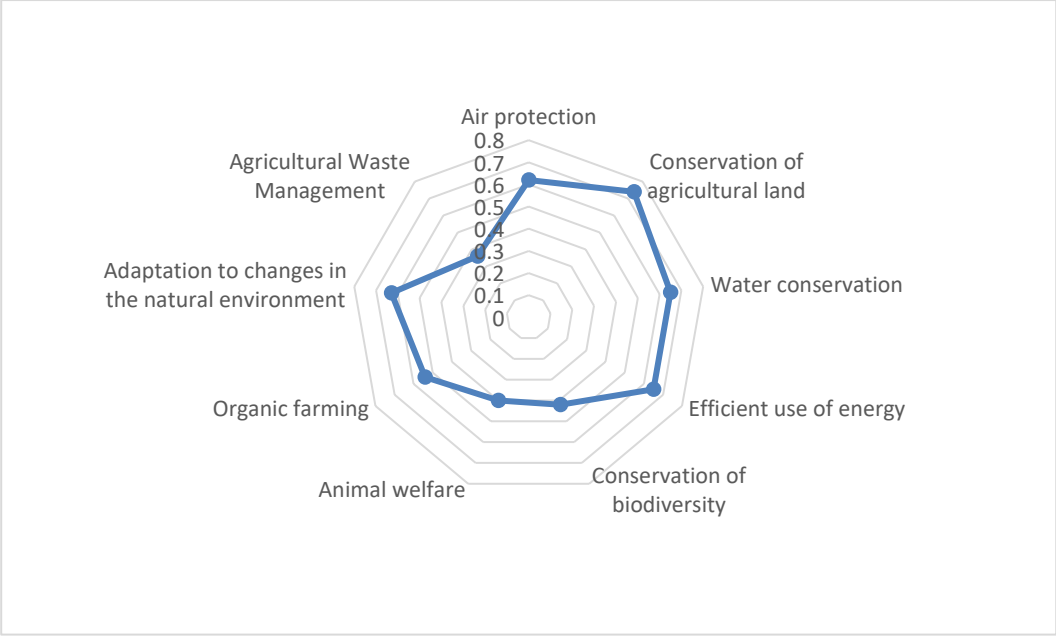
Based on the derived sustainability indices by criteria, sustainability indices by principle are calculated. On this basis, a general sustainability index of the ecological pillar at the level of the agriculture sector is derived - 0.56. According to the scale developed, the resulting index determines the level of environmental sustainability of agriculture at the sectoral level as “good”.

Fig.1. Environmental sustainability indeces of the agriculture sector by criteria



Source: Author

Fig. 2. Environmental sustainability indeces of the agriculture sector by prinsiples



Source: Author

The following conclusions can be drawn from the analysis carried out for the agricultural sector:

- a good level of environmental sustainability;
- a good level of protection of agricultural land, water and air;
- a good level of energy use;
- good adaptability to climate change;
- a good level of organic production;
- a satisfactory level of biodiversity conservation, animal welfare and waste management.

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DEMOGRAPHIC REALITIES AND THE FUTURE OF THE LABOR MARKET IN THE RURAL AREAS OF BLAGOEVGRAD, KYUSTENDIL AND PERNIK DISTRICTS

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ABSTRACT

The aim of this study is to trace the impact which demographic changes have on the rural labor market in the districts of Blagoevgrad, Kyustendil and Pernik (administrative-territorial units of NUTS 3 level) during the period between 2011 and 2017. From the analysis of the current situation and trends in the demographic development of the rural population in those spatial units, a steady downward trend concerning the population number (a decline of 6.7%), and the number of workforce respectively (by 51.4%) has been established. Based on the analysis of 6 demographic indicators selected for the purpose of the study, municipalities of higher and lower workforce potential have been identified. The municipalities of Garmen, Belitsa, GotseDelchev, Satovcha, Yakoruda, Petrich, Sandanski and Razlog exhibit better demographic characteristics and a greater workforce potential. The deteriorated demographic situation in municipalities such as Nevestino, Treklyano, Kovachevtsi, Breznik, Zemen, Boboshevo, Kocherinovo and Tran, will continue to affect the number of children, the working population contingent and, respectively, the workforce quantity and its supply on the local markets. The significant differences in the levels of the demographic indicators observed between the rural municipalities in the studied area make it necessary to implement specific measures for each municipality, depending on the level of natural and migration growth and decline, as well as the workforce formation trends. The analysis of the latter can help the authorities make better management decisions related to the overall socio-economic development, and critically assess the investments attractiveness of the area, which can result in creation of new jobs and retention of the working population.

Keywords: rural areas, labor market, demographic processes, fertility, mortality, migration

INTRODUCTION

The current state and future trends of the human resources in the rural areas of Blagoevgrad, Kyustendil and Pernik districts are of great importance for the economic development of the area.

The functioning of the labor market and the formation of the workforce, its demand and supply, are influenced by the demographic situation, which is characterized by low birth rates, high death rates, aging of the population, intensive emigration processes, low employment levels, etc. Population aging, the declining employment rates and the emigration to other parts of the country and abroad, are all processes with profound effect on the economy, the labor market and the social system in the studied area.

The topic related to the demographic development and the functioning of the labor market in Bulgaria (including in rural areas) has been discussed in a number of scientific publications by various authors [1], [2], [3], [4], [5], [6], [7], [8], [9].

The object of the current study are the rural areas of the administrative districts of Blagoevgrad, Kyustendil and Pernik, which combined occupy 9323.6 sq.km or 46.5% of the South-West region of the country (NUTS 2) (Figure 1). As of 2017, 292 418 people lived in those three districts, which represented 13.8% of the total population of the South-West region. Rural areas (municipalities) in the districts of Blagoevgrad, Kyustendil and Pernik include 508 settlements, of which 19 are urban and 489 are rural.

The purpose of this study is to highlight the changes in the rural demographic development of the designated area during the 2011-2017 period and to draw conclusions on the impact demographic development has on the labor market.

Fig.1. Rural areas in Blagoevgrad, Kyustendil and Pernik districts

RESEARCH METHODS AND DATA SOURCES

The paper examines the rural areas in the districts of Blagoevgrad, Kyustendil and Pernik, which include municipalities that meet the criteria for rural areas listed in Ordinance No. 14/01. 04. 2003 of the Ministry of Agriculture and Forestry and the Ministry of Regional Development. According to the above-mentioned Ordinance, of a total of 29 municipalities (LAU1) in the districts of Blagoevgrad, Kyustendil and Pernik, 25 are designated as rural areas, which are as follows:

- ✓ **in Blagoevgrad district** - Bansko, Belitsa, GotseDelchev, Garmen, Kresna, Petrich, Razlog, Sandanski, Satovcha, Simitli, Strumyani, Hadzhidimovo and Yakoruda;
- ✓ **in Kyustendil district** - BobovDol, Boboshevo, Kocherinovo, Nevestino, Rila, SaparevaBanya and Treklyano;
- ✓ **in Pernik district** - Breznik, Zemen, Kovachevtsi, Radomir and Tran.

The municipalities of the district centers (Blagoevgrad, Kyustendil and Pernik), as well as the municipality of Dupnitsa, are excluded from the scope of rural areas in the studied area. These data are used in cases where it is necessary to compare the existing differences between rural municipalities on the one hand and municipalities outside the rural areas (urbanmunicipalities) on the other.

For the purposes of the study, official data for the population provided by the National Statistical Institute (NSI) of Bulgaria for the period 2011-2018 have been used. On this basis, the main characteristic elements of the demographic situation of rural areas have been analyzed, including: number and distribution of the population, crude birth rate, crude mortality rate, natural growth rate, net migration rate and age structure of the population.

The following methods have been applied in the study: comparative geographical analysis, cartographic methods using GIS for spatial analysis and visualization, mathematical and statistical methods, various graphical methods for visualization of the obtained results - graphs and tables.

DEMOGRAPHIC CHARACTERISTICS

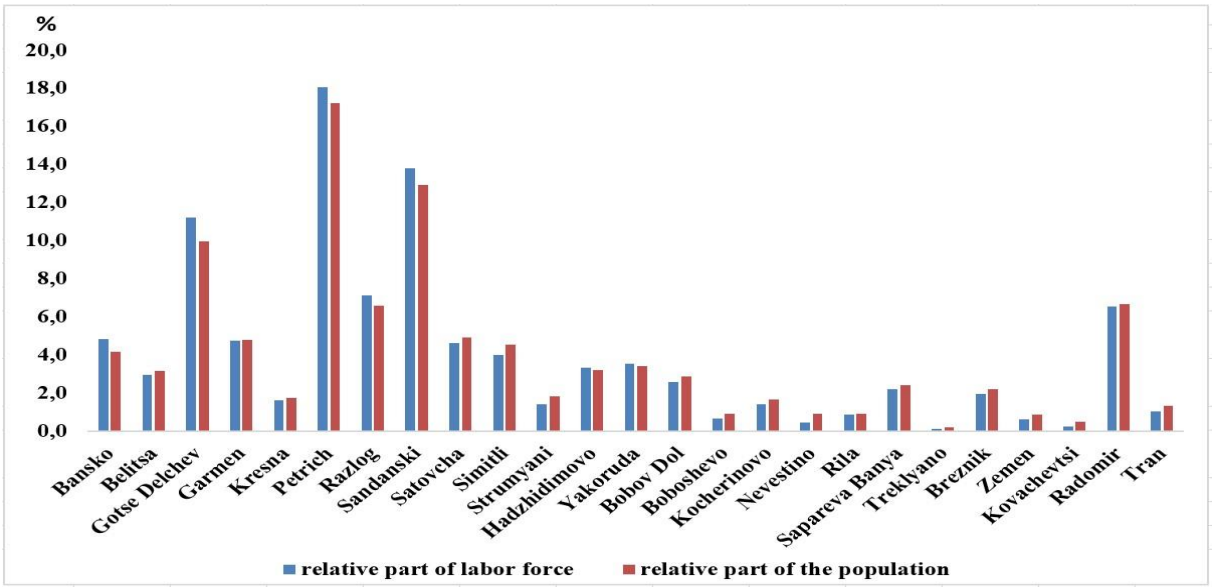
Population number and distribution

The changes in rural population affect different areas of social life in the discussed area, including future demographic development and reproduction. Each demographic event reflects on the

population, while in the same time every change in the population affects the demographic processes themselves. As the population of individual municipalities increases (decreases), the potential for their overall future development increases (decreases). Demographic changes are economically important because they determine the increase or decrease of the workforce.

According to official statistical data for the studied period, in the rural areas of Blagoevgrad, Kyustendil and Pernik districts, certain negative demographic changes are observed, related to population decline (6.7%) and labor force (51.4%) as a result of both natural and migration-based decrease. The population dynamics show a sustained downward trend in almost all municipalities of the region. The only exceptions are Kovachevtsi and Treklyano, which have seen an increase ofthe population number during the discussed period. The population of the municipalities of Garmen, Bansko, Kresna, Tran, GotseDelchev and Razlog exhibit the least population decrease. The reasons for this are of different nature - ethno-religious composition of the population, economic, social, etc. A significant decline of the population number was registered in the municipalities of Nevestino (by 733), Bobovdol (by1342), Kocherinovo (by724), Rila (by365) and Zemen (by330), leading to depopulation of a number of settlements in these municipalities, such as Rayantsi, SmirovDol, Odranitsa, Rakovo, Vetren and some others.

Fig. 2. Shareoftheworkforce and the total populationintheruralareas of the total population in Blagoevgrad, KyustendilandPernikdistricts as of 01.Feb.2011 (%)



The rural population of the studied districts is unevenly distributed. According to the last census of February 2011, the most populous municipalities were Petrich (54 006 people), Sandanski(40 470 people), GotseDelchev (31 236 people), Razlog (20 598 people) and Radomir (20 896 g.), which all form 53.4% of the population and 56.7% of the economically active rural population of the studied area (Fig. 2). This can be explained by the fact that their urban centers are relatively better developed in socio-economic aspect. The least populated municipalities are the ones of Boboshevo, Nevestino, Treklyano, Zemen and Kovachevtsi, accounting for 3.4% of the population and just 2.1% of the rural workforce in the discussed districts. In those municipalities, the socio-economic conditions of life are highly unfavorable, which results in emigration and low share of the workforce.

The formation of the workforce is a process that is directly dependent on the development trends of both the natural and the migration growth.

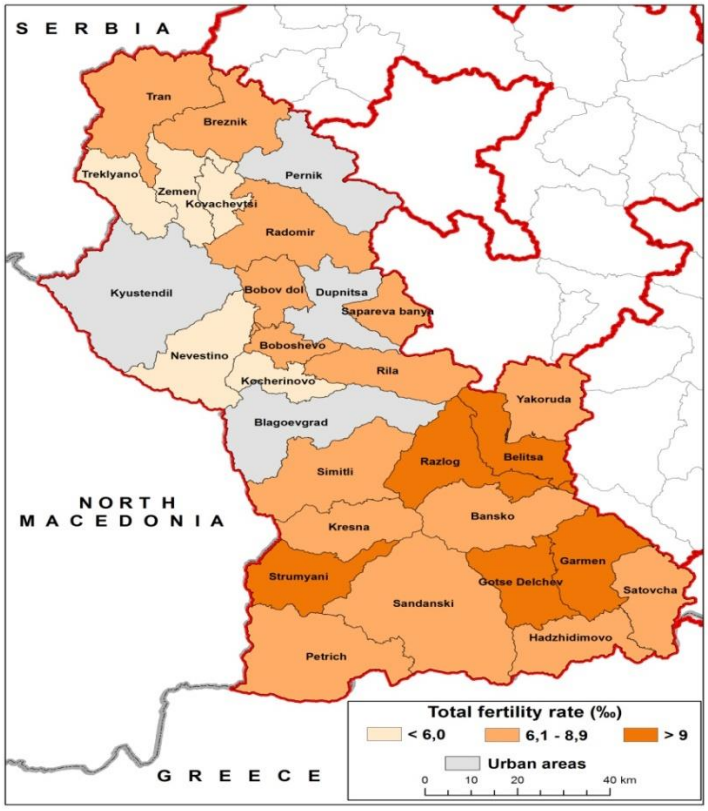
Crude birth rate of the population

The crude birth rate is a basic component of the natural reproduction of the population. Based on its levels and dynamics, one can assess the demographic picture and the state of the rural labor market in the districts of Blagoevgrad, Kyustendil and Pernik.

During the 2011-2017 period the birth rates among the rural population of the districts in discussion was in the range of 2.9 ‰ - 11.5 ‰, following the general trend of the country's rural population, but with values lower than both the national average (9.3 ‰) and the South-West region average (9.6 ‰). No significant differences in the level of birth rates are observed between rural and the urban municipalities (Blagoevgrad, Kyustendil, Dupnitsa and Pernik).

The dynamics of the birth rate affects the formation of workorce in the future. The population decline by 6.7% combined with low birth rates (8.6 ‰) means that the number of workforce will continue to decline. The municipalities ofGarmen (11.5 ‰), Belitsa (10.4 ‰), GotseDelchev (9.9 ‰) and Razlog (9.6 ‰) stand out with the highest capacity for future labor potential and the highest levels of birth rates in the area (Figure 3). The main reasons for that are the ethno-religious characteristics of the population and the related reproductive behavior of the local population. Despite the higher than the average birth rates during the studied period, the municipalities of Belitsa and Garmen exhibit a decrease in the level of that indicator in 2017 compared to 2011.

Fig. 3. Crude birth rate in the rural areas of Blagoevgrad, Kyustendil and Pernik districts for the 2011-2017 period (‰)



According to Ilieva (2012), the birth rate decrease indicates change of values and reproductive attitudes of the local population of Bulgarian Muslimsand ethnic Turks. The municipalities which exhibit the least demographic potential in the studied area are Nevestino (birth rate of 2.9 ‰), Treklyano (4.4 ‰), Zemen (5, 3 ‰), Kocherinovo (6.2 ‰), Kovachevtsi (6.2 ‰) and BobovDol (6.2 ‰). The extremely lowbirth rates in that case are due to the highly deteriorated age structure of the population, low incomes, economic uncertainty, etc.

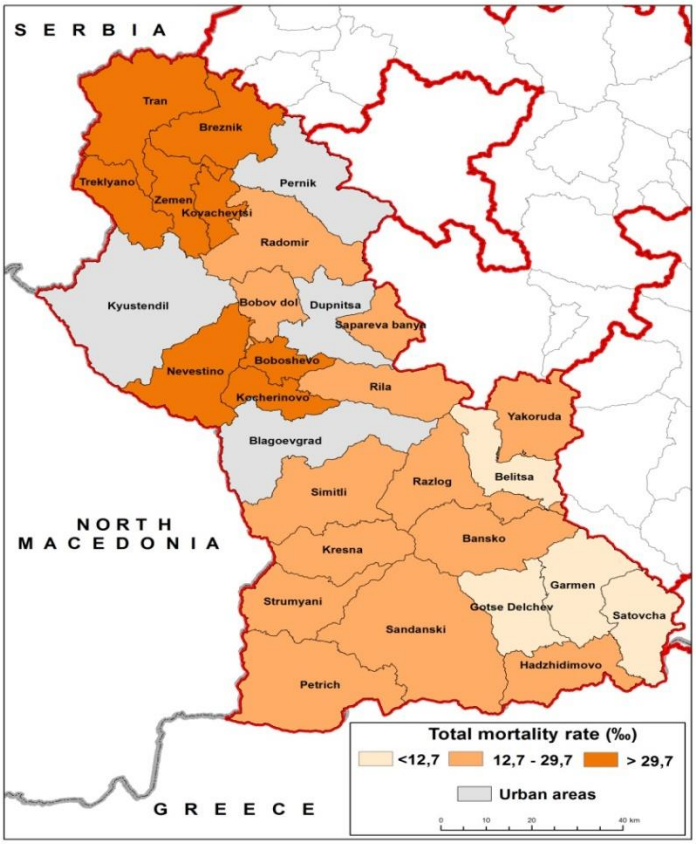
Mortality and crude death rate of the population

The increasing mortality rate significantly affects the formation of workforce, and hence - the functioning of the labor market in the rural areas of the studied districts. Mortality is a major demographic process as well as one of the most important indicators for population analysis, along with the analysis of birth rates. Mortality is directly dependent on the age structure of the population, but the age differences in mortality itself are the result of the influence of many factors such as incidence, standard of living, health care development level, health culture and dietary habits of the population, etc.

During the 2011-2017period, the crude death rate of the population in the studied area, with small fluctuations, exhibited an upward trend. The level of the indicator for the rural population was

several points higher (16.1 ‰) compared to the South-West region's average (13.4 ‰). The observed differences indicate unfavorable trends in the development of the rural population in the area, similar to the country as a whole, despite the presence of a number of municipalities with relatively good levels of the discussed indicator. The higher death rate reflects not only the economic development level and employment, but also the state of medical care and the deteriorating age structure of the rural population in the studied area.
The overall death rate of rural residents varies widely - between 9.7 ‰ and 46.9 ‰. The highest death rates are observed in the municipalities of Treklyano (46.9 ‰), Nevestino (46.7 ‰), Kovachevtsi (43.8 ‰), Breznik (36.8 ‰), Zemen (35 ‰), Boboshevo (31, 6 ‰), Tran (30 ‰), Kocherinovo (29.7 ‰), etc. (Fig. 4).

Fig. 4. Crude death rate in the rural areas of Blagoevgrad, Kyustendil and Pernik districts for the 2011-2017 period (‰)



The main reason for that is the aging of the population and the low standard of living and health care. The lowest death rates on the other hand are observed in the municipalities of younger age structure of the population, such as Garmen (9.7 ‰), Satovcha (10.4 ‰), GotseDelchev(11.4 ‰), Belitsa (11.8 ‰) and Yakoruda (12.7 ‰). It is disturbing that at the end of the 2011-2017 period, an increase of the death rate was observed in a total of 19 of the studied municipalities. According to Ravnachka (2016), these changes should be taken into consideration when implementing district

and municipal policies in the social and healthcare spheres. Otherwise, the economy and the labor market in particular, are about to face a large-scale workforce shortage**.**

Natural growth of the population

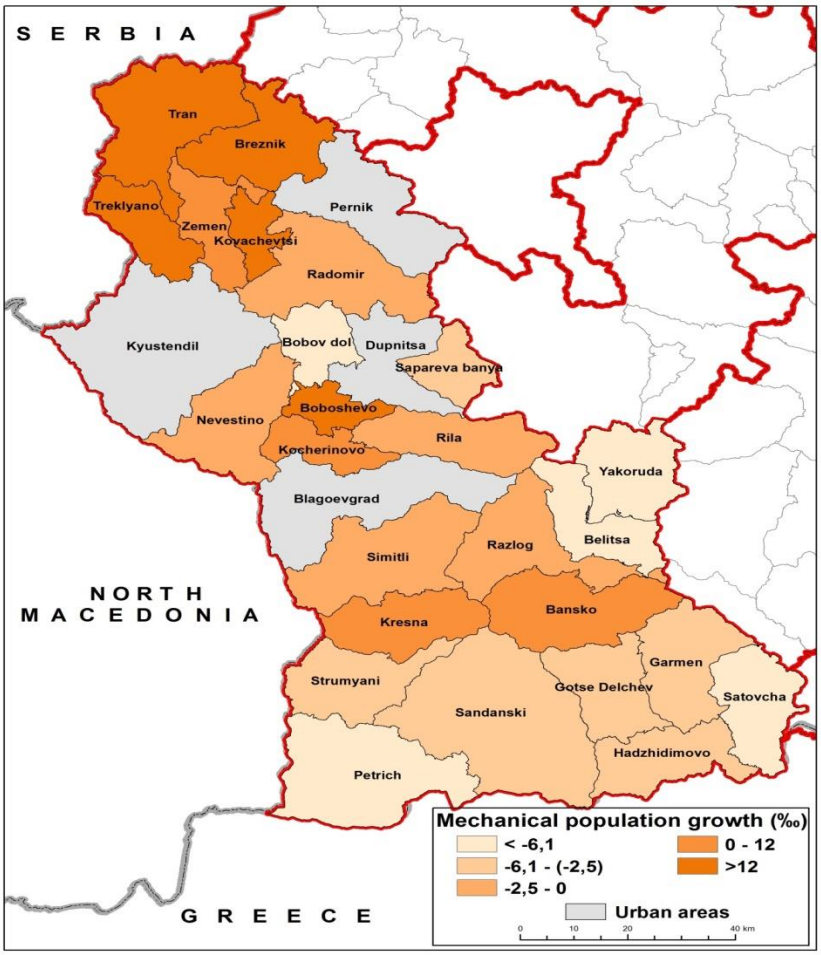
The *negative natural growth* or the *natural decrease* of the population is the result of a rapid decline in fertility and maintaining a high mortality rate of the rural population in the studied area. It is the natural decrease and not the negative net migration rate that has theleading role in the reduction of the population and the workforce not only in the studied area but in the country as a whole.

In the rural areas of the three districts in discussion, the natural decrease rate was higher (-7.6 ‰) than both the national average (-5.8%) and that of the South-West region (-3.8 ‰) during the 2011-2017 period. Significant differences are observed between rural municipalities and non-rural municipalities - the natural decrease of the population (-6.6 ‰) in the urban municipalities (Blagoevgrad, Kyustendil, Dupnitsa and Pernik) is lower than that of the rural areas. In spatial terms, only the municipality of Garmenregistered positive levels of natural growth (1.8 ‰), due to the higher birth rates there. With more favorable values of the indicator, though still negative, are the municipalities which exhibit specific ethno-cultural features, such as Belitsa (-1.3 ‰), GotseDelchev (-1.4 ‰), Satovcha (-2.3 ‰), Yakoruda (-3.9 ‰), as well as Petrich (-4,1 ‰), Sandanski (-4,6 ‰) and Razlog (-4,7 ‰). This is a result of the relatively higher birth rates and lower mortality rates due to the more favorable age structure of the population in these municipalities. In the 2011-2017 period, the municipalities with the highest values of natural decrease were the municipalities of Nevestino (-43.9 ‰), Treklyano (-42.6 ‰), Kovachevtsi (-37.6 ‰), Breznik (-30.5 ‰), Zemen (-29.8 ‰), Boboshevo (-25.3 ‰), Kocherinovo (-23.6 ‰) and Tran (-22.7 ‰). The main reason for this is the highly deteriorated age structure and the staggering proportions of population aging in those municipalities.

Migration and net migration rate

Together with the natural movement (reproduction) of the population, migration is the other determining factor for the overall development of the rural population in the districts of Blagoevgrad, Kyustendil and Pernik. Migration not only influences the direction and pace of population change, but also increases the disparities between demand and supply of workforce on the labor market. During the 2011-2017 survey period, the rural areas of the three districts were characterized by negative net migration rate and a declining trend in the number of migrations as a whole.

Fig.5. Net migration rate in the rural areas of Blagoevgrad, Kyustendil and Pernik districts for the 2011-2017 period (‰)



Nine municipalities (Treklyano, Kovachevtsi, Tran, Breznik, Boboshevo, Zemen, Kresna, Bansko, Kocherinovo) registered positive net migration rateduring the observed period. This is mostly because of the decreasing number of emigrants due to *migration depletion*. The demographic situation in the rural areas is characterized by a declining population number, low birth rates, high mortality rates, aging population and depopulation of a number of settlements, which all play a limiting factor for migration processes, namely – reduction of the number of potential migrants.

In the 2011-2017 period, a total of 16 municipalities observed negative net migration rate - Satovcha (-8.3 ‰), BobovDol (-8 ‰), Petrich (-6.8 ‰), Yakoruda (-6.3), Belitsa (-6.1 ‰), etc. The reasons for this are complex, but among them are the closure of mining activities in BobovDol for example, the low level of development of the service sector, the overall economic backwardness of these municipalities, which eventually lead to increased unemployment and, in general, a deterioration of the living standard. The established trend of increased migration of the population towards economically more stable parts of Bulgaria (cities located in the areas of influence of Sofia, Plovdiv, Burgas, the Black Sea coast, etc.) or abroad, will lead in the future to unfavorable trends in the demographic development of the studied municipalities, with continuing decline in population number and hence – in the number of the workforce itself.

Agestructure of the population

The state of the agestructure reflects the demographic and socio-economic development of both the country and ruralar easin the districts of Blagoevgrad, Kyustendiland Pernik over the last 30 years. The age structure defines the workforce in each rural municipality of the studied districts. Usually municipalities with a younger age structure have higher workforce potential in the long run, while municipalities with a deteriorated age structure generally exhibit a limited demographic and work force potential respectively.

As of 2017, the ruralar easin the districts of Kyustendiland Pernik exhibit an extremely high proportion of the population above working ageand a low proportion of people of under working age compared to rural are asin Blagoevgrad district and the countryas a whole (Table 1). The increased share of population above working age will lead to a significant reduction of the workforce, thus limiting labor supply to local labormarkets.

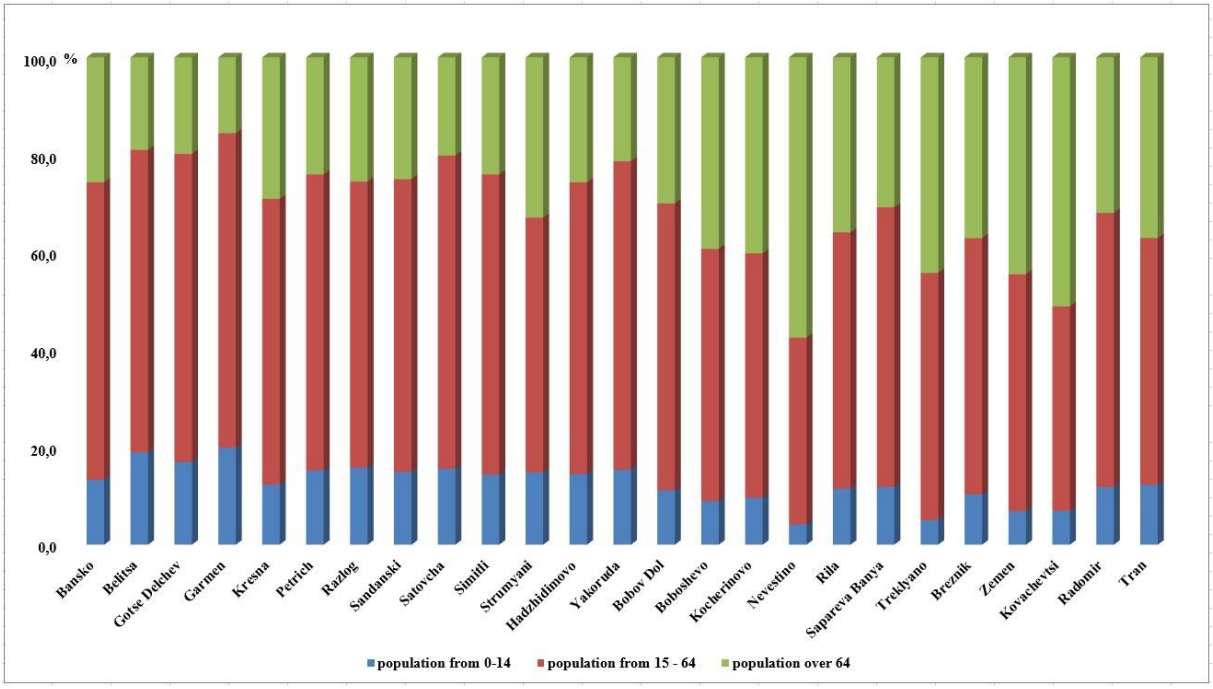
Table 1. Share of under working age, working age and above working age population as of 2017 in the rural areas of Blagoevgrad, Kyustendil and Pernik districts (% of the total population)

Regions	**Under working age (%)**	**Working age (%)**	**Above working age (%)**
Bulgaria total	15,1	60,3	24,6
Rural areas of Blagoevgrad district	15,7	61,2	23,1
Rural areas of Kyustendil district	10,2	54,0	35,9
Rural areas of Pernik district	11,0	53,6	35,4
Urban municipalities in the studied area	14,8	60,7	24,5

Source: NSI data

The spatial differences in the age structure of the rural population in the studied districts are due to past migrations and changes in the mode of population reproduction in the different rural municipalities. (Fig.6).

Fig.7.Age structure of the rural population in Blagoevgrad, Kyustendil and Pernik districts as of 2017 *(%)*



Source: NSI data

Population aging is most severe in the municipalities of Nevestino, Kovachevtsi, Zemen, Treklyano, Kocherinovo and Boboshevo. The municipalities of Nevestino and Kovachevtsi form an area of deep depopulation and highly deteriorated age structure. The share of population under working age only constitutes 4.2-5.0% of the total, while the working age population accounts for 51.1-57.5 %. The reason for this is the extremely low birth rates combined with emigration and economic crisis following the socio-political changes in the country of 1989. Better opportunities for maintaining their workforce resources in the coming years are exhibited in the municipalities of Garmen, Belitsa, GotseDelchev, Satovcha and Yakoruda. The specifics of the natural reproduction due to ethno-cultural and religious features of the local population is the main reason for these municipalities to have a higher share of the working age population than other rural municipalities in the area.

The current age structure of the population in the rural areas of the studied districts is a typical feature of the demographic crisis and creates problems of socio-economic nature. In the future, the age structure of the rural population in the studied area will influence the quantity of the workforce and its supply on the local labor markets.

CONCLUSION

The following conclusions can be drawn from the analysis of the demographic indicators in the rural areas of Blagoevgrad, Kyustendil and Pernik districts for the 2011–2017 period:

Birth rates are low due to the deteriorated age structure of the population, especially in the municipalities of Nevestino, Treklyano, Zemen, Kocherinovo, Kovachevtsi and Bobov Dol.

However, in the municipalities of Garmen, Belitsa, GotseDelchev and Razlog birth rates are relatively better because of the ethno-religious specifics of a part of their population resulting in certain reproductive behavior;

Mortality shows an upward trend, most distinct in the rural municipalities of Treklyano, Nevestino, Kovachevtsi, Breznik, Zemen, Boboshevo, Tran and Kocherinovo. The reason for this is the very old population residing in the villages of these municipalities, many of which are at risk of total depopulation;

The natural growth of the population in the municipalities of Belitsa, GotseDelchev, Satovcha and Yakoruda is either slightly negative (natural decrease) or slightly positive (Garmen municipality), though low. The values of natural decrease of the population in municipalities such as Nevestino, Treklyano and Kovachevtsi are striking. This is due to their rather exhausted demographic potential.

During the surveyed period between 2011 and 2017, the municipalities of Treklyano, Kovachevtsi, Tran, Breznik, Boboshevo, Zemen, Kresna, Bansko and Kocherinovo exhibited positive net migration rate due to the so-called "migration depletion", while the remaining 16 municipalities were dominated by negative net migration, which will continue to worsen their demographic situation.

The worsening demographic situation of the rural areas in the districts of Kyustendil and Pernik leads to a decrease in the share of the population under working age and to an increase of the relative share of the population above working age.

The above-mentioned spatial demographic differences allow us to conclude that the state of the human resources of the rural municipalities in the districts of Blagoevgrad, Kyustendil and Pernik is of particular importance for the construction of a well-functioning labor market. The outlined trends of declining and aging population will continue in the future and will undoubtedly affect the number of children, the contingent of working population and, respectively, the quantity of the workforce, as well as its supply on the local labor markets. In municipalities with better crude birth and natural growth rates, the workforce may increase in the long run, while in the municipalities of low birth rates and high natural decrease of the population, the workforce will continue to decrease as population aging becomes more and more extreme. The significant differences in the level of demographic indicators between the different rural municipalities require the implementation of measures which are specific for each municipality, depending on the level of natural growth, net migration rate and the workforce potential.

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THE ROLE OF TRANSFER FOR THE KNOWLEDGE FOR BIOECONOMIC DEVELOPMENT IN BULGARIA

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ABSTRACT

The aim of the paper is to show the relationship among the sustainable knowledge for bioeconomy from scientific organizations/advisors to farmers. To analyse whether the policy has intervention for the cooperation and knowledge transfer for the future bioeconomical development, it should investigate the main actors, network structures among different actors and the relations among advisors and beneficiaries. By using descriptive statistics, it will be evaluated the results from interviews conducted with farmers. The study shows that there are different approaches and demands for knowledge transfers. The most of interviewed actors have responded positively about the effects of knowledge transfer for the concept „bioeconmy". The expectation is that the specific knowledge and information for bioeconomy may impact the farms grow over time and completely change their approach to production and their sustainable development.
Key words: *transfer of knowledge, information, bioeconomy, farms, Bulgaria*

INTRODUCTION

The bioeconomy in Bulgaria is a new approach for solving the problems of population by integrating available natural and labor resources, production facilities, the innovated technologies related to the production of new goods. The conversion of production for achieving sustainable development in the field of production and consumption, stable economic development and growth living standards of the population, it is important to protect the environment and resources. The concept of the bioeconomy in the EU is also label "knowledge-based bioeconomy" (Schmidt, O., at al, 2012). The label "knowledge-based" was in line with the EU innovation policy that prevailed at the time. According to Birner, R. (2018), the concept of the knowledge-based economy reflects the vision of achieving economic growth through high-technology industries, which requires investments in innovation and highly skilled labor.

The main purpose of introduction of bioeconomy is to maximize all organic and raw materials obtained from agricultural production, forestry, fish farming, aquaculture, industry and through the achievements of innovative biotechnology and nanotechnology their transformation in byproducts for final consumption (McCormick, K. et al. 2013, Adamowicz, M, 2017). The main task of the bioeconomy is to achieve sustainable development in agricultural sector, forestry, industry, energy, improvement of market realization, increasing the employment of the population, increasing the competitiveness of the economy. An essential role in achieving the mission and the goals of the bioeconomy play the active involvement of science and the application of innovative achievements in the processes of production and transformation of production, the use of biotechnology related to the participation of microorganisms, advances in genetics to increase productivity, adaptability, sustainability of plants and animals in the agricultural sector, improving

the quality and nutritional value of the products received and the diversification of the range of manufactured products, the introduction of specific regional, branded and boutique (BIA, 2017).

The aim of the paper is to show the relationship among the sustainable knowledge for bioeconomy from scientific organizations/advisors to farmers. To analyse whether the policy has intervention for the cooperation and knowledge transfer for the future bioeconomical development, it should investigate the main actors, network structures among different actors and the relations among advisors and beneficiaries. By using descriptive statistics, it will be evaluated the results from interviews conducted with farmers. While from a traditional perspective the farms have a weak development because of the lack of adequate knowledge exchange, their isolation seems difficult to knowledge diffusion from an expert point of view. However, this might only hold for the diffusion of new techno-economic knowledge.

MATERIALS AND METHODS

The main purpose of this study is to analyse the transfer knowledge and information related to bio-economical approach to farmers. The main instances of knowledge transfer are related to bioeconomy, the problems of population by integrating available natural and labor resources, production facilities, the innovated technologies, the livestock breeding sector as well as in relation to participation in the next program period 2020-2027. According to Sarov, A. and Tsvyatkova, D. (2019), they explain the need for bioeconomic knowledge and the support of economic growth to more resource efficient use. Also, it will increase the farmers' knowledge base for understanding the specific areas of bioeconomy.

In the present study, 80 farmers were interviewed. The selection of farmers consists of different size of farms. A list of farmers was provided by the Scientific Institutes and the Agricultural University. The farmers were selected randomly and interviews with them were performed in the field and over the phone/emails. The selection criteria for choosing farmers, with whom to carry out the interviews, are to have representatives from farm groups with different crop production, animal husbandry production, or both.

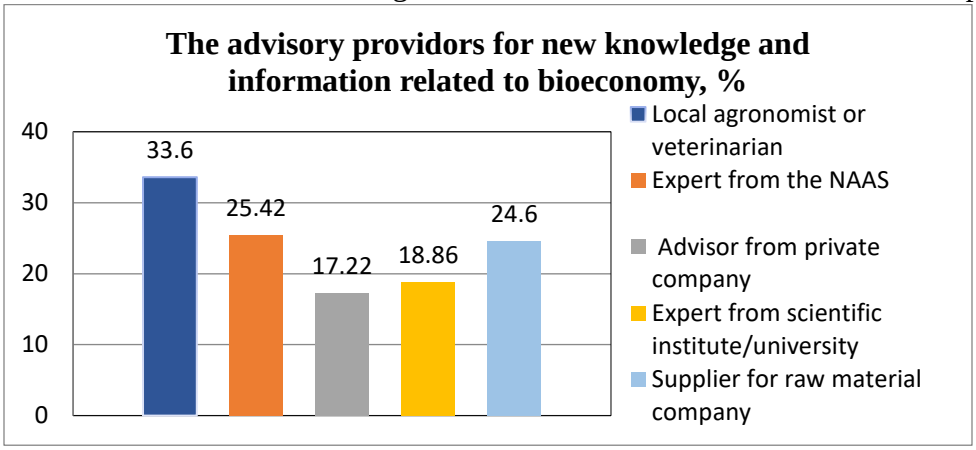
The developed questionnaires incorporated closed questions to understand how the knowledge transfer process works in practice and what is the demand of information related to new technologies, innovations and programs. Special attention was paid of the experts who spread new knowledge: local agronomists or veterinarian specialists, state experts from the National Agricultural Advisory Services, advisors from private companies, experts from scientific institutes and/or universities and suppliers from raw material companies. In the open questions were discussed the problems related to knowledge transfer as well as recommendations for improving the cooperation between science and agribusiness.

RESULTS AND DISCUSSIONS

During the study, the interviews were carried out with farmers who highlighted problems in their operations and the type of knowledge and innovation related to bioeconomy. The farmers shared their opinions on how to receive support and knowledge among scientific centres, advisory services and state administration. To increase farmers' abilities, they receive knowledge and

information through different channels: formal education from organized seminars, expert advices for implementation of new technologies and participation in rural development programs/seminars.

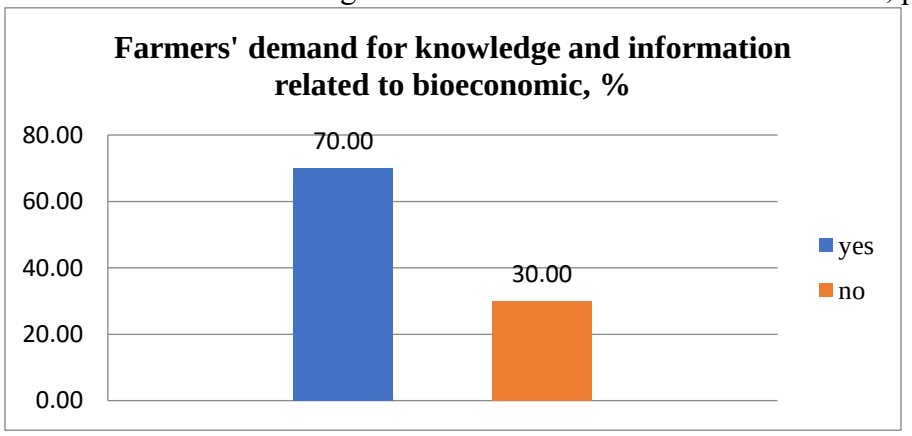
Figure 1. The methods for knowledge and information related to bioeconomics, percentage



In the figure 1, different providers for supplying knowledge and information for bioeconomy such as local agronomist/veterinarian, expert from the National Advisory Agricultural Services, advisor from private company, expert from scientific institute/university, supplier from raw material company are presented. The results show that the main provider of knowledge to the farmers are local specialists (agronomists or veterinarian) and then follow the state or private advisors. On the other side, around 70% of the farmers (figure 2) have interest and demand for the new knowledge and information, especially for the new concept for bioeconomy, which may affect their economical growth through implementing high-technologies and making investments in innovation. Mainly farmers expect to receive full support for their future investments through well-organized seminars/forums and participation in programs (figure 3).

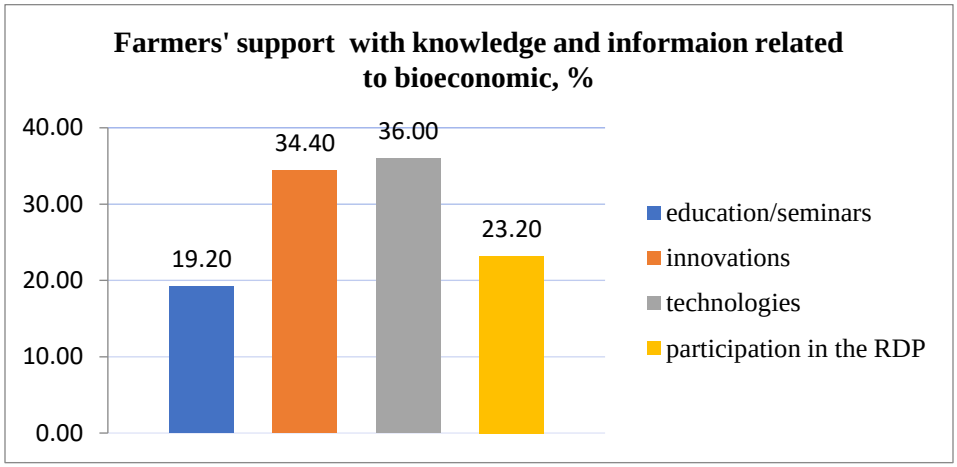
The knowledge need to be effectively connected to the different mechanisms that meet the farmers' needs. The results of our study show that the involvement of all actors at an early stage will be important for the rapid dissemination of knowledge related to the bioeconomy. For this purpose, there must be several stages that actors must go through:

Figure 2. Farmers' demand for knowledge and information related to bioeconomic, percentage



The first stage is *education*, as a form in which knowledge related to the bioeconomy can be most effectively disseminated. This means access to quality biotechnological knowledge designed to contribute to the development of environmentally sustainable technologies. In order to make the change to a sustainable production and processing system more efficient, the level of financial support for research in the bioeconomy must be increased through multidisciplinary programs. The work among farmers and scientific organizations, also, may help to overcome barriers and gaps in knowledge. The channels for knowledge transfer are universities, research institutes, state and private advisors. Bulgaria needs high-qualitative research to generate new knowledge that will help the deal with the environment and production. In universities, young people should be engaged to economic disciplines in which will be included knowledge base and understanding of specific areas of the bioeconomy.

Figure 3. Farers' support with The methods for knowledge and information related to bioeconomic, percentage



The second stage, *communication* and active involvement of actors are needed. For this purpose, the relation among scientific organizations, universities, state and private advisors and innovation agents with farmers should be built on high trust and well-established relationships. This can help the raise of consciousness of bio-technology and ensure that long-term goals.

The third step is *training* as the important measures that can be taken as a bridge between scientific knowledge and the practice. All educational, scientific and advisory organizations should provide agrobusiness support for the bioeconomic sector through the implementation many international and state directives, regulations and standards. For the success of the farms, all knowledge and information providers need to improve their communication, establish the necessary priorities in their activities, and search for tools for transfer of knowledge, good practices and disseminations.

To occur these three stages, the relation among actors are important for building trust and strong links between scientific organizations, advisories and agribusiness companies through innovative clusters or knowledge dissemination centres. Especially, the support for small farms should be built. Bulgaria needs to exploit and transform its economy into environmentally

sustainable and socially comprehensive development. The future expectation is that the specific knowledge and information for bioeconomy may impact the farms grow over time and completely change their approach to production and their sustainable development.

CONCLUSIONS

The previous experience in Bulgaria shows how important is the need of transfer of knowledge and information for supporting the development of the new concept of bioeconomy. Therefore, greater awareness of farmers creates an opportunity to build more innovative production. This can be supported by the creation of educational or business forums in which different sectors can meet and exchange ideas, practices and information. Successful implementation of the bioeconomy can be happened with qualified experts who transfer knowledge and innovation to farmers through quality education, good communication and demonstration of good practices. The knowledge increased by famers in the field of bioeconomy can lead to the preservation of genetic potential, reducing the loss of biodiversity, and favoring the conservation of production capacity of agricultural systems.

ACKNOWLEDGMENT

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HOW DIFFERENT FARMING PATTERNS ARE CHANGING RURAL AREAS

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ABSTRACT

The purpose of the paper is to analyze and evaluate the impact of agricultural models on rural development and to offer opportunities for the development of agricultural models. The changes in agricultural holdings and their effects on the socio-economic and environmental characteristics of rural areas are the subject of the study. The rural areas within the territory of two planning regions (NUTS2) are the object of the study. The survey is based on statistical information for the period 2007-2018 and expert evaluation of specialists in agriculture and territorial development in the South Central Planning region and North East region (2019). 52 experts from nine Bulgarian districts were involved in the survey. They work in the municipal and district directorates "Agriculture" and the National agricultural advisory service.
The results presented in the publication are part of the project № 15/8 of 2017 "Sustainable multifunctional Rural Areas: Rethinking Agricultural Models and Systems in the face of increased requirements and scarce resources", funded by the Scientific Research Fund.

KEY WORDS: models of agriculture, Southern and Northern model of agriculture, rural development

INTRODUCTION

The last thirty years have seen significant and continuous changes in the development of Bulgarian agriculture. After the land and agrarian reforms at the end of the last century, the Common agricultural policy and the socio-economic development of rural areas became drivers of the changes in rural development.

The interaction between agriculture and rural areas (nature, territory) is the subject of research interest by various experts. Moreover, if the representatives of natural and technical sciences continue their search in the direction of what kind of agriculture to be develop in order to make optimal use of natural potential within the specific climatic conditions, then ecologists, landscape architects, economists, sociologists and others are increasingly studying and develop the opportunities for development of a agricultural model, providing favorable impacts for the rural territory, natural resources, incomes of the people living in rural areas, quality of life, environmental characteristics, etc.

There are problems in the intensive agricultural areas and disadvantaged areas due to the rapid concentration of agricultural production and the growing polarization of agricultural structures (EC, 2010; EC, 2011). The rural development is also influenced by the climate change and the change of impact of agriculture on rural areas (Reidsma et al, 2015)

The structural changes are from significant importance for achieving more sustainable rural development. They could be related to promotion of more sustainable development, contribution to tackling social, environmental and economic imbalances and challenges. The transformation

and adaptability of the agricultural sector and rural economies have become key issues (Knickel et al, 2013; Peter, Knickel, 2016; Horlings, 2014). Agricultural sector in some countries influence positively on rural development, increase the incomes of the poor and is sources from which they earn their living (Corral et al, 2017).

Some authors consider there is a need for a new model for agricultural development (Ploeg et al, 2002). Production of high-quality products, short chains, organic farming, resource and landscape management, agritourism, improvement of the market infrastructure of agricultural holdings, expanding farmers' sources of income and diversifying the rural economy have to be the elements of this sustainable model. These key issues have been supported by the Common agricultural policy.

The EU's common agricultural policy has a major impact on production patterns. In a number of new acceding countries, it has contributed significantly to dramatic structural changes in agriculture, to a significant reduction in the number of animals and pasture use, to a reduction in the production and use of manure, to an increase in labor seasonality etc. As a result, unemployment and emigration increase, the chances of employment and government tax revenues decrease and all this predetermines the need of higher subsidies.

These processes are observing also in Bulgaria, where the restructuring processes are markedly dynamic. The number of farms decreased 2.45 times in 2016 compared to 2007, mostly at the expense of small farms. The specificity of Bulgarian agriculture is that the number of employees converted into annual work units (AWU) in the sector has been steadily declining since 2007. In 2016 their number was 50 % less than in 2007, but as a nominal number the employed reduced by only 8% (MAFF, 2018). This means that agriculture continues to perform social functions.

At the same time, the Common agricultural policy during the last two programming periods stimulates the development of the processes of greening the production, production of high quality products, diversification etc.

The purpose of the paper is to analyze and evaluate the impact of agricultural models on rural development and to offer opportunities for the development of agricultural models. The changes in agricultural holdings and their effects on the socio-economic and environmental characteristics of rural areas are the subject of the study.

MATERIAL AND METHODS

This study includes mixed quantitative and qualitative research design. The quantitative part presupposes the presentation and analysis of statistics on agriculture and rural development at the level of planning region in the period of EU membership (2007-2018). Qualitative methods include the use of the expert’s evaluation method and in-depth interviews with 52 specialists from regional office “Agriculture” and the regional office of the National agricultural advisory service in the South Central Planning Region (BG42) and Nord East region (BG33).

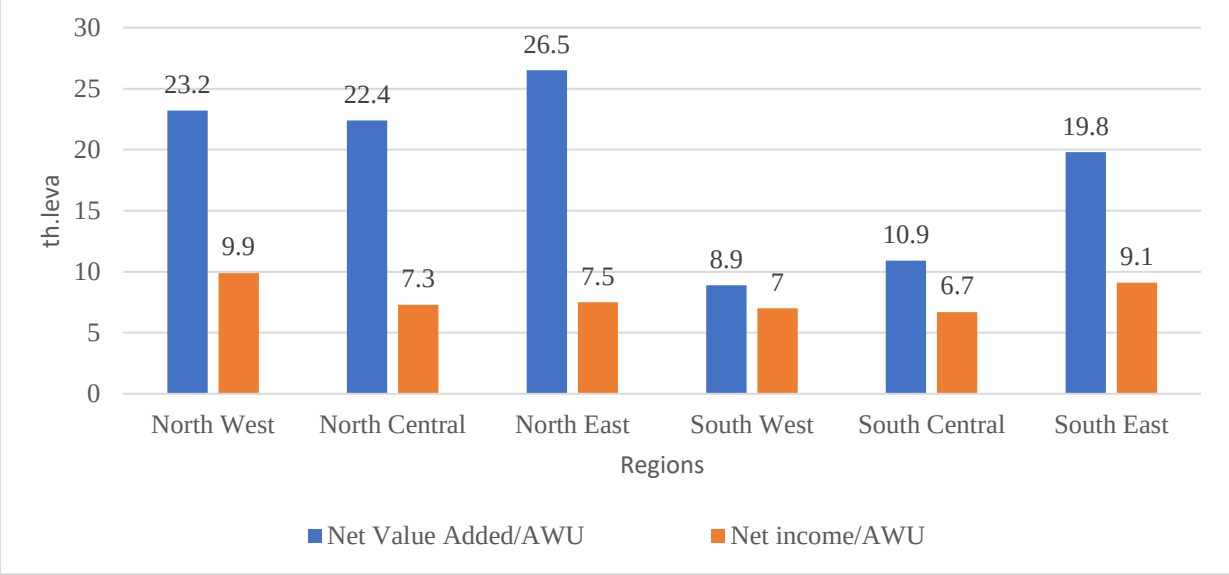
To assess the importance of agriculture for rural development and the trends in its development, the experts used a five-point positive Likert scale, in which 5 indicates complete agreement and 1 indicates complete disagreement with the assessed statement.

The object of study is two Bulgarian regions (NUTS-2), and the subject is the model of agriculture and its impact on the socio-economic and environmental characteristics of rural areas. A number of publications are devoted to these issues, (Doitchinova et al., 2016; Stoyanova, Harizanova-Bartos, 2019; Doitchinova et al., 2017; Doitchinova et al., 2019) which analyze the changes in the

characteristics and results of Bulgarian agriculture that have occurred over the last decade under the influence of the Common agricultural policy.

The regions are determined on the basis of the following effective indicators of agriculture by planning regions: gross added value and net income per annual work unit and unit area. Among the planning regions with the highest values according to the first indicator is the North East region, and in the last two places are the South West and South Central regions (Figure 1). Agriculture in these areas also has the lowest indicators of net income per annual work unit. Net income per unit area is twice higher in the South Central region (BGN 761 lv. / ha) compared to the North East region (BGN 328.8 lv. / ha), while the differences in added value per hectare are significantly smaller - respectively BGN 1239 lv. / ha and 1161.6 lv.

Fig. 1 Net income and Net added value of annual work unit (AWU)



Source: Ministry of Agriculture, Food and Forestry, Agrostatistic

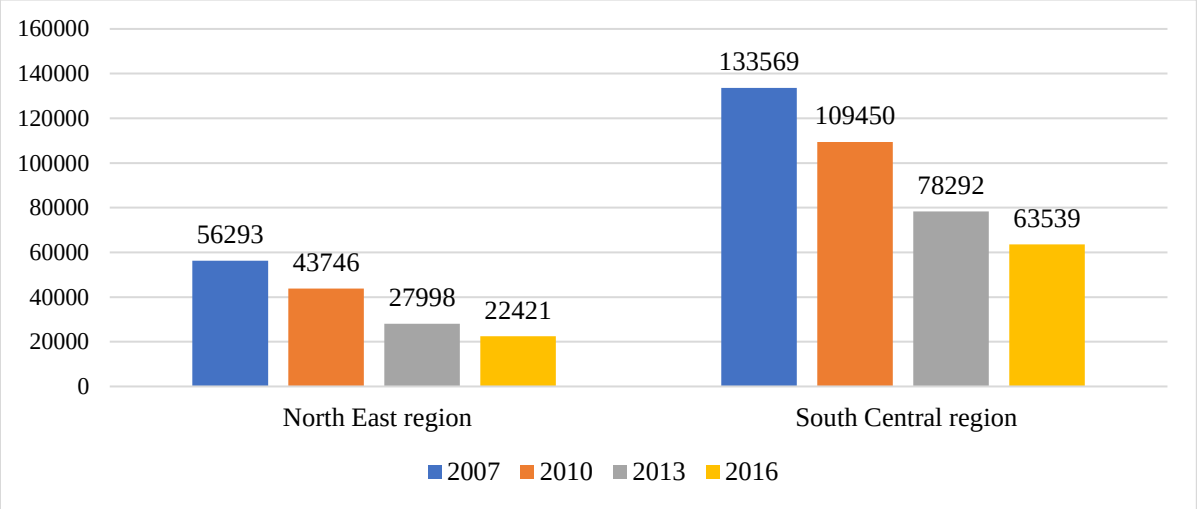
THE STUDY AREAS

The area of the South Central Region and Nord East Region is 33,46 % of the country's territory. In 2019, the population was 2335.4 thousand inhabitants (33,48 % of the total number in the country) living in 2037 settlements, organized in 86 municipalities and 9 districts.

The structure of agriculture in both regions is different. In both regions the relative share of cereals is the highest, but they are 59.81 % in the North East and 46.73% in the South Central regions. Oilseeds are on second place in both regions - respectively 29.83% and 25.17%. South Central region is a leader in vegetable production - with a relative share of 8.29% against 3.6% in the North East.

Continuous changes are observed in the average number and average size of agricultural holdings. During the period when our country is a member in the EU, the number of agricultural holdings has been constantly decreasing - 2.5 times in the North Eeast region and 1.78 times in the South Central region (Figure 2).

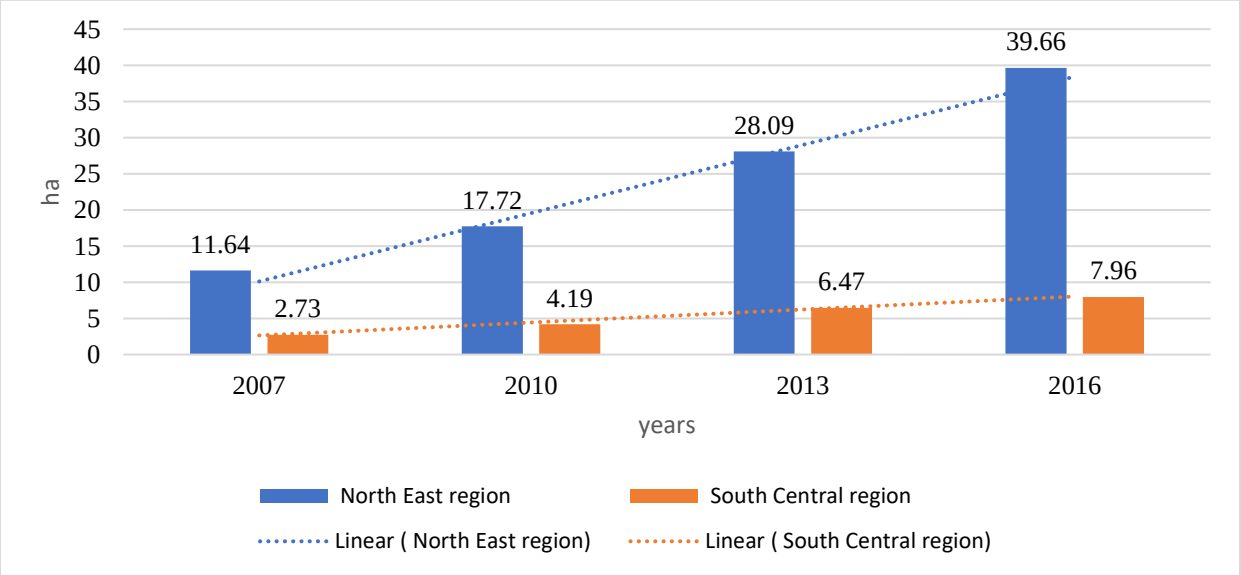
Fig. 2 Changes in the number of farms by region



Source: Ministry of Agriculture, Food and Forestry, Agrostatistic

There is a significant increase in the average size of utilized agricultural land per holding in both regions for the period 2007-2016. This increase is 3.4 times (from 11.64 to 39.66 ha) in the North East region and 2.9 in the South Central (from 2.73 to 7.96 ha). Despite these changes, the average size of an agricultural holding in the South Central region is in the penultimate place in the country. Differences in the average size of the used agricultural land are observed in all organizational forms. The most significant (over 3 times) are in sole traders and associations, followed by the holdings of individuals (2.54 times) (Figure 3). If the average size of a family farm in the North East region is 9.31 ha, then in the South Central region it is only 3.66 ha.

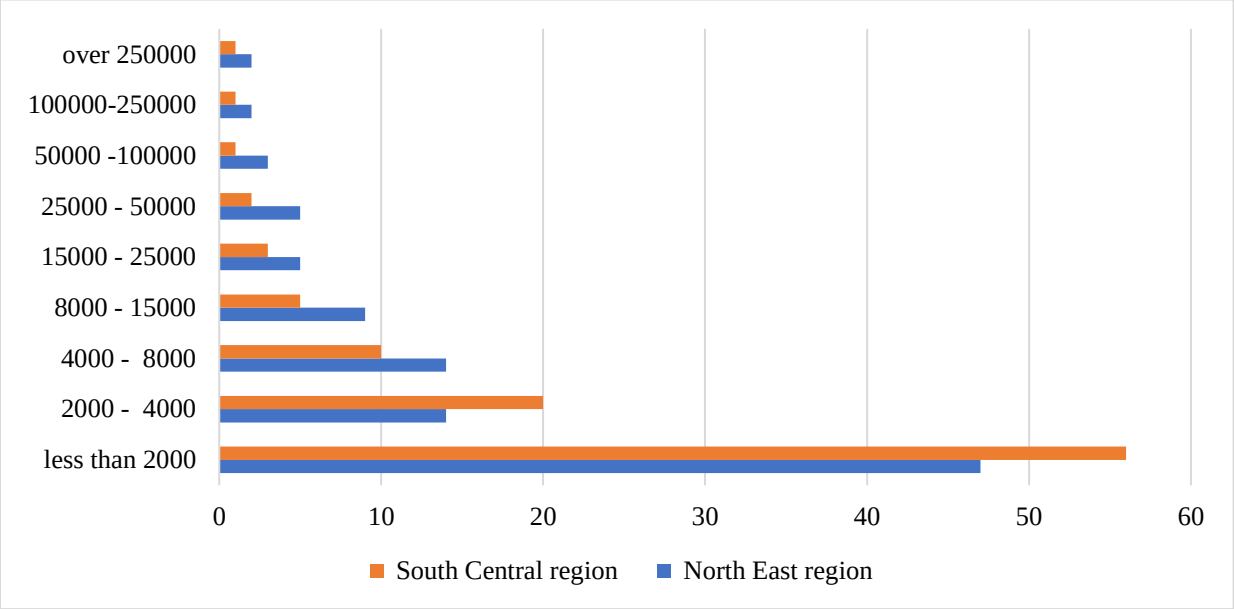
Fig. 3 Changes in the average size of utilized agricultural area



Source: Ministry of Agriculture, Food and Forestry, Agrostatistic

The structure of holdings by economic size (Figure 4) in South Central region shows the strong predominance of small holdings up to 2 economic units (56%) and between 2 and 4 economic units (20%). This data, together with the legal status information, shows the importance of family farming for the development of the South Central region. 40.23% of these farms consume more than 50% of the production, and 38.42% make direct sales.
Significantly lower is the presence of family farms (up to 2000 euros and from 2000 to 4000) in the North East region - respectively 47% and 14%. The importance of large-scale agriculture is higher. Agricultural holdings with an annual production volume of over 50 thousand euros are 7% of all holdings against 3% in the South Central region.

Fig. 4 Structure of holdings by economic size, 2016



Source: Ministry of Agriculture, Food and Forestry, Agrostatistic

RESULTS AND DISCUSSION

The differences between the characteristics and the development of agriculture in the studied areas are also supported by the assessment of the experts. The data in Table 1 shows that the importance of agriculture is highly valued in both regions, with a higher score in the North East region. The importance of agriculture to create jobs and income is also highly evaluated in this region. In 2018, 16.47% of the gross added value in the sector was produced on the territory of the North Eeast region, and 21.4% in the South Central region. At the same time, the relative share of agriculture in the gross added value in both regions are respectively 6.03 in North East and 5.87 in South Central, which is higher than the national average.
The biggest difference is between the assessments of the importance of agriculture for the state of the environment. In the South Central region, the score is 0.96 higher than in the North East.
The participation of farmers in cooperatives and non-governmental organizations is evaluated also extremely low from the respondents. In the South Central region, the assessments are lower than

2. These values are a result of reducing the number of production cooperatives in the region and the difficulties in establishing producer organizations.
Respondents in the South Central region evaluate high the statement that the proximity to large consumer centers stimulates direct sales (3.4 versus 3.29 in the North East region) and that farmers provide ecosystem services.
The lowest are the expert assessments of the question whether the specialization of the farms is suitable for the region and its conditions. In general, respondents from the South Central region evaluate high the statement that the production specialization of agricultural holdings is appropriate for the region.
The respondents consider that mixed and small and medium-sized farms predominate, and this is supported respectively from 68% and 72% of the respondents. In the North East region, 59% of respondents believe that specialized farms predominate, and 44% consider that mixed and small farms are more. Most of the experts (88%) consider that family farms with vegetables predominate.

Table 1. Experts evaluation of importance of agriculture

Statements and trends	North East region	South Central region	Difference
Importance of agriculture in rural areas	4.25	4.04	0.21
Agriculture provides income	3.74	3.72	0.02
Agriculture provides job	3.67	3.40	0.27
Agriculture positive impact on the environment	2.92	3.88	- 0.96
Proximity to settlements or local markets stimulates direct sales	3,29	3,4	-0,11
Farmers participate in cooperatives, producer organizations and other network structures	2,5	1,71	0,79
Farmers provide ecosystem services	2,43	2,83	-0,4
Farmers participate in trade unions and other NGOs	2,43	1,88	0,55
Specialization of the farms is appropriate for the area	2,78	2,96	-0.18

Source: Own study

Directly connected with the production specialization is the assessment of the statement that the natural and climatic conditions of the territory allow the grow of crops and animals from which higher incomes can be generated. This statement is estimated with 3.44 from experts in the North East region and only 2.72 from those in the South Central region (Table 2).

Table 2 Assessment of agricultural holdings development trends

Development trends	North East region	South Central region	Difference
Crops and animals can be raised in the area, from which higher incomes per unit area and per animal can be generated	3,44	2,72	0.72
Labor shortages are a reason for limiting labor-intensive industries	3,81	4,16	-0.35
The number of farmers aiming at producing quality products is increasing	2,88	2,88	0
The number of farmers aiming to produce organic products is increasing	3,17	2,48	0.69
The number of farmers applying agri-environment practices is increasing	2,68	2,64	0.04
The number of farms aiming at providing livelihood to the household increased	2,85	3.47	-0,62
The number of farms with non-agricultural activities increased	1,6	3.13	-1,57
The number of holdings making direct sales increased	2,38	3.5	-1,12
The number of farms processing agricultural products increased	2,17	2.08	0,09

Source: Own study

The assessment of the changes and trends in the development of agriculture in both regions shows that in the South Central region the limited labor resources are the more significant reason for limitation the labor-intensive productions in comparison with the North East region. Moreover, in the South Central region are more pronounced the tendencies of increasing of:

- the number of holdings aiming to provide food for households
- the number of holdings that carry out direct sales and
- the number of farms that diversify their activities with non-agricultural activities.

At the same time, the assessment of the changes in the number of farms that process their production is low - only 2.17 in the North East and 2.08 in the South Central region.

CONCLUSIONS

The statistical information and the results of the survey are the basis of the following conclusions:

Different models of agriculture with their inherent characteristics and impacts have been formed in the studied areas.

The northern model could develop successfully by deeping the processes of specialization and concentration of production. It is based on the three main processes of modernization: "intensification (through mechanization, use of chemicals and variety selection), specialization (farmers concentrate in few products with higher returns) and concentration (production comes from fewer farms and specific regions)" (Ilbery, Maye, 2010). Applied mainly on farmed agricultural land in agricultural holdings specializing in the production of arable crops, it has led to a high efficiency of production and labor productivity based on the modernization of applied technologies. This model of agriculture leads to a faster reduction of employment in agriculture, rising unemployment and declining the number of rural population (Doitchinova et al.,2018).

The southern model of agriculture is developed mainly on the basis of family farming, including various structures, combining the production of vegetables and fruits with different livestock, predominate in number and distribution. They are mainly used in family labor, as mechanized part of the work processes. Unemployment is relatively higher in rural areas and farmers grow more and more diverse products that create higher added value. There is an increase in the number of farms that develop other activities. These activities are the source of additional income.

Overall, in the South Central Region a more diversified rural economy with higher entrepreneurship initiative is observed, as well as higher added value, including these value created from agricultural activities and tourism.

Regardless of the specific characteristics of both and their impact on the regions, agriculture continues to perform social functions and agricultural policy is aimed at stimulating the application of agro-environmental practices, production of high quality products with less negative impact on the environment and development of environmentally friendly sustainable agriculture.

Acknowledgements

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WASTE WATER USE IN AGRICULTURE – COMPARATIVE STUDY FROM BULGARIA AND EU

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ABSTRACT

The issue of sludge management received from the Wastewater treatment plants (WWTP) is extremely relevant and indisputably one of the issues discussed not only in Bulgaria but also in the entire European Union. Work is underway to establish criteria and approaches for assessing the impact of sludge on the soil-fertilizer-plant system and the potential of individual soils to accept sludge without compromising their multifunctionality. The positive role of sludge on the balance of humus as a result of activating the activity of soil microorganisms has also been proven.

The purpose of this report is to make a comparative analysis between Bulgaria and some countries in Europe in the utilization of sludge in agriculture, obtained from wastewater treatment in WWTP.

According to European Union law, sewage sludge from populated areas is non-hazardous and, if properly managed, does not pose a risk to the environment or human health, on the contrary, it may be beneficial provided that certain conditions are met preconditions.

Keywords: *Waste water, Sewage sludge, agriculture, Bulgaria, EU*

INTRODUCTION

The Sewage sludge contains organic and inorganic nutrients that can replace mineral and manure used in agriculture. The sludge naturally acts as a soil improver and promotes soil fertility.

However, in some countries of the European Union some restrictions have been introduced on the utilization of sludge on agricultural land. So far, in general, there are no serious indications that additional restrictions will be taken in this area. It is useful to know that the presence of sediment in the soil further enhances its ability to retain water, permeability and porosity, which are indicative of good functional status. The treatment, disposal and utilization of sludge in agriculture are carried out in accordance with the legal framework, with special care for human health and environmental protection.

Sludge contains not only valuable components for agriculture (including organic matter, nitrogen, phosphorus, potassium and, to a lesser extent, calcium, sulfur and magnesium), but also pollutants, which usually include heavy metals, organic pollutants and pathogens. In accordance with European legislation, Wastewater treatment plants (WWTP) sludge is non-hazardous waste which, if properly managed, does not pose a danger to the environment and human health. After proper and environmentally friendly treatment, they can be beneficial to the environment. There are a number of possibilities for utilization and disposal of WWTP sludge. Some of them are long-standing good practices, for example, their utilization as a soil improver on agricultural land and in the reclamation of disturbed terrains. Another more modern approach to their utilization is their use as fuel for energy production.

Historically, the treatment and disposal of sludge has always been a greater challenge than wastewater treatment activities. This is due to the fact that, unlike wastewater, which is naturally included in the natural hydrological cycle without retention in treatment plants, sludge accumulates in WWTPs and due to their specific features, their inclusion in an environmentally friendly way in the natural cycles of transfer and conversion of substances in nature is significantly more difficult and requires significant costs.

The sludge contains not only valuable components for agriculture (including organic matter, nitrogen, phosphorus, potassium and to a lesser extent, calcium, sulfur and magnesium), but also pollutants, which usually include heavy metals, organic pollutants and pathogens. In accordance with European legislation, WWTP sludge is a non-hazardous waste which, if properly managed, does not pose a danger to the environment and human health.

After proper and environmentally friendly treatment, they can be beneficial to the environment. There are a number of possibilities for utilization and disposal of WWTP sludge. Some of them are long-standing good practices, for example, their utilization as a soil improver on agricultural land and in the reclamation of disturbed terrains. Another more modern approach to their utilization is their use as fuel for energy production.

The aim of the study is to make a comparative analysis between Bulgaria and some countries in Europe in the utilization of sludge in agriculture, obtained from wastewater treatment in WWTP.

METHODOLOGY

Statistical information from Eurostat, MAFW Department of Agrostatistics was used.

RESULTS

There are important changes in the EU in terms of the amount of sludge used and the ways in which it is recovered. According to recent studies, approximately 39% of the sludge formed in the EU is used in agriculture. In Bulgaria this amount is about 33%. Apart from agricultural needs, sludge is also used in forestry, as well as in the reclamation of disturbed terrains, such as unusable mines or closed landfills. Although the total amount of sludge recovered in agriculture in the EU, significant changes are already taking place in some Member States. Switzerland and the Netherlands, for example, have restricted the use of sludge in agriculture. Other regions of Europe, such as Flanders in Belgium, Bavaria in Germany and parts of Austria, are gradually shrinking this opportunity due to growing public safety concerns. as a result of wastewater treatment after residue precipitation. They are formed during the release of these organic substances during the various stages of the wastewater treatment process.

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The extent to which Member States reported to have set down conditions on the agricultural use of sludge in line with the requirements of the Directive varies.

27 States reported the methods by which sewage sludge is treated before being applied to land, indicating that sludge treatment infrastructure is well established across the EU28. The outstanding

Member State is Malta, which does not treat sludge prior to application in agriculture because it does make use of sludge in agriculture.

Estonia reports that it no longer allows untreated sludge to be used in landscaping and re-cultivation. In what could be regarded as a tightening up of the rules controlling the use of untreated sewage sludge.

17 of the 22 Member States that responded in 2013-2015 reported to have set time periods of three weeks or greater. According to reporting for earlier periods, it can be said that Italy, Latvia, Spain and the United Kingdom have also set such time periods.

From these 22 Member States which reported to have set time periods, examples of time periods which are greater than three weeks have been reported by a number of Member States. Denmark and Sweden have set the longest periods (Sweden has set a period of 10 months while Denmark has set a period of one year). Croatia, the Czech Republic, Germany, Hungary and Poland reported that the use of sludge on grassland before grazing and crops before harvest is prohibited at all times, but did not provide a determinate time period to give meaning to the term 'before'. The Member States are known to put sewage sludge to agricultural use.

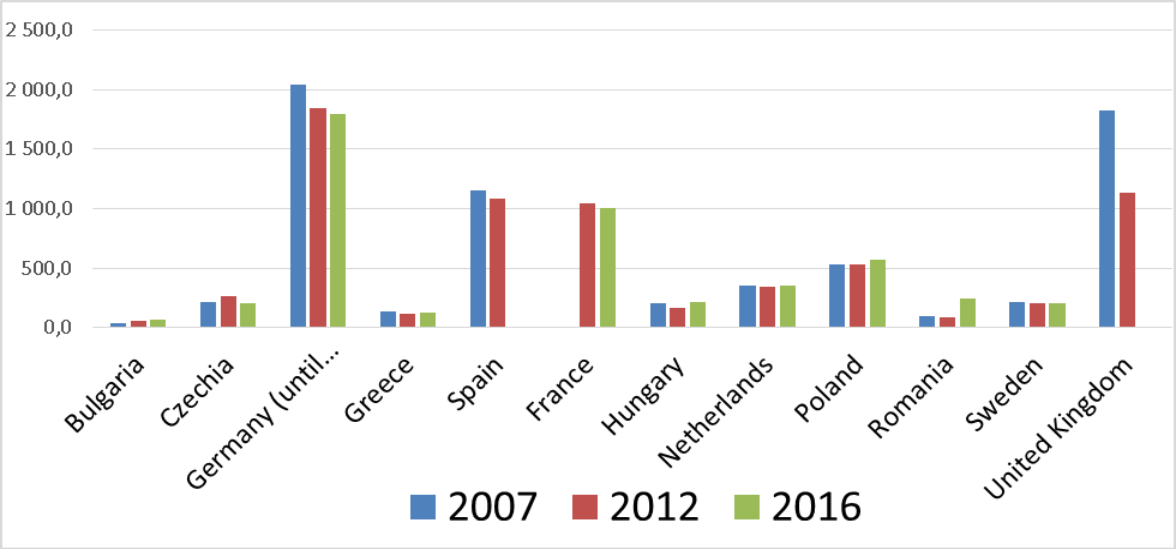
Greece and Romania have not provided responses to this question indicating that they have not implemented a time period during which it is forbidden to use sludge on grassland before it is grazed and on forage crops before harvest. According to the latest data provided to the European Commission by EU Member States, more than 10 million tonnes have been produced. Due to the lack of information in the preparation of this study and the progress made in Europe during this time in the field of wastewater treatment, it can be assumed that the total amount of sludge generated in the EU is currently significantly higher.

Germany, the United Kingdom, Spain and France are leaders in Europe in the production of WWTP sludge. In France, more than 25% of the amount obtained is plowed in arable land. For 2017, Ireland nearly 80% of the sludge is used in agriculture, Latvia is 48% and is in second place. (Fig.1;2).

Albania ranks first with 34kg. dry sludge per capita and respectively 3 kg / person utilized in agriculture for 2017. Next is Hungary with 27 kg. dry matter per capita total amount of sludge and 2.8 kg. per person utilized in agriculture.

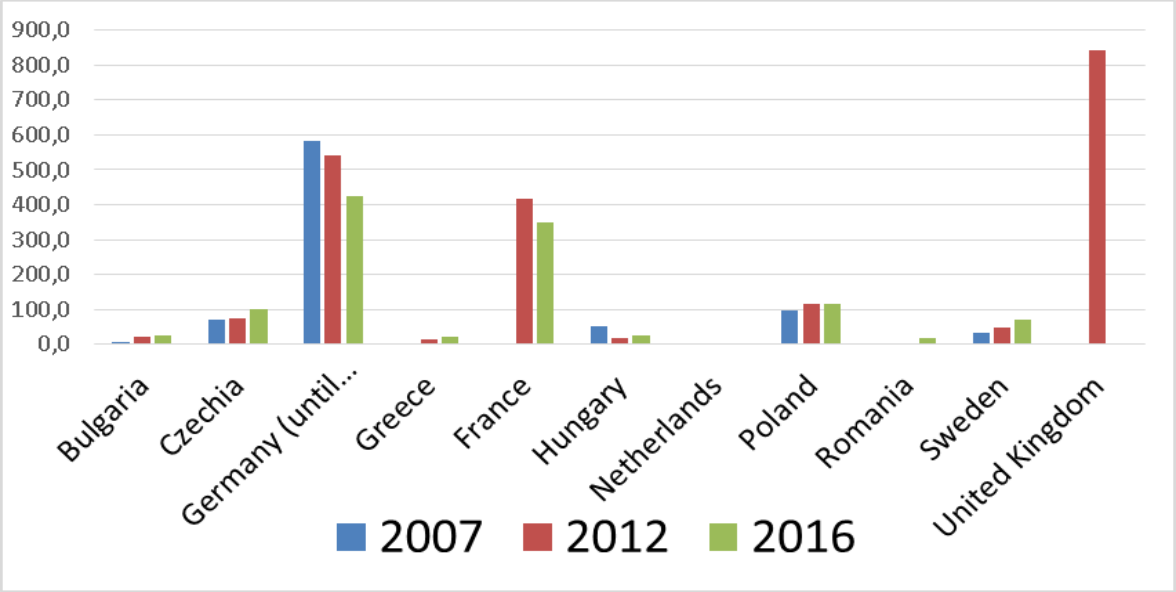
In Bulgaria, an average of 9 kg of sludge is generated per person, and about one third of dry matter is utilized in agriculture. Romania, as a neighboring country, the gold-plated sludge is 1 kg. per capita, and the total amount of sludge per capita 14 kg.

Figure 1. Sewage sludge utilization and disposal from urban wastewater (in dry substance (d.s) in some European countries (Thousand tonnes)



Source of data: Eurostat

Figure 2. Sludge disposal - agricultural use (Thousand tonnes)

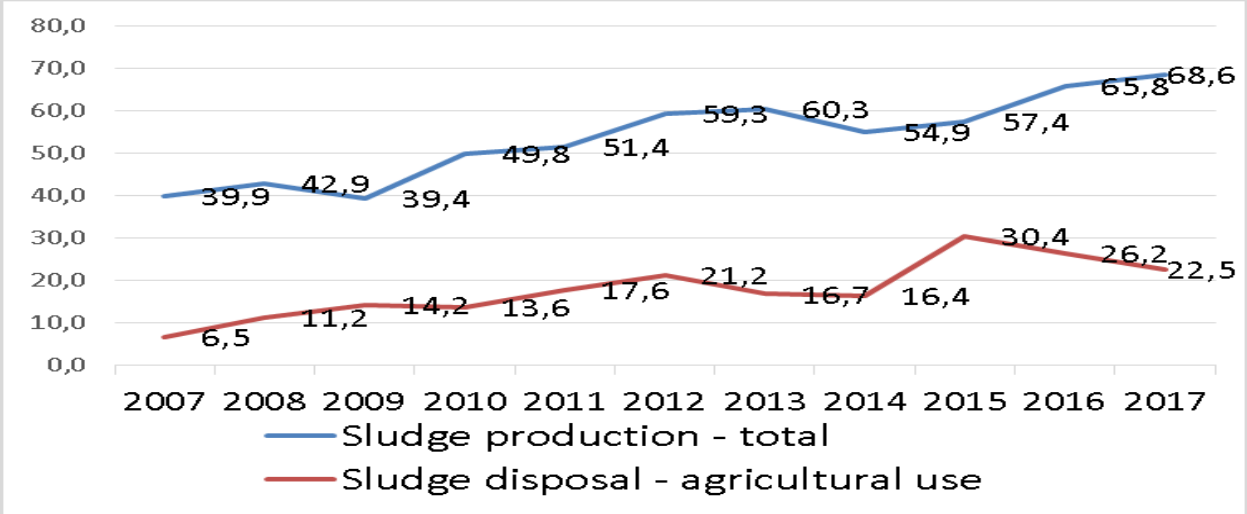


Source of data: Eurostat

During the period 2006-2017 in WWTP in Bulgaria there is almost 80% increase in the generated sludge, which from 38 thousand tons of dry matter reaches 68.6 tons at the end of the period (Figure 3). The utilization of sludge in agricultural lands compared to the total amount is on average 33%. According to Eurostat data, the largest amount of recovered sludge in agriculture was reported in 2015 - nearly 53%, followed by 2009 and 2016, respectively by 42 and 40%. In 2007 - is the smallest imported quantity - only 16%. For the period 2006-2017, the share of sludge disposal decreased three times, as from 11.9 thousand tons of dry matter in 2016, it was limited to 3.8 tons in 2017.

The sludge disposal is required to be stopped by 2020.After 2011 in Bulgaria as an alternative to the recycling of sludge is its composting together with biowaste . The obtained high-quality organic fertilizer (compost) is of high quality and safe for the health of the population and the environment. The composting is a process with a high degree of hygiene, stabilization, drying, addition of organic substances and reduction of unpleasant odors. Existing composting systems optimize the supply of oxygen through digital control, which accelerates the decomposition of organic components. Additionally, compost could be used effectively in the fight against eroded terrain.

Figure 3. Sewage sludge utilization and disposal from urban wastewater, in Bulgariq, dry substance (d.s), Thousand tonnes (2006 - 2017)

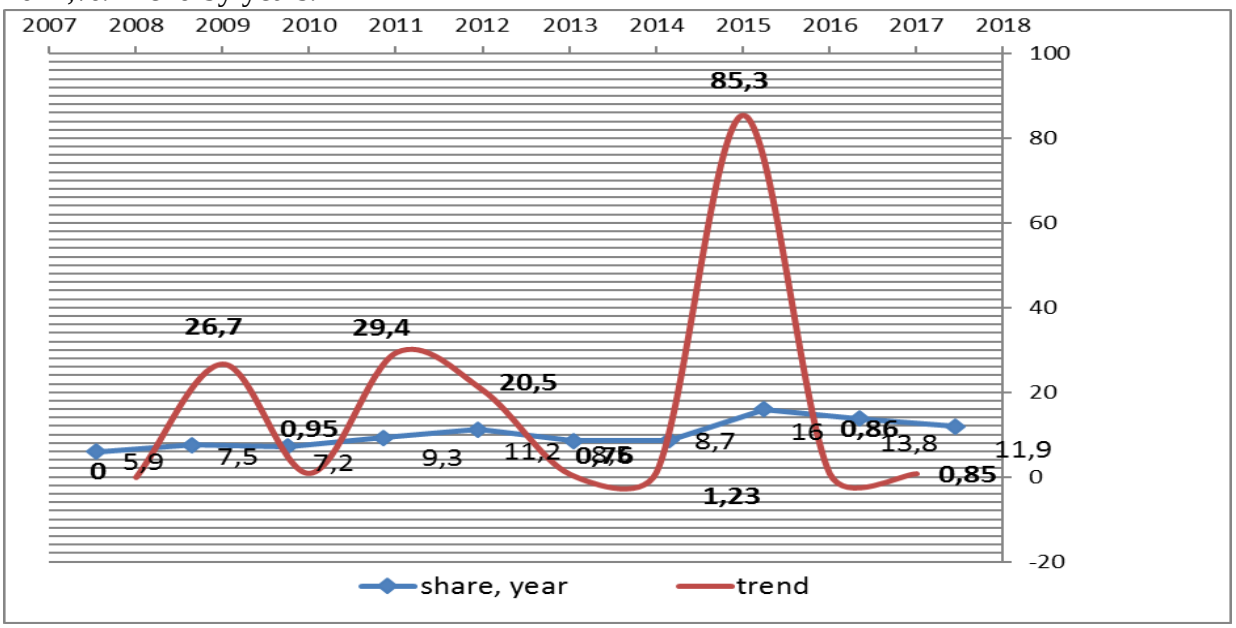


Source of data: Eurostat

Figure 4 shows the share of the utilized dry sludge in Bulgaria in the arable lands by years to the total amount in agriculture imported for the period 2008-2017 and respectively the

percentage change by years compared to the previous one. There is a steady growth in the trend, the most sensitive being at the end of the period. In 2015, the share of sludge imported into agriculture was the highest (16%), compared to the total amount received during the ten-year period. This is almost 2.8 times increase compared to 2008. Compared to the previous 2014, the growth in 2015 is over 85%.

Figure 4. Proportion utilized sludge dry substance (kg) on the total quantity for the period 2008-2017,%. Trend by years.



Source of data: Eurostat, Agrostatistics and own calculations

So far, Bulgaria is trying to adhere to the requirements of European directives and is doing everything possible to improve the quality of treated wastewater and ensure the safe disposal of generated sludge throughout the country. Now is the time to take the next step, namely to gain international experience in the field of sewage sludge management and to adopt those practices that are good for us and our environment.

Bulgaria has reported that if national measures have been adopted that are stricter than those provided for in the Directive at EU There shall be no utilisation of sludges in agriculture, where:

- Sludges constitute or contain hazardous waste;
- Concentrations of one or more heavy metals and arsenic in the soil either before or after application of the sludge exceed the permissible concentrations;
- Concentrations of one or more heavy metals, arsenic and persistent organic pollutants in the sludge exceeding permissible concentrations in accordance with Annex 2;

- Sludge not previously treated;
- Soil is a pH of less than 6;
- There is a risk of contamination of the associated surface and groundwater

CONCLUSION

Sludge treatment requires a careful and advanced approach. Whether this will be achieved easily or difficultly and whether it will be costly depends on many things. Local topographic factors, agronomic and economic conditions, as well as the attitude of stakeholders have a significant impact. For this reason, cooperation between stakeholders is of particular importance, as is planning by the regions and individual treatment plants. Solving the issue of utilization of WWTP sludge in agricultural practice meets the needs of agricultural holdings and the requirements of the Ministry of Agriculture, Food and Forestry and the Ministry of Environment and Water. The urgency of the issue is also determined by its compliance with the priorities of the European Union. In general, EU countries use a wide variety of sludge treatment technologies, which have a direct and two-way link to the main ways of disposing of them in the countries concerned.

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ECONOMIC SECTORS - THE BASIS FOR THE DEVELOPMENT OF ECONOMIC ACTIVITIES BY REGIONS IN BULGARIA

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ABSTRACT

I use the economic sectors (Agriculture, fisheries - AFF, Industry and Services) as the three main parameters in the economic activity of the country, revealing the economic picture by region, country and potential for development. I apply the Gross value added (GVA) as an indicator for comparing the economic growth or decline for a given sector at regional level for a seven-year period 2008-2018. The development of the regions and the related policy in the EU and in particular in Bulgaria focuses on a set of spatial priorities, including regions with different levels of socio-economic development. For this purpose, I apply the classification, Nomenclature of Territorial Units for Statics (NUTS).
Key words: GVA, NUTS, district and economic sectors.

SUMMARY

The application of Regional Spatial Planning and, consequently, the NUTS classification, gives a clearer economic picture of the regions, as administrative territorial units that can be influenced by economic methods and models. The research and analysis of the three basic economic sectors (Agriculture, Industry and Services) within ten years, visualized by regions gives a clear economic picture of the state of the economy and the possible development of future strategies based on analysis and conclusions. The comparison of GVA in million bg, (produced products) by regions, presents the economic situation on a horizontal level and the possible measures and strategies that can be made and applied to stabilize the respective administrative unit. A number of scientists and teams work in the field of agricultural science and economic sectors of the country (Bachev, H., Ivanov, B., Toteva, D., Sokolova, E., 2017, Borisov, 2009, 2019, Markov, 2018, 2019, Mihailova, 2019, Milusheva, 2018, Nikolov, Fidanska, 2019, Todorova, 2017). Other scientists are also working on the issues of this topic, and their material will be the subject of our next scientific activities.

MATERIALS AND METHODS

In developing the material I apply - Regional Spatial Planning, as a development strategy for EEC/EU countries, developed at a later stage as a NUTS classification and all this related to socio-economic development, both by region and by economic sector. I also apply the definition for the formation of “regions”, according to the relevant regulations for the country. For the

research and analysis of GVA within a ten-year period (2008-2018) I use the statistics for the country and by regions of the NSI and making my own calculations. I use a comparative, statistical and mathematical method in the study and analysis of the economic regions of the country.

The purpose of the present study is to make an analysis and comparison between the regions, in relation to the three leading economic sectors, related to the overall economic picture of the country. As a result, the conclusions obtained from the results and the discussion will be used for further research.

PRESENTATION

Regional spatial planning, research and analysis of regions, their formation in different territorial administrative systems, are the subject of the European institutions. It is related to the development of the countries in political, social and economic terms. For Europe, integration in the regional aspect as a political act took place on 20.05.1983 in Teramoles, Spain. The ministers of the then member states of the European Economic Community (EEC/EU) responsible for regional planning issues adopted a charter for "European regional spatial planning". This document is recommended to the member states of the Union as a democratic community. For the first time, the goals, tasks of the policy for spatial planning, improvement of the quality of life, the activities of the population in the EEC/EU countries are defined and outlined.

The region as a concept is largely associated with centralization as a concept in political and socio-economic geography. The use of the territory allows for greater freedom for the development of social and economic activities. The region has a separate center, which is developing and influencing the peripheral territories that have a future and opportunities for development. In turn, the regions are formed as a result of their unique: geographical, historical, location, natural, ecological and socio-economic conditions. The region is part of the national territory, different from the other territories, having the connection of the elements and overall development at a certain historical moment.

For Bulgaria, the terminology used is "region", accepted by a team of BAS (2002) ... "an important requirement is that the regions be radically different in territorial scope and functions from territorial in which the policy of local authorities is implemented ..."[5].

Based on this classification, the Republic of Bulgaria is divided into three levels, according to the NUTS classification, level 1 covers the two territorial zones of Northern and Southeastern Bulgaria and Southwestern and South-Central region. NUTS 2 covers the six statistical regions (North-West, North-Central, North-East, South-East, South-Central and South-East). NUST 3 with 28 administrative territorial areas. At the local level, LAU 1 has 264 municipalities, with 232 belonging to rural areas as of 2017.

[5] BAS, Physical and socio-economic geography of Bulgaria, ed. For Com Sofia, 2002, Karakashev, H., etc., Problems of regional development: Lecture course Hristo Karakashev, Sonya Dokova, Kamen Petrov., Gabrovo ed. Ex - Press, 2008.

In the sense of the RDA Act of 2008[6], regions are formed on the basis of their geographical location and population. Areas that form level 1 do not constitute administrative-territorial units and are as follows:

1. Region "Northern and Southeastern Bulgaria", including the Northwestern region, the North Central region, the Northeastern region and the Southeastern region;

2. Region "Southwestern and South-Central Bulgaria", including the Southwestern region and the South-Central region.

The regions that form NUTS 2 level do not represent administrative-territorial units including the following regions: 1) Northwestern region, including the districts of Vidin, Vratsa, Lovech, Montana and Pleven; 2) North-Central region, including the districts of Veliko Tarnovo, Gabrovo, Razgrad, Ruse and Silistra; 3) Northeastern region, including the districts of Varna, Dobrich, Targovishte and Shumen; 4) Southeastern region, including the districts of Burgas, Sliven, Stara Zagora and Yambol; 5) South-Western region, including the districts of Blagoevgrad, Kyustendil, Pernik, Sofia and Sofia; 6) South-Central region, including the districts of Kardzhali, Pazardzhik, Plovdiv, Smolyan and Haskovo.

For the research and analysis of the economic sectors in the scientific material for the country and the statistical regions, for a ten-year period I apply GVA, as an indicator determining the real state of the different types of activities related to the economic potential of the country by regions. a measure of the value of goods and services produced in a territory over a period of time. It is the difference between the final value of output and the value of goods and services consumed for its production. The three basic departments of the economy are included in the development (in the Services sector the activities from the sub-sector of IT activities are not included).

RESULTS AND DISCUSSION

For the research and analysis of GVA I use the statistics for the country and the regions, within a ten-year period from 2008 to 2018, including the three basic sectors on which the overall socio-economic development of Bulgaria depends. The survey as statistical information is presented in three tables and three figures, visualizing the real economic situation by region. Going down on a micro level to the small administrative structures gives a clearer economic picture of the state of the system, regardless of which economic or sub-economic sector it is. In the development I apply GVA as an indicator for determining productivity within a certain period of time.

[6] Regional Development Act from 31.08.2008 г. Change SG, Num. 66 from 26.06.2013, defined in Chapter Two: Territorial basis of regional development in Article 4. (2).

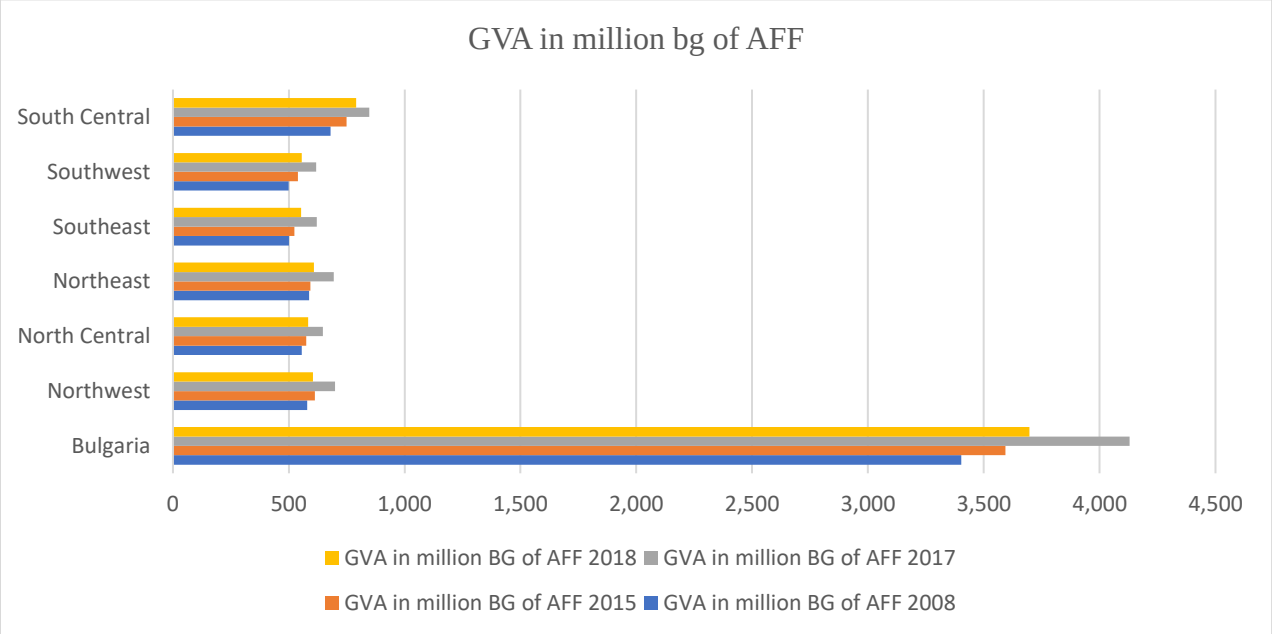
Table 1 GVA in million bg in sector Agriculture, Forest and Fisheries in the period 2008-2018 г.

District	GVA in million bg of AFF			
	2008	2015	2017	2018
Bulgaria	3 403	3 594	4 129	3 697
Northwest	580	612	700	604
North Central	556	575	647	584
Northeast	587	593	695	609
Southeast	501	524	621	553
Southwest	499	540	618	556
South Central	680	749	848	791

Information NSI

For Bulgaria on table 1 shows the period of GVA survey for the sector of Agriculture, Forestry and Fisheries within ten years has a growth of 7,9% in 2018, and in 2017 the highest value of production in bg., equivalent is reported. The South Central and North-Western regions have the highest average values according to GVA, as the former during the whole survey period reports high indicators of GVA, compared to the other regions of the country. The South-Central region is traditionally developed from an agricultural point of view, due to the favorable natural and climatic conditions, formed traditions in agricultural activities and last but not least the proximity to large markets and processing industries.

Figure 1 GVA in million bg, by statistical regions for a period 2008-2018 г.



Source: Information NSI and calculations of the author

In figure 1 for the survey period for Bulgaria within ten years with the highest value of GVA is reported in 2017, with growth of 10,4% higher than that of the following year. This indicator is reported in all statistical regions of the country. The lowest values of GVA are reported in 2008, compared to the indicators from 2017, the difference is 17,6%.

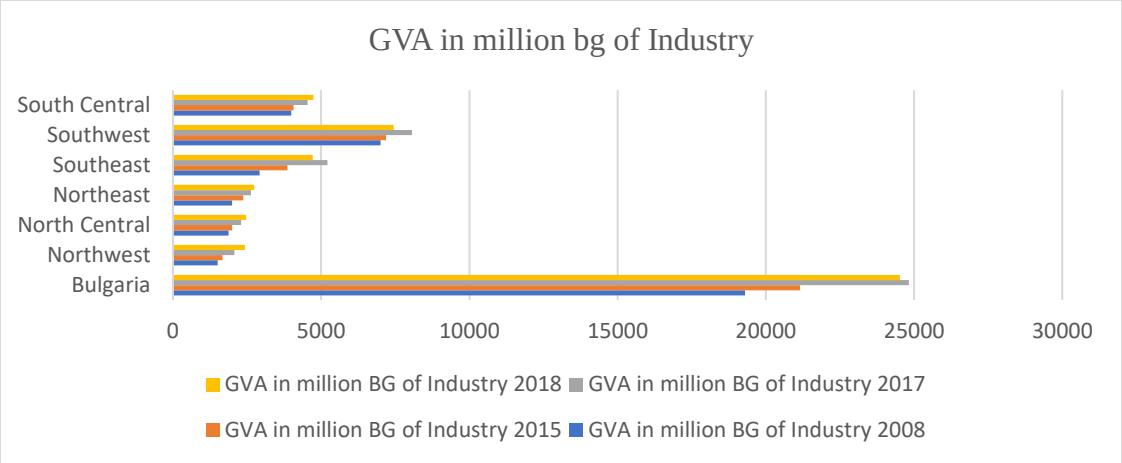
Table 2 GVA in million bg in sector Industry in the period 2008-2018 г.

District	GVA in million bg of Industry			
	2008	2015	2017	2018
Bulgaria	19298	21157,62	24821,39	24521,96
Northwest	1512	1,673	2,070	2,425
North Central	1875	1,998	2294	2464
Northeast	1999	2,371	2,633	2,735
Southeast	2927	3865	5214	4714
Southwest	6998	7,188	8,064	7,447
South Central	3987	4063	4547	4736

Source: Information NSI

For Bulgaria on table 2 shows the period of GVA survey for the Industry sector, the statistics and the analysis are based on a ten-year period, which includes the regions as administrative structures. The largest growth of GVA is reported in 2017 for the country, as the comparison with the initial period is 21% higher. By regions with the largest share of GVA falls in the southwestern region, throughout the study period. With the lowest values of produced GVA is the northwestern region. When comparing the indicators from the last year of the survey between the leading region and the least represented, the difference is 67% in favor of the southwestern according to the reduced GVA. The drastic difference is in the concentration and centralization of both industrial capacity and human capital.

Figure 2 GVA in million bg by statistical regions for a period 2008-2018 г.



Source: Information NSI and calculations of the author

In figure 2 for the study period for Bulgaria within ten years with the highest value of GVA is reported in 2017. The same indicator is reported for the Southwestern and Southeastern economic regions for the same year. The logic of the economic development for the country and the regions and in in figure 2, follows the sequence of development, South-Central and Southwestern regions have the largest share of produced GVA for the entire ten-year period, with the lowest share being the Northwestern region.

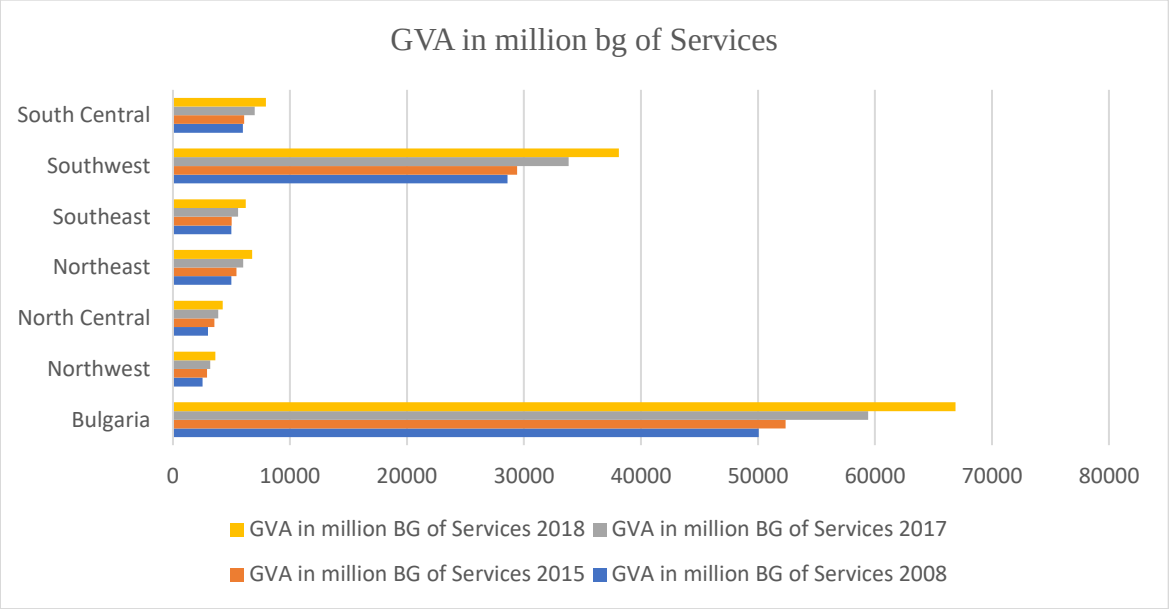
Table 3 GVA in million bg in sector Services in the period 2008-2018 г.

District	GVA in million bg of Services			
	2008	2015	2017	2018
Bulgaria	50066	52371,71	59418,8	66889,48
Northwest	2519	2,901	3,192	3,625
North Central	3001	3543	3878	4246
Northeast	4985	5,415	5,995	6,755
Southeast	4987	5008	5563	6218
Southwest	28587	29,424	33,812	38,112
South Central	5987	6081	6979	7934

Source: Information NSI

For Bulgaria on table 3 visualizes the period of GVA survey for the Services sector within a ten-year period. From the initial period to the final one there is an increase in GVA by 25,15% for the country. With the largest share of GVA compared to the national value of all areas is the Southwest region for 2018, 43%. The second region in terms of growth produced GVA is South-Central, followed by Southeast on the basis of services offered by summer tourism. Again, based on the economic logic, the North-Western region ranks last in terms of the produced GVA. The negative demographic growth is directly related to the Services sector, specifically for the latter region and in general for the country as a whole.

Figure 3 GVA in million bg by statistical regionsfor a period 2008-2018 г.



Source: Information NSI and calculations of the author

In figure 3 during the study period for Bulgaria within ten years with the highest value of GVA is reported in 2018, and again with the largest share of GVA falls on the South-Western region. The South-Central and South-Eastern regions follow according to the GVA formed during the ten-year study period. The North-Western region ranks last in terms of GVA with low values.

CONCLUSION

Gross value added is a measure of the value of goods and services produced in a territory for a given period of time, in which case we have a time period of ten years. For the sector of Agriculture, Forestry and Fisheries with the highest indicator of GVA for 2017 is the South-Central Region (SCR), followed by the North-East and South-West regions. The first region, indicated by production, is leading throughout the study period, due to the favorable natural and climatic conditions, the proximity of large markets, settlements and the availability of processing facilities for agricultural products. The area has a well-developed road infrastructure that supports the above sector. Administratively, the SCR maintains the base of rural municipalities or rural areas that are a priority for development. This preserves the demographic potential and traditions in the field of agricultural and non-agricultural activities. For the studied period in 2017 the country reports the highest growth of produced GVA.

For the Industry sector, during the study period 2008-2018 with the highest indicators of produced GVA in the first place is the Southwest economic region, and in 2017 the highest growth was reported. The territory has always been an industrial leader compared to the rest of the country. The concentration or centralization of economic capacities leads to growth in the economic development of the territory, but on the other hand, imposes a monopoly over the other areas and

hinders their development. In the above-mentioned region there is a positive mechanical growth, which leads to the formation of new capacities on the part of the Industry sector, on the one hand, but on the other hand there is an imbalance of the geodemographic picture in the country. In the coming decades, the region will continue to be a leader in this area of the economy, due to the centralized policy that leads at the expense of other economic regions that are subject to the Southwest.

For the Services sector, during the survey period within 2008-2018 with the highest indicators of produced BDS in the first place is again the South-Western economic region, throughout the period. With the highest share of produced GVA is 2018, as the other sectors in the region in recent years have a lower share of production. When comparing the digital indicators, the region is many times superior to the others in production for this sector. The southeastern region, which specializes in the tourism industry, is inferior to the above-mentioned region. In the second place according to the produced GVA during the ten-year research period is the SCR. The South-Western Economic Region has several advantages in this respect for the highest GVA produced, namely: conducting a centralized economic and political strategy, large population, concentration of economic activities and hence development of the Services sector, as ancillary activities, developed infrastructure and centers offering activities related to the services of the population in all directions.

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DEMAND OF DIGITAL SERVICES IN BULGARIAN AGRICULTURE

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ABSTRACT

The entry and use of digital services is becoming more and more an invariable process in front of the perspectives and development of the Agricultural sector.This paper eximines data for the state and use of digital agriculture market in demand side. The research investigate readiness for using of digital services among the agricultural producers and the municipalities. The paper presents results from the sureveys carry out in the frame of the project "Theoretical models for digital agricultural development" – DIAGRO, financed by the National Fund for Scientific Research, Bulgaria.

Integrating digital technologies can increase the efficiency of agriculture. The research results show quite large differences both in the use of digital services among farmers in different regions in Bulgaria. Some of the agricultural holdings use digital services for specialized in meteorological information services, navigation systems. From the side of the farm management the benefits of using digital services the farmers rate the following most significant is for effective farm management. The majority of agricultural holdings learn about the digital services offered by the websites and platforms of the providers of these services

Key words: development, digital services, agriculture, sustainability

INTRODUCTION

Historically, agriculture has undergone a series of revolutions that have driven efficiency, yield and profitability to previously unattainable levels. Market forecasts for the next decade suggest a 'digital agricultural revolution' will be the newest shift which could help ensure agriculture meets the needs of the global population into the future.

Digital agriculture has the potential to deliver economic benefits through increased agricultural productivity, cost efficiency and market opportunities, social and cultural benefits through increased communication and inclusivity and environmental benefits through optimized resource use as well as adaptation to climate change.(Nikola M. Trendov, Samuel Varas, and Meng Zeng, 2019)

This paper eximines data for the state and use of digital agriculture market in demand side. The research investigate readiness for using of digital services among the agricultural producers and

the municipalities .Integrating digital technologies can increase the efficiency of agriculture. Many more actors can get involved in shared platforms and in virtual/cloud services.

Digital farming or digital agriculture is basically the use of IT in agriculture and it involves applications of connected machinery and other digital agriculture technologies. Digital farming is used to improve overall farm production, to improve financial performance and to help farmers to boost their farms productivity by means of advanced digital technology. Further, involvement of digital technology in farming is an evolution in agriculture sector and has positively impacted the efficiency and sustainability of the farms. Digital farming deals with use of biology and technology together in order to help farmers to do precise farming.

Global digital farming market is primarily driven by factors such as growing global population and rising need for effective agriculture solution which can boost efficiency and production of arable lands. In addition to this, rising penetration of advanced technologies in agriculture sector coupled with growing need for high production of grains and vegetables are key factors which are likely to drive the growth of global digital farming market.

Additionally, increasing population of green farming across the globe is fueling the growth of digital farming market. Moreover, additional benefits of digital farming such as livestock monitoring, precision farming, higher productivity and low investment are fueling the adoption of digital farming globally. Further, these additional benefits of digital farming are likely to drive the growth of global digital farming market.

Rising demand for quality crops in amount to meet the growing need of grains and vegetables is also a major factor which has led farmers to adopt digital farming solution at their fields in order to improve productivity of arable lands.

However, high cost of digital farming solutions resisting the adoption of digital farming among the farmers. This factor is a major challenge to the digital farming market and is likely to hamper the growth of global digital farming market. Apart from this, lack of awareness towards digital farming is also a major factor which is likely to dampen the growth of global digital farming market in near future.

The precision farming market is likely to increase in the long term after the COVID-19 outbreak, as precision farming makes it possible to monitor the state of the crops while not being physically present through the usage of automation, minimizing the need to contact other people, which is crucial during these times. This farming is an approach where inputs are utilized in precise amounts to get increased average yields, compared to traditional cultivation techniques. However, in the short term, COVID-19 would affect the market and the growth of the market would be relatively slower in the first and second quarters of the year 2020 due to economic slowdown and inflation.

MATERIAL AND METHODS

The main methodological approach of the research is the questionnaire method. This requires the preparation of a representative sample of agricultural holdings for the country, which will be surveyed and the results obtained will be extrapolated to the general population with a certain degree of guarantee probability.

For these purposes, the zoning method combined with the two-stage nesting model was used. The territorial attribute was used as a zoning criterion. At the first stage of the sample formation, 20 districts from the 6 planning regions were selected as nests. In the second stage, observing the principle of proportionality, the required number of agricultural holdings from each nest is selected. (Gatev, K. (1986); Kish, L., (1965; Lora L. Bohn., (1996)).

In determining the number and composition of the districts (nests) and the agricultural holdings, the requirements were observed, guaranteeing the possibility to include in the sample the districts, which reproduce to a sufficiently high degree the structure of the agricultural holdings by their specialization. In order to achieve the necessary correspondence between the structure of the production specialization of the agricultural holdings from the general population and that in the sample, two variances were calculated: one called inter-nest represents the size of the variance in each planning area, and the second refers to the variance within the planning area or so-called intra-nest dispersion.

The determination of the average error is done by the method of construction and is performed according to the following formula:

$\mu 2_{\theta r} = (\sum Nh2x\ \mu 2_{\theta h})/(\sum Nh)2$, where:

Nh is the total number of agricultural holdings in the region h (h= 1,2...6)

$\mu 2_{\theta h}$ represents the regional stochastic error and is determined by the following formula:

$\mu 2_{\theta h} = (\sigma 2_{\theta rh}/mh)x(1- mh/Mh)+(\sigma 2_{вh}/mh* Mh)x(1- ňh/ ñ)$, where:

$\sigma 2_{\theta rh}$ is the inter-nest dispersion;

$\sigma 2_{вh}$ is the intra-nest dispersion;

mh is the number of nests (areas) to monitor in an area h;

Mh is the total number of nests (areas) in an area h;

ňh is the average number of units (agricultural holdings) to be observed in one nest in an area h;

ñ is the average number of units (agricultural holdings) in a nest in an area h.

The inter-nest and intra-nest dispersion are modified forms of the general formula by which the dispersion is calculated in the ordinary sample:

$$\sigma 2 = \sum(Xidh - \bar{X}dh)2/(ndh-1)$$, where:

the index *i* identifies the type of agricultural holding (i =1,...8);

Xidh means the number (or relative share) of the agricultural holdings in area *d* of region *h*;

Xdh is the average number of agricultural holdings in district *d* of region *h*;

ndh is the number of different groups of agricultural holdings.

After determining the average stochastic error, the so-called maximum allowable estimation error is calculated, taking into account the confidence level and the corresponding guarantee factor *t*. The most commonly used values are 95% guarantee probability of the obtained evaluation results and t = 1.96. The formula by which the maximum permissible error is calculated is as follows:

$\Delta\theta = \pm t^* \mu\theta r$

The general formula for determining the sample size in elementary units (in this case agricultural holdings) for a two-stage nesting sample is as follows:

$n\theta = (t2^* \sigma \theta 2)/(\Delta\theta 2)(1 + \delta^*(ñ-1))$, where the individual symbols have the semantic meaning noted above.

Results from the application of the methodology for determining the model and the sample size.

At the first stage, the obtained results show that the sample includes 20 districts from the 6 planning regions. These are the districts: Montana, Lovech, Pleven, Silistra, Razgrad, Veliko Tarnovo, Targovishte, Varna, Dobrich, Burgas, Sliven, Yambol, Kardzhali, Smolyan, Pazardzhik, Plovdiv, Blagoevgrad, Kyustendil, Pernik and Sofia region. As can be seen, the number of selected areas from each planning region is not proportional to their total number in the respective region. The reason is the different degree of scattering between the areas in the different planning regions and within the areas themselves (Table 1).

In the South-West and South-Central planning regions the values of the inter-nest dispersion are higher in comparison with the other regions. This in turn determines the need for a larger number of units (agricultural holdings) from these areas to be included in the sample.

Table 1. Values of inter-nest and intra-nest dispersion

Planning regions (NUTS)	Total number of agricultural holdings (2016 г.)	Inter-nest dispersion	Average for the region intra-nest dispersion
Northwestern region	22140	27,26	15,87
North Central region	23100	23,61	14,90
Northeastern region	22080	34,14	161,53
Southeastern region	28120	27,87	143,44
South Central region	64500	46,70	145,56
Southwestern region	42780	50,23	159,57
Total	202720	x	x

Source: Eurostat and own calculations

In the South-Central region the number of agricultural holdings is the largest, in contrast to the Southwestern region, which predetermines, together with the high values of the inter-nest dispersion, the largest number of agricultural holdings to be included in the sample. Of particular interest for consideration is the Northeastern region. The intra-nest dispersion is very high, but due to the larger average size of one agricultural holding in the region compared to the others, the total number of agricultural holdings in it is relatively smaller. In addition, the value of the inter-nest dispersion is average. Therefore, the required number of agricultural holdings in the sample should not be higher than in the other planning regions. There are many but small farms in the Northwestern region. Therefore, despite the low scattering values in the sample, it is necessary to include a relatively larger number of agricultural holdings.

As a result of the applied methodology for determining the volume and structure of the sample population, a value of 197 holdings was obtained.

The total number of agricultural holdings in the sample amounts to 194, which is approximately 0.1% (0.096) of the total number of agricultural holdings in the country in 2016. Given the declining trend in the number of insurance companies, it can be assumed that in 2020 it is smaller than in 2016. Therefore, the real share of the surveyed farms is higher than 0.1%. For the whole sample, the number of crop holdings exceeds that of livestock and mixed holdings. This is typical for all planning regions.

In order to ensure the necessary representativeness of the sample, the method of self-random selection is applied when selecting the specific agricultural holdings included in the sample.

Two non-governmental organizations are involved in the implementation of the survey- National Union of Small Family Farmers and Producers and Association of agri-environmental farmers. The survey is done in the period May-June 2020.

RESULTS AND DISCUSSION

Advances in digital and analytics technologies offer a way to optimize the agriculture supply chain. The agriculture industry is capturing more data than ever, on everything from agronomy to the weather to logistics to market price volatility. Data storage capacity has increased, storage cost has plummeted, and computational power has grown. Meanwhile, both predictive data science and prescriptive optimization techniques have matured and gained visibility.

These practices save time and costs: reduce fertilizer and chemical application costs, reduce pollution through less use of chemicals. Also, they help in monitoring the soil and plant physiochemical conditions: by placing sensors to measure parameters such as electrical conductivity, nitrates, temperature, evapotranspiration, radiation, and leaf and soil moisture, so that the optimal conditions required for plant growth can be achieved. These factors help to obtain a greater output with limited labor force during COVID-19 pandemic situation where there is a shortage of labor and thus would help in a regular supply of food, thereby ensuring food security.

One compelling way to use digital and analytics technologies is to create a digital twin of the physical supply chain—from farmers to end customers—and use it to run virtual simulations and optimizations. Digital twins can include all elements of the supply chain and its interfaces, including procurement, production, inventory points, transportation, warehousing, and points of sale for finished goods. Players can calibrate mathematical models to include a variety of objective functions, such as profit, throughput, cycle time, or inventory optimization, depending on the organization’s needs.

Digital agriculture is the use of new and advanced technologies, integrated into one system, to enable farmers and other stakeholders within the agriculture value chain to improve food production.

Most of today’s farmers make decisions such as how much fertiliser to apply based on a combination of rough measurements, experience and recommendations. Once a course of action is decided, it is implemented but the results are normally not seen until harvest time.

In contrast, a digital agriculture system gathers data more frequently and accurately, often combined with external sources (such as weather information). The resulting combined data is analysed and interpreted so the farmer can make more informed and appropriate decisions. These decisions can then be quickly implemented with greater accuracy through robotics and advanced machinery, and farmers can get real-time feedback on the impact their actions.

ANALYSIS OF DEMAND FROM AGRICULTURAL HOLDINGS

» Description of the sample

The distribution of the agricultural holdings according to their location is as follows: the largest share of the surveyed farms are from Plovdiv district - 16%, Pazardzhik district - 12.6%, Kardzhali district - 11.8% and Sofia district - 10.1%.

The data show that in the studied set of agricultural holdings, those who specialize in the cultivation of cereals and essential oils predominate - 28.2% of the total surveyed sites. They are followed by livestock holdings with 17.6% of the total surveyed agricultural holdings. The holdings with vegetable specialization also occupy a significant share of the surveyed number - 13.9%.

The next criterion by which the agricultural holdings in the studied population are identified is their size. The analysis of the survey data shows that small agricultural holdings predominate (up to EUR 8,000), namely their share is 44% of the total surveyed sites. They are followed as a significant group by the medium-sized holdings (amounting to EUR 8,000 to 50,000), whose share is 30.1% of the total surveyed holdings. The results of the survey indicate that the most common form of property management of agricultural holdings is registration - an individual, 88.7% of total surveyed holdings use it. Only 7.5 of the surveyed holdings are registered as commercial companies.

» Profile of the surveyed agricultural holdings

The surveyed agricultural holdings are a total of 197 in number. The main criteria for studying their profile are: - gender, age, education and experience in agribusiness.

The results of the survey show that more than half of the agricultural holdings fall in the range of 41 to 60 years. Next is the group of farmers aged 18-40 years, respectively, young farmers are 26.9% of the total respondents.

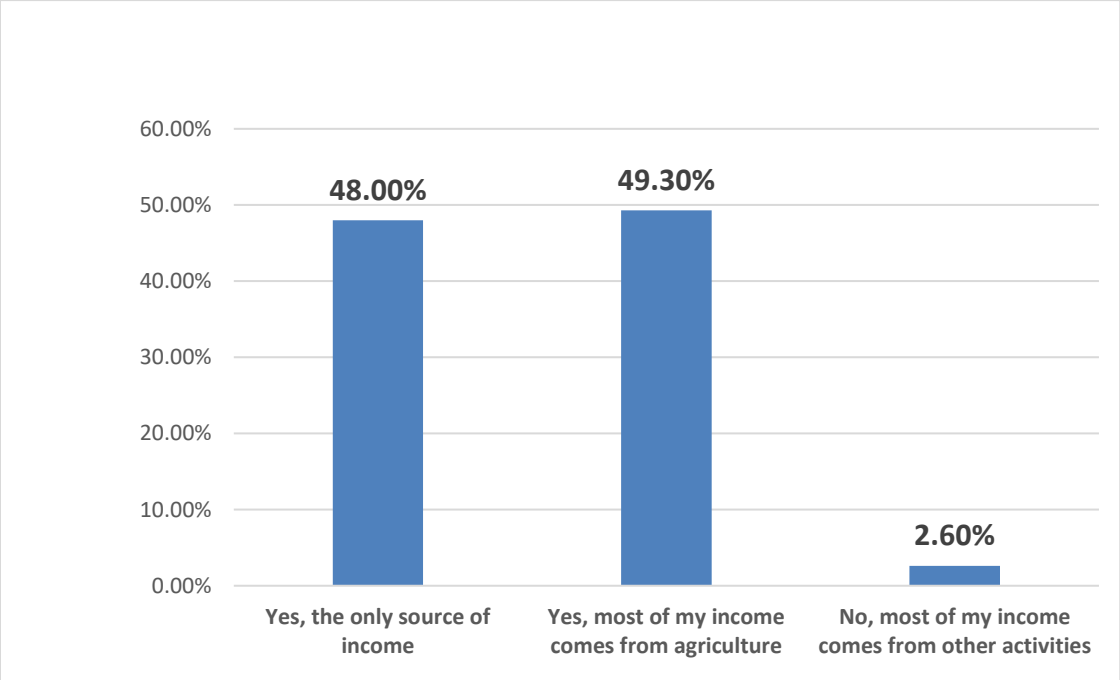
The next criterion by which the respondents were surveyed was their education. It follows from the findings that 39.9% of the respondents have secondary education, followed by the persons with higher education, respectively they occupy 32.8% of all respondents. It is noteworthy that only 20 % of the surveyed farmers have obtained a higher education degree in the field of agriculture, veterinary medicine and zoo-engineering.

Another criterion for the analysis of farmers is the experience gained. According to the survey data, 47.7% of agricultural holdings have experience over 11 years in the field of agricultural business, 30.5% of agricultural holdings have experience between 6 and 10 years. The smallest is the group of agricultural holdings with up to 5 years of experience, only 21.8% of the total respondents.

The data show that the share of the participants with project proposals to the individual measures of the Rural Development Programme (RDP) prevails - 51.3% of all surveyed agricultural holdings. The most common measures that have received funding are measure 121 "Modernization of agricultural holdings" (RDP 2007-2013), measure 10 „Agroecological payments" (RDP 2007-2013), measure 6.1 "Start-up support for young farmers" of the RDP 2014-2020.

Another criterion for differentiating the group of surveyed farmers is the type of source of income from agricultural activity. Figure 1 shows the distribution of the responses received.

Figure 1. Distribution of respondents according to the role of the agricultural business in the formation of their income.



Source: data from a survey of 197 respondents, 2020.

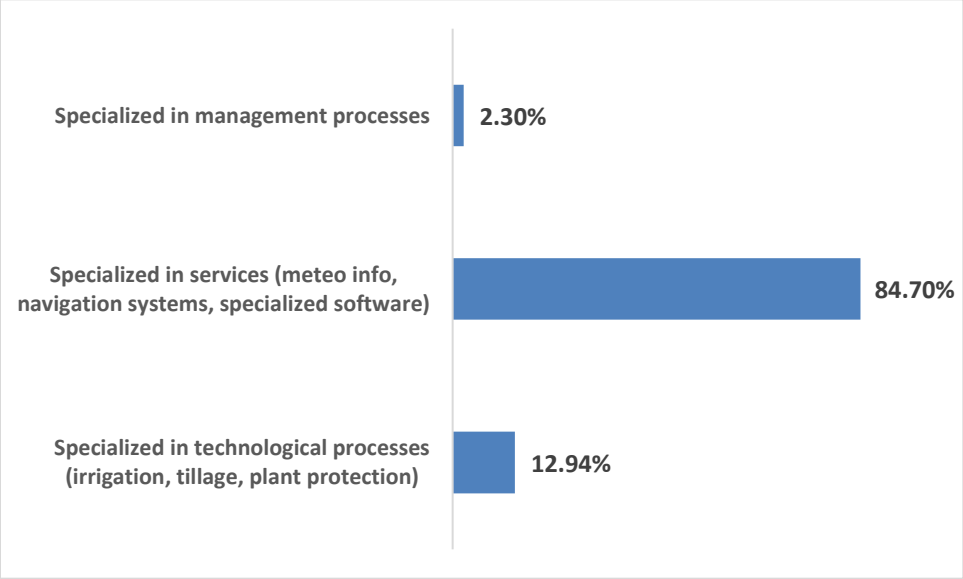
The presented data show that the majority of farmers form their income from agricultural activity - 38.3% state this. Next is the group of farmers who declare that agriculture is the only source of income for them and their families - 37.8% of all respondents.

» Profile of the requested digital services (main determinants of the demand)

The next part of the analysis focuses on the main determinants of demand for digital services by agricultural holdings as well as the identification of the main barriers limiting access to these services.

Figure 2 shows farmers' answers to the question "What digital services do you use in your business?". The data from the survey show that most often agricultural holdings use digital services such as "specialized in meteorological information services, navigation systems, specialized software", 63.4% of total respondents. Secondly, farmers indicate that they use digital services specialized in the management of technological processes, 24.2% of the total respondents indicated this type of service. Lastly, as a preferred digital service, farmers indicated the one that specializes in management of management services, 12.4% of the total respondents.

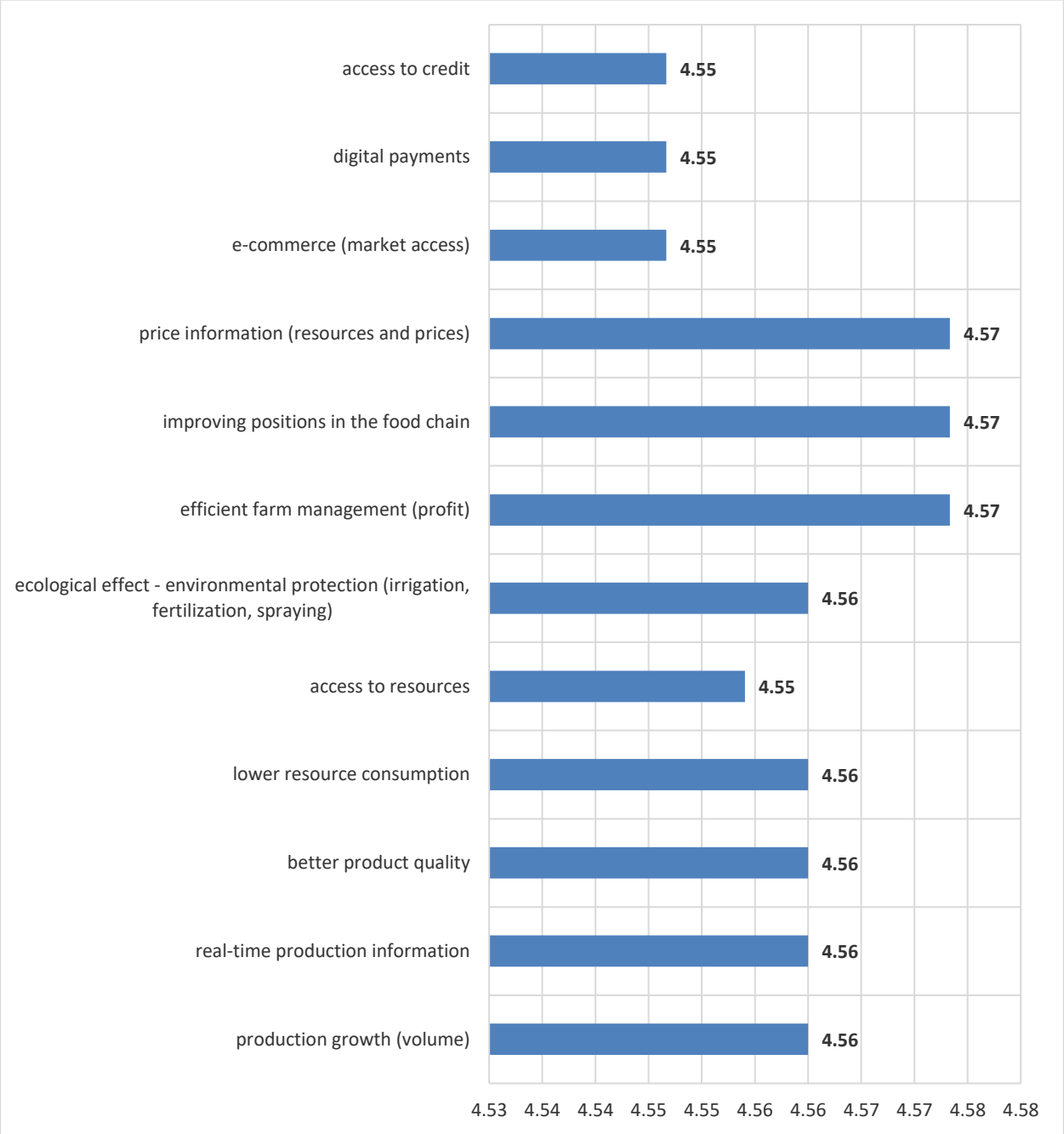
Figure 2. Digital services used by agricultural holdings



Source: data from a survey of 197 respondents, 2020.

The next question in the survey is "How do you assess the benefits of the digital services you use?". The purpose of the question is to gather information about the generated benefits of the use of digital services in carrying out the daily activities of the farmer on his agricultural holding. Figure 3 shows the assessment of the benefits of using digital services in farm management. Farmers rate the following benefits as the most significant: (1) effective farm management (average score - 4.57); (2) improvement of the positions in the food chain (average score - 4.57) and (3) price information - average score 4.

Figure 3. Evaluation of the benefits of using digital services

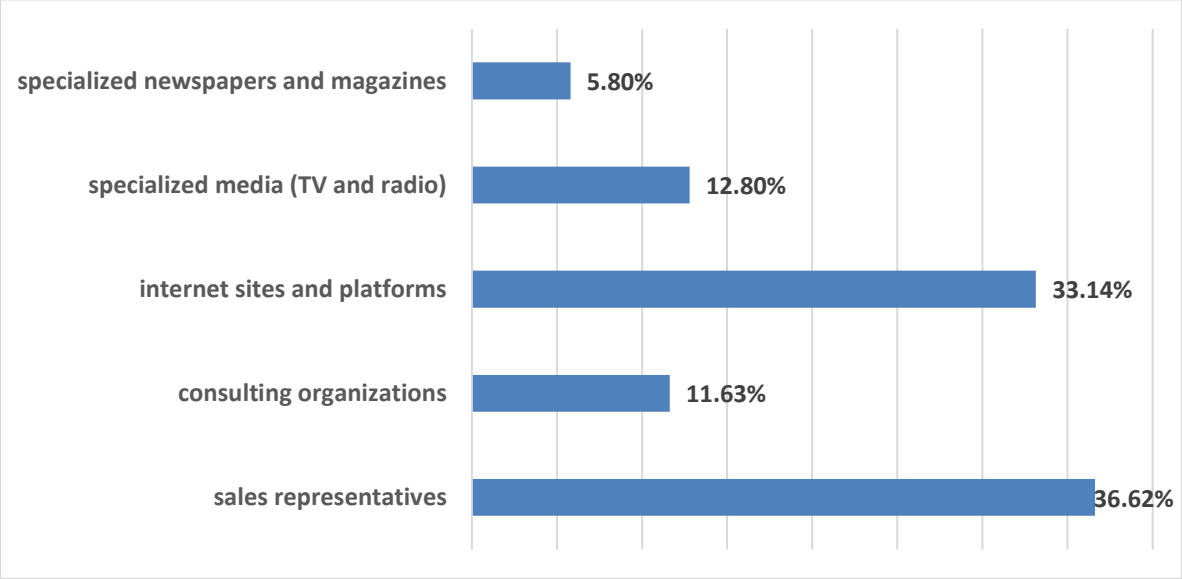


Source: data from a survey among 197 respondents, 2020. (scale 1-5 used, with 1 being the weakest and 5 being the strongest)

The next question in the survey is "Where do you get information about digital services?". Figure 4 shows the percentage distribution of the responses received by the surveyed agricultural holdings. The data presented in this way show that the majority of agricultural holdings learn about the digital services offered by the websites and platforms of the providers of these services - 35.3% of all respondents indicated this answer. The next most important source of information are the

sales representatives of digital services - 19.8% of all surveyed agricultural holdings recognize them as a reliable source of information. Another reliable source for obtaining information is the specialized media - 17.1% of surveyed agricultural holdings trust them.

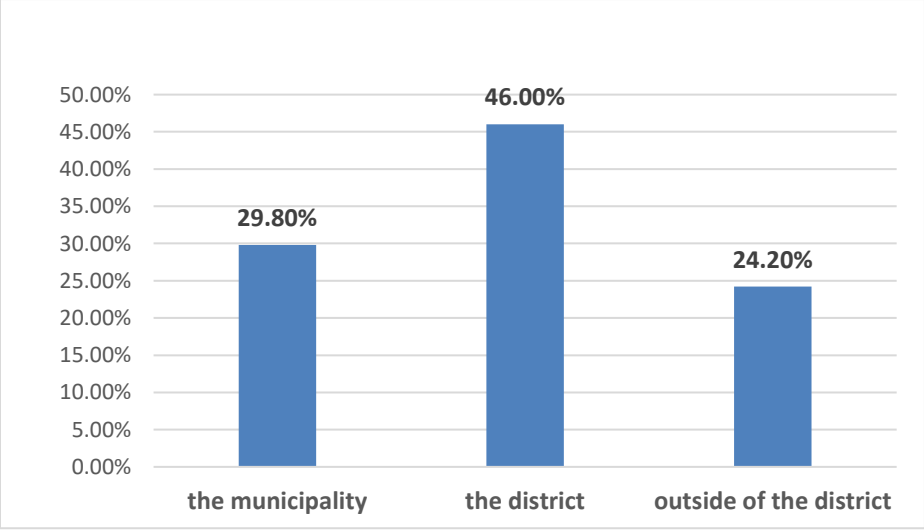
Figure 4. Preferred information sources on the digital services offered on the market



Source: data from a survey of 197 respondents, 2020

The next question included in the survey is "Where is the digital service provider?". Figure 5 presents the information obtained from this question. The information presented in this way shows that regional providers of digital services are used - 465 of the total surveyed agricultural holdings, indicate this answer.

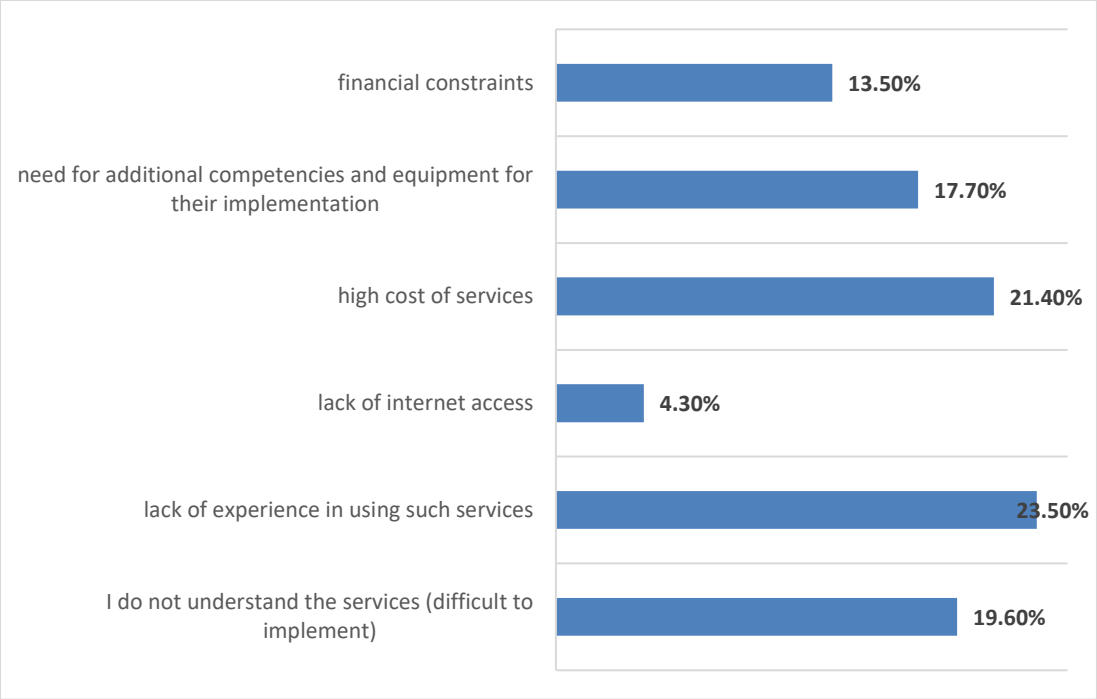
Figure 5. Location of the digital service provider



Source: data from a survey of 197 respondents, 2020.

By including the next question in the survey, the aim is to obtain information on barriers to farmers' access to digital services. Figure 6 provides information on the main barriers to the use of digital services. The graphic analysis of the survey data shows that the main limiting factors are: 91) the lack of experience in the use of digital services by agricultural holdings - 23.5% indicated this factor as the most significant problem; (2) the high price of the offered service - 21.4% of the total surveyed agricultural holdings and (3) the complexity of the digital service - 19.6% of the surveyed agricultural holdings stated that they do not use due to the complex nature of this type of service.

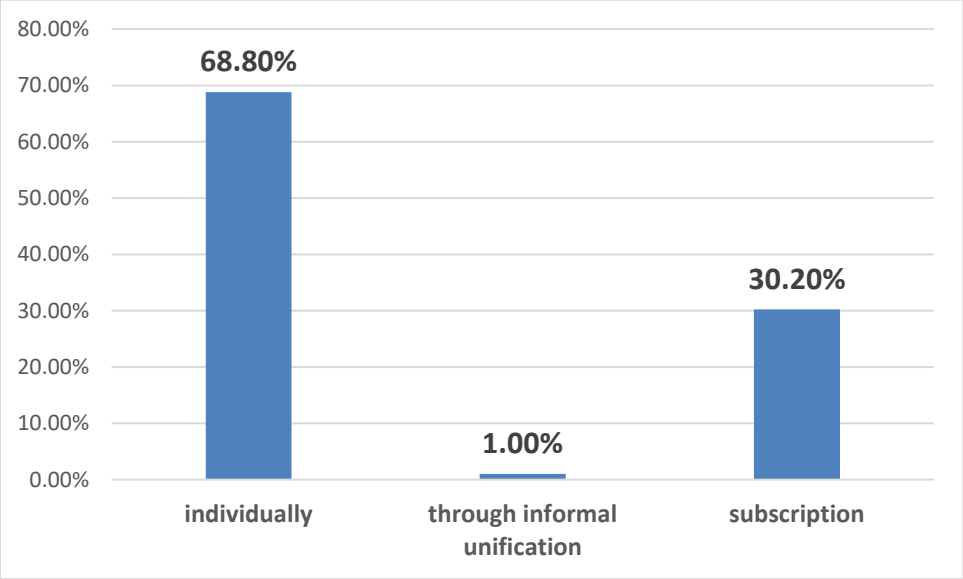
Figure 6. Barriers restricting access to digital services



Source: data from a survey of 197 respondents, 2020.

Another factor that was examined in the survey is the provision and sharing of access to digital services offered in the sector. Figure 7 shows the distribution of the responses received by the surveyed agricultural holdings.

Figure 7. Access to digital services



Source: data from a survey of 197 respondents, 2020.

The data presented in this way show that farmers prefer to use digital services individually - 73.1% of the surveyed agricultural holdings stated this. Next is the group of agricultural holdings who use digital services on a subscription basis - 19.9% of total surveyed holdings. The next question in the survey is "Do you participate in specialized information events related to digital solutions?". Of all farmers surveyed, 50.9% said they participated in seminars and conferences on the issue.

ANALYSIS OF DEMAND OF DIGITAL SERVICES FROM MUNICIPALITIES

The purpose of the study is to analyze, the level of use and implementation of digital services in the municipalities and to evaluate the readiness of the municipal administration to prepare and implement a strategy for the effective use of digital public services. The main methodological approach of the research is the questionnaire method. The results of a sample survey conducted with the assistance of the National Association of Municipalities in Bulgaria were used. The results of a sample survey conducted between July and November 2019 were used. The survey conducted included the municipalities of Belogradchik, Zavet, Koprivshtitsa, Ruzhintsi, Rudozem, Hissarya. The number of inhabitants in the studied municipalities varies from 2046 to 14 337. The municipalities that responded to the survey are a sample of all six planning regions (NUTS level 3). All the municipalities surveyed stated that they did not have a digital introduction strategy, but envisaged that such a strategy should be drawn up within 1 to 3 years

Regarding the existence of infrastructure for the introduction and use of digital services on the territory of the municipality, 80% of the surveyed municipalities indicated that they cannot assess, are not aware and do not know that such infrastructure is in place. They have indicated that they are experiencing difficulties in implementing digital services due to a lack of "human capital" and

financial resources. The remaining 20% indicated that there was an infrastructure in place for the introduction of digital services, mainly the so-called. EGovernment and are used for administrative services to the public and business.

Most of the municipalities use digital services for administrative services and only 20% for sales and marketing management. The digital, electronic programs most widely used by the municipal administration are: Cadastral and Administrative Information System (KASIS); Integrated Administration and Control System (IACS); EVENTIS R7 - Business Program and REGIX - Register of Animals and Livestock.

Reasons for not using digital services in administration are the same share (33.3%) between lack of information about the applicability of digital services, lack of opportunities for implementation and use of these services and lack of knowledge on how to use these services

CONCLUSIONS

The main objective of agriculture marketing is to reduce the cost of marketing. Use of information and communication technology (ICT) in agricultural sector can be called as e-Agriculture or e-Agribusiness. Digitalization will change every part of agri food chain but require major transformations in farming, rural economics, marketing of produce. The application of ICT in agriculture has positive effects for farmers in terms of accessing market information and promoting agricultural products. In digital world, we can revolutionize agriculture market end to end digitally.ICT helps small farm holders to find multiple buyers for producer who are willing to pay high price. Small holders deal with only handful buyers who either pickup directly from them.

Improved market access, risk mitigation, disaster management, and logistics have the potential of enhancing agriculture incomes and improving profitability. Linking markets, inputs and trade in a variety of ways can also help with complying with international standards for traceability by providing reliable data.

In the agriculture value chain, producers look for information to improve their productivity, yields and profitability. Digital agriculture services and solutions offer a vehicle to achieve this through better access to productivity enhancing information and technologies and market access. Information on pricing of agricultural products (inputs and outputs) and markets, providing logistics, storage information services and in some cases access to virtual trading floors are much needed.

A major factor in smarter supply chains is the development of eCommerce. With the interconnectedness of the Internet at society's fingertips, consumers are able to access and order easily from their own home or office, increasing the demand of products around the world. If business is easy and accessible, customers are more likely to utilize it. While this new interaction model presents its own set of challenges in keeping up with the demand of commodities, its benefit to agriculture far outweighs the cost. Online supply chain management streamlines inventory

administration, warehouse strategies and distribution practices, all fueled by the demand-driven business model that results from eCommerce.

The digital landscape of the industry also boosts internal and external communications throughout the supply chain. Producers are able to interface quickly and customers are digitally connected to the products they are purchasing through innovative technology like blockchain. These solutions ensure that each stage of operation is visible, which subsequently increases quality expectations and cuts down on error time. Digital access promotes digital solutions in any industry, and the new standard of instant access to information, delivery status and timelines is a direct result of a digitized supply chain.

Not only can customers and producers access information instantly, but the production processes also move more quickly in a digitized supply chain. Through online platforms, data moves faster, and communication efforts are optimized.

Lack of interest on the part of municipalities. Most municipalities do not have the "human capital" to implement digital services. There is a lack of knowledge about the opportunities offered by digital services for sustainable rural development. Ineffective use of EU funds for the introduction of digital services due to low awareness and lack of administrative capacity in municipalities.

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SMALL FARMS DEVELOPMENT AND SUPPORT WITHIN EU CAP

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ABSTRACT

The research is focused on the actual problem of opportunities for small farms development, given their socio-economic significance for the agriculture and rural areas in Bulgaria.

The article's purpose is to outline the EU CAP impact on small farms development to reveal structural changes and to assess their economic situation.

The weaknesses of EU CAP regarding small farm in the program perio 2007-2013 have been mentioned and their problems and necessities have been outlined. The research results show convincingly that the predominantly small farm sizes and the insufficient technical and technologic insurance embarrass the use of prouction factors. The lower support levels predetermine the lower economic results, compared to the average for the country.

A preliminary assessment of support impact within the Thematic RDP sub-program (2014-2020) on small farms development has been made.

Key words: small farms, CAP, development, economic status

INTRODUCTION

In Bulgaria, the significant role and importance of small-scale farms, linked on the one hand - with their dominant share in the overall structure of agricultural units and on the sustainable development of rural areas - is maintained. The research shows that at the present stage, despite the reduction of small farms and the serious problems they face: they have great socio-economic importance and role in the sustainable development of rural areas in Bulgaria; maintain the viability in rural areas especially, in mountain and semi-mountain areas and border areas; play a significant role in supporting household income; play an essential role in agricultural land management, environmental protection, biodiversity and the landscape.

The aim of this article is to outline the socio-economic importance of small farms for the sustainable development of rural areas, to reveal structural changes and to assess the impact of the implementation of the Common Agricultural Policy.

The following scientific methods were used in the study: analysis and synthesis, comparative analysis; the so-called desk research, statistical grouping method, survey method, and graphical method.

DEFINITION OF SMALL FARM

In the programming period 2014-2020, according to the regulatory documents, the European Commission enables each Member State, according to the structure and condition of agricultural holdings, to define and adopt a national definition of smallholding. In the definition of small holdings, Bulgaria chooses to apply the criterion of economic size of holdings. The economic size of the farms is measured in Standard Output (SO) / Standard Production Output (SPO). The standart output of an agricultural product (crop or livestock), abbriviated as SO, is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock. There is a regional SO coefficent for each product, as an average value over a reference period (5 years, except for the SO 2004 coefficent calculated using the average of 3 years). The sum of all the SO per hectare and per head of livestock in a farm is a measure of its overall economic size, expressed in euro. SO does not include direct payments, value added tax and other taxes.

According to these criteria, Bulgaria adopts a national definition of small business - an economic size of EUR 2,000 to EUR 7, 999, as measured in the SO.

DEVELOPMENT OF SMALL FARMS

The number of small holdings, according to the national definition, is 78 960, which is 21.2% of all holdings in Bulgaria. Almost all small holdings operate as individuals or sole traders, with only 520 holdings having legal personality. Of all small holdings, 69.3% are up to € 3,999 and the remaining 30.7% are from € 4,000 to € 7,999.

Between 2007 - 2016, the number of small holdings decreased significantly by about 41,000, or 40.3%, with a slight increase in the number of small holdings observed in the last year (2016) of the survey. (Table 1).

Table 1. Dynamics in the number of small farms

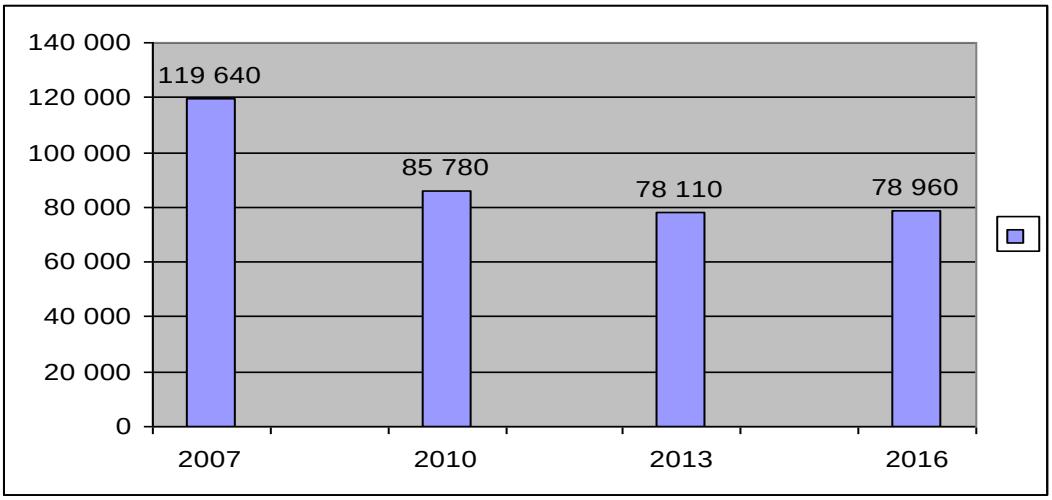
Years	**2007**	**2010**	**2013**	**2016**
Number of farms	119 640	85 780	78 110	78 960
Average size of UAA per farm, ha	4,9	4,8	4,1	3,9

Source: FADN, EC 2007-2016

A comparative analysis between the two groups of small farms shows that the reduction processes in small farms with lower economic potential are more intensive - up to EUR 4,000 SP. The slight increase in the number of farms with an economic size EUR 4000-7999 in the period 2010-2016

indicates that some of the smaller farms have moved to the higher group by increasing their economic potential.

Fig. 1. Dynamics of farm number in the period 2007-2016



Source: FADN 2007-2016

The utilized agricultural area in small farms is 203 930 ha or about 5% of the total in Bulgaria. The distribution of areas by type of use generally corresponds to the national average: 64.3% is arable land, 26.0% is permanent grassland, 8.4% is permanent crops and 1.2% is family gardens. The average utilized agricultural area (UAA) in small farms is 3.9 ha in 2016, significantly smaller than the average size of farms in the country - 20.6 ha.
In the period 2007-2016, the average holding size decreased from 4.9 ha in 2007 to 3.9 ha in 2016 (Table 1). The total standard production output (SPO) in small farms is EUR 228 688 thousand, which is 12.2% of the national one. About 57% is generated by small holdings ranging from EUR 4 000 to EUR 7 999 (Table 2).

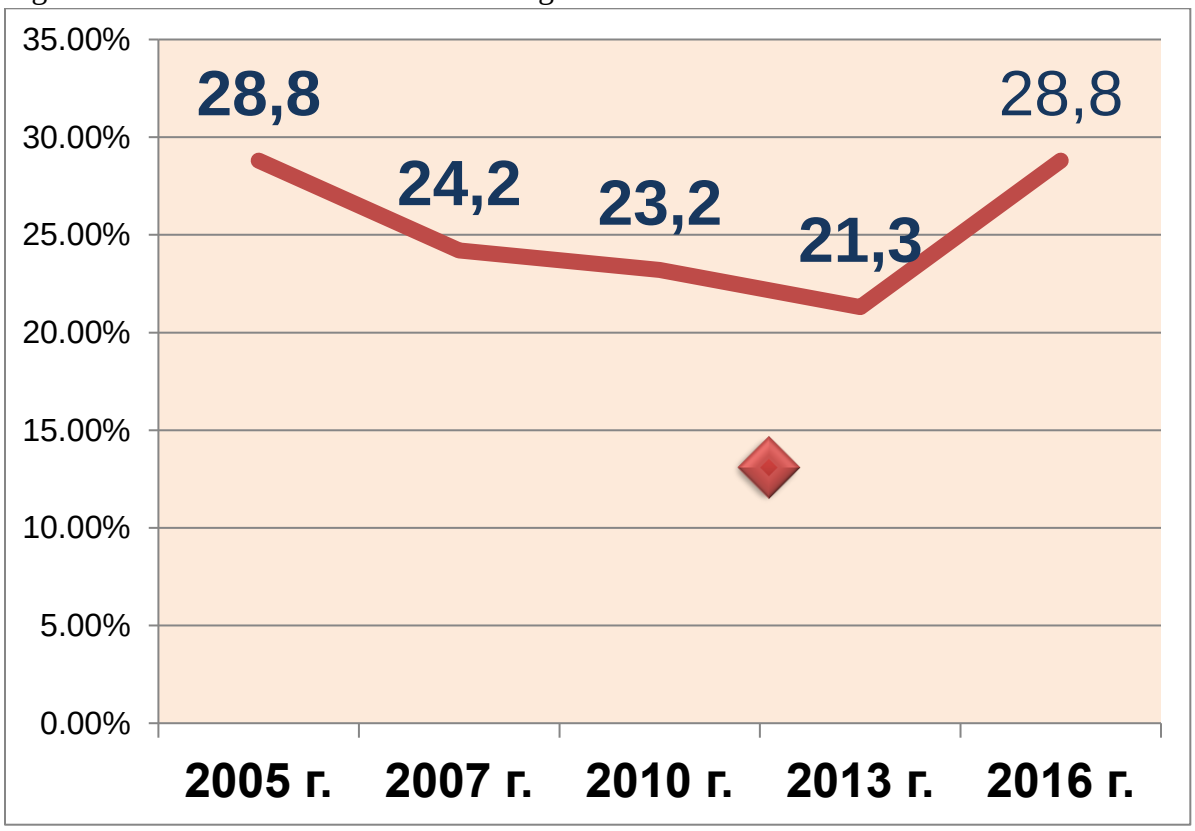
Table 2. Total Standard output in the economic size of the holding (2016)

Economic size	**Small Farms**		**Total standard output**		**Average Economic size**
	numbers	%	(thousands in euro)	%	(euro SPO per holdings)
from 2 000 to 3 999 euro SPO	34 956	69,3	98 642	43,1	2822
from 4 000 to 7 999 euro SPO	22 955	30,7	130 046	56,9	5665
Total	57 911	100,0%	228 688	100,0	8487

Source: Agro-statistics, MAF

As a result of dynamic processes, the structure of agricultural holdings is changing. There is a steady tendency of reducing the relative share of small farms in the overall organizational and economic structure of agriculture - from nearly 29 % in 2005 to 21% in 2013. The results for 2016 are interesting the relative share of small farms is rising to the level of 2005 – 28.8 %. Despite the decrease, small holdings continue to occupy a significant share of the country's holdings (Figure 2).

Fig. 2. Relative share of small farms in organization-economical structure



Source: Agro-statistics, MAFF and own calculation

SPECIALIZATION OF SMALL HOLDINGS

In the structure of small farms in 2016, the highest share is made by mixed-type farms - 40.7%. Specialized holdings for animal production - 32.7%, and specialized crop and mixed crop and livestock farms are just over 26% (Table 3).

Table 3. Structure of small holdings by type of production (2016)

Type of production	**Bulgaria**		**Small farms**		
	number	%	number	% from small farms	% from all farms
Specialized crop farms	79 252	38,5	19 912	26,6	20,1
Specialized farms – animal production	68 402	34,9	20 258	32,7	23,9
Mixed farms	52 701	26,3	17 741	40,7	25,2
Mixed farms – crops	*6 567*	*2,9*	*2 671*	*4,7*	*27,5*
Mixed farms - livestock	*13 356*	*10,5*	*2 754*	*9,7*	*16,6*
Mixed farms-crops and livestock	*32 778*	*12,9*	*12 316*	*26,3*	*30,6*
Unclassified holdings	659	0,3	0	0,0	0,0
Total	253 715	100,0	57 911	100,0	23,2

Source: Agro-statistics, MAFF

In the years after Bulgaria's accession to the EU, there have been significant changes in the structure of small farms by type of production specialization. The number and share of small holdings specializing in animal production and mixed holdings is significantly reduced and the number and share of holdings specialized in crops is increasing. In the period 2007-2016, the number of holdings specializing in crop production increased by 25%, and their share among all holdings - by about 11 percentage points.

The share of small farms in the structure of the various specialized farms shows that they occupy the highest share in vegetable production - over 40%. Small holdings represent a significant proportion of the mixed holdings - 38% and the livestock holdings - 32%. The lowest is the share of small holdings growing permanent crops.

Small farms make a significant contribution to crop production in a number of crops characterized by high labor intensity and low mechanization. Small holdings manage nearly 34% of the country's total tobacco area; followed by areas with potatoes, fresh vegetables, oilseeds (without sunflower) - about 26-27% each; fruit and berry plantations - 22% (according to 2016 data).

The number and share of small holdings that develop non-agricultural activities directly related to the holding is very small, which is typical of all farmers in Bulgaria. The non-agricultural activities that are being developed are mainly services for other farms, processing of agricultural products and aquaculture.

WORK FORCE IN SMALL FARMS

During the analyzed period 2007-2016, employment and the amount of labor input in small farms are almost halved, mainly due to the decrease in the number of farms. The number of permanent employees with agricultural activity decreased from 175 980 in 2010 to 105 326. During the same period, the labor input also decreased - from 205 560 in 2007 to 103 500 AWU in 2016. Small farms are a family business, with almost all employment provided by the family members of the owner. Due to the small size of the holdings, full annual employment cannot be ensured in them, which requires the majority of farmers to supplement their income from other activities. The farm work is the only employment for the owners of 28.4 thousand small farms, whose share is 33.1%. The majority of owners (61.5%) have other basic employment. Less than 5% of owners supplement their farm income with other additional employment.

Despite the reduction in labor force and the amount of labor involved, the labor intensity in small farms remains extremely high. At the end of the analyzed period, with 5% of the total UAA managed, the labor input was over 30%. The labor input per 1 area in small farms - 0.5 AWU / ha is significantly higher, compared to the same ratio for all farms - 0.1 AWU / ha. The data show that the small size of small farms is an obstacle to the rational use of production factors.

Other problems are: lack of agricultural education or qualification of smallholder farmers and their older age. These problems are common to other farms in the country, but are even more pronounced for small farms.

Table 5. Work force in small farms – persons and labor input

	2007	**2010**	**2013**	**2016**
	Persons			
Permanent workforce - total	907 541	738 634	557 408	439 736
Family workforce	856 060	681 466	499 685	375 250
Non family workforce	1 780	57 168	57 723	64 485
	Annual working units			
Permanent workforce - total	568 300	389 107	298 382	242 345
Family workforce	443 750	336 766	245 092	183 362
Non family workforce	50 876	52 341	53 290	58 983
Seasonal workforce	16 153	17 412	21 849	11 602

Source: Agri-statistics, MAFF

During the period 2007-2016, there has been a decrease in employment and labor input in small farms, which is mainly caused by the decrease in the number of farms. Persons employed in farming on small holdings decreased from 119 640 in 2007 to 78 960 in 2016, or 35%. In the same

period, wage labor has seen a 21% decline in wage labor in small farms and a slight decrease in 2016, where wage labor is 1.3 annual units. This can be explained by the slight increase in the number of small holdings in the same year (Table 5).

Table 6. Annual work units, AWU, small-scale labor input 2007-2016

	2007	2010	2013	2016
Annual work units, AWE, labor input	1,7	1,6	1,4	1,3

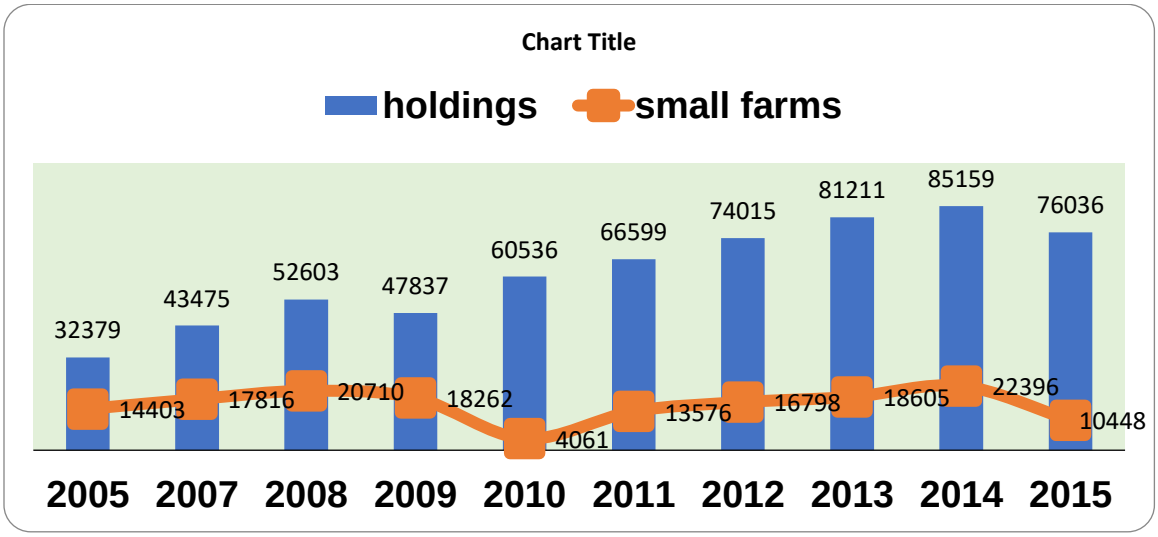
Source: FADN 2007-2016 and own calculations

ECONOMIC SITUATION OF SMALL FARMS

The analysis is based on a sample of agricultural holdings, included for monitoring in the Farm Accountancy Data Network /FADN/, Ministry of agriculture, food and forestry /MAFF/.

For the analyzed period (2005-2015), the data on average gross production level outline different trends. While average of gross production level is in the direction of growth, on a small farms have significant fluctuations, with a tendency to decrease. The comparative analysis shows that as a result of these changes the difference in the gross production level obtained between the two groups of farms is widened. Before Bulgaria's EU membership (2005), the gross production level in small farms was twice lower than the average level for farms in the country. At the end of the analyzed period this difference is more than four times (Figure 3).

Fig. 3. Dynamics of gross production level



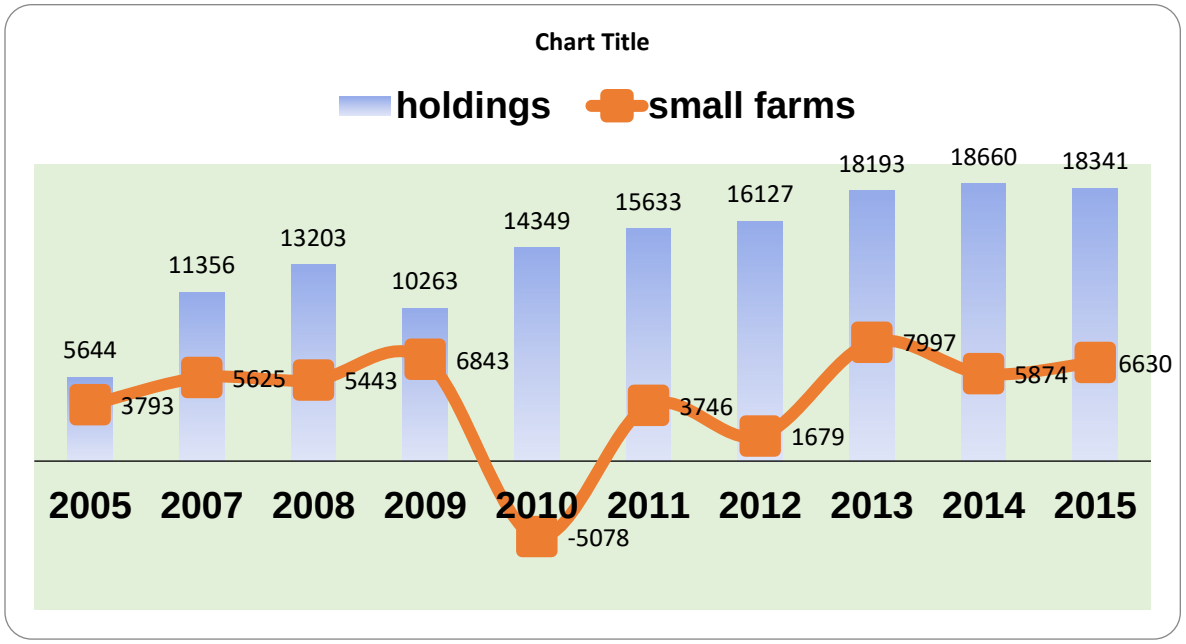
Source: Agro-statistics, MAFF /FADN

The dynamics of net income level shape the differences in the level of the indicator for farms in the country and for small farms. Under CAP conditions, as a result of direct payments received,

the average net income level of farms is higher than before the country's accession to the EU, although with a tendency to increase.

Between 2007 and 2009, the average net income level of small farms tended to increase, in the next period - follows a collapse and incomes lower than 2005. The lower economic potential of small farms also determines a lower net income level than other farms. While in 2005 the difference in average income level between the two groups of farms is not significant, in the CAP conditions this difference widens and in 2012 it reached almost ten times. (Figure 4).

Fig. 4. Dynamics of net income level



Source: Agro-statistics, MAFF /FADN

The conclusion is that the low economic size of small farms, the lack of technical assets make the difficulty to use production factors rationally and efficiently; the lower levels of support also predetermine lower economic performance than farm averages in the country.

The majority of small holdings - 59%, are located mainly in rural areas and the rest in intermediate areas. The data show that small-scale stability and lifestyle preferences make a major contribution to the formation of rural communities and the sustainable development of rural areas. Indicative in this respect are the results of a representative survey of small farms: 85% of them indicate that they have always lived in the same village; 96% have no plans to migrate in the next 5-10 years; for 1/3 of the farmers, agriculture is part of their preferred lifestyle (the survey was conducted in 2012 under the Rural Development Strategy 2014-2020, MAFF). The results of the study show that small farms have important socio-economic importance for the development of agriculture and rural areas in Bulgaria, namely:

- provide employment - they focus a significant part of the agricultural workforce and make a significant contribution to labor-intensive industries;

- support the sustainable and integrated development of rural areas, as agriculture is a major source of livelihood for the rural population. They are important for local community development, cultural heritage and distinctive features;

- they play a significant social role, act as a social safety net that provides livelihoods for many people and complements household incomes, since in rural areas unemployment is highest and incomes are lowest;

- play an essential role in agricultural land management, environmental protection, biodiversity and the landscape. The use of less chemical fertilizers and preparations, lower animal densities help preserve biodiversity.

SUPPORT FOR SMALL FARMS IN THE PERIOD 2014-2020

The support mechanisms for small farms are set out in the Common Agricultural Policy (CAP). For the period 2014-2020, the total budget is EUR 6.8 billion: EUR 4.5 billion under the first pillar of the so-called Direct Payments and EUR 2.3 billion under the second pillar, rural areas.

♦ Direct payment

» Small farm support scheme

For the first time during the current programming period, a separate Small Business Scheme is implemented under the first pillar, which aims at offering a simplified way of supporting a large proportion of beneficiaries of direct payments and reducing the cost of control by the administration. In order to reflect the differences in the structure of the holdings in the individual Member States, the decision to implement the scheme was left to the national governments. The participation of farmers in the scheme is also voluntary, based on their assessment of the benefits associated with the implementation and control of the scheme on the one hand and the amount of support for standard application for all aids for direct payments on the other compared to the subsidy under the scheme. the small farmers scheme, which replaces all other forms of direct support. The support for it is from 500 to 1250 euros. The scheme may benefit smallholder farms of at least 1 ha of agricultural land or 0.5 ha for permanent crops and farms located in mountainous / semi-mountainous areas. The only eligible application year is 2015, each year an application for continued participation in the scheme is submitted. Payments under this scheme replace payments under all other schemes. According to data from the State Fund for Agriculture, 9 599 applications were submitted.

♦ Rural development programme 2014-2020 г.

» Thematic sub programme for development of small farms

In the current programming period, Bulgaria has developed and implemented a special Thematic Sub-Program for the Development of Small Farms.

The purpose of implementing a separate subroutine targeting only small holdings covered by the national definition of small business is to separate this group of holdings from all other holdings, with a separate budget, measures and the opportunity to apply for them. The Thematic sub-program for small farms also aims to significantly simplify the administrative application process and support for farmers. It is envisaged to be fully decentralized in order to shorten project processing and approval times and to extend the scope of consultancy services provided. The budget earmarked for the Thematic sub-program for development of small farms is **EUR 109 925 758, 82**, public funds.

The measures included in the Thematic sub-program for development of small farms are:

- **Measure 4 „Investments in physical assets“**, which unites the so-called investment measures for the modernization of agricultural holdings, processing and adding value to agricultural products, as well as investments related to environmental protection.

- **Measure 6 „Farms and business development“**, which includes a start-up aid package for small farms and investment in non-agricultural activities.

- **Measure 2 „Advisory services, farm management and farm relief services“,** which envisages the extension of small business advisory services as well as the creation of mobile community centers to reach every small farmer.

Priorities for small farms are also foreseen under certain measures of the Rural Development Program (2014-2020), aimed at promoting co-operation and integration in the agricultural and food chains.

The calculations show that the adopted budget, after deduction of the funds under Measure 141, will allow to be supported:

- 3, 000 holdings under Sub-Measure 6.3 "Start-up aid for small farms development activities";

- 1 100 holdings under Sub-Measure 4.1 „Investments in agricultural holdings”;

- 3 500 holdings under Sub-Measure 2.1 „Provision of advisory services to small farmers”;

- probably over 80-90% of the holdings that will use consulting services (3 500) will also apply under Sub-measures 6.3 and 4.1.

The total number of holdings to be supported through investment, start-up assistance and consultation will be around **4000-5000** holdings. The total number is less than the amount of supported farms under individual measures, as part of the farms will receive support under more than one measure. The share of supported farms represents only about **5-6%** of potential beneficiaries (78.9 thousand small holdings in 2013). The smaller amount of the budget under the RDP (2014-2020) limits the amount of funds under the Thematic Sub-Program and greatly narrows the number of supported farms. With this low share of supported small farms, it is expected that no significant changes will occur and trends in farm restructuring will continue. Strongly dualistic

structure of Bulgarian agriculture will be maintained - many small and small farms, few large farm structures and lack of a significant layer of medium farms.
With the large number of potential beneficiaries, the expectations are for increased interest on the Thematic sub-programme for development of small farms, rapid depletion of funds and non-financing of a large part of the submitted projects.

IMPLEMENTATION OF THE THEMATIC SUB-PROGRAMME FOR DEVELOPMENT OF SMALL FARMS UNTILL 01.01.2019 Г.

To the present moment, only two of the selected measures have been implemented under the Thematic Sub-Program: Sub-measure 6.3 "Starting aid for the development of small holdings" and Sub-measure 4.1.2 "Investments in agricultural holdings under the Thematic sub-program for the development of small holdings". Of the aid applications submitted, the largest share was in the fruit and vegetables sector, 49%, followed by 28% from the livestock sector and 23% from mixed holdings.

In the first admission period under sub-measure 6.3 (in 2016), a total of 3 815 applications were submitted for support to the State Fund for Agriculture. Of these, 1 739 applications. were approved with support contracts worth EUR 26 085 000, and 1 643 applications have been rejected because of lack in the define budget. The next sub-metric intake is expected in May 2019.

During the first admission period under sub-measure 4.1.2 (completed at the end of 2018), a total of 837 applications for support were submitted. Applications submitted in the State Fund for Agriculture are in processing
Sub-measure 2.1.2 "Provision Advisory Services to small farms", under this Sub-measure the National Agricultural Advisory Service provides free of charge small-business advisory services, including preparing business plans necessary to apply for the individual sub-measures of the Thematic Sub-program for Small Business Development. Just over 150, 000 consulting services have been provided.
The conclusions of the implementation of the Thematic Sub-Programme so far are: increasing the level of support tailored to the specific needs of small farms; improving human and physical capital, as well as market orientation, will increase the viability and sustainability of small farms; priority support for small holdings in vulnerable sectors will have a positive impact on their development.

SOCIO-ECONOMIC IMPORTANCE OF SMALL FARMS

The socio-economic importance of small farms for the development of agriculture and rural areas can be summarized in the following areas:

• They support the sustainable and integrated development of rural areas. They are important for the development of local communities, cultural heritage and distinctive features. The characteristics of small farms suggest good opportunities for diversification and alternative employment in the local economy. On the basis of diversification in agriculture, in non-agricultural activities (processing, agri-tourism) and outside agriculture contribute to economic growth;

• They play a significant social role, act as a social safety net that feeds many people and complements household incomes, since in rural areas unemployment is highest and incomes are lowest;

• They play an essential role in agricultural land management, environmental protection, biodiversity and the landscape. The use of less chemical fertilizers and preparations, lower animal densities help preserve biodiversity. According to Eurostat data, 20.4% of the holdings are in mountainous and 48.3% in less favored areas. Supporting these farms is essential to delay the process of depopulation in these areas.

CONCLUSION

EU policy and our national stance on small farms must

be clear. They should not be seen as an obstacle to improving the competitiveness of agriculture, and emphasis should be placed on their role in providing public goods. The policy should aim at greater support for small farms in integrated rural development. European and national policies should stimulate:

- association and cooperation of small producers, building integration links with processing plants. Attempts to stimulate the market orientation of small farms should target policies that facilitate their access to the market by reducing transaction costs. Increasing the role of municipalities in providing municipal markets with products from direct sale of farms, improving local infrastructure, in order to facilitate access for farmers and move them to areas for the realization of these direct sales;
- diversification of activities in small farms. In order to survive, they must rely less on agricultural income and diversify their agricultural and non-agricultural activities. This can only be done through rural development, which will make them attractive for non-agricultural activities and provide greater employment opportunities.

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SUCCESSFUL MODELS OF SOCIAL ENTERPRISE IN BULGARIA

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ABSTRACT

Social entrepreneurship is identified at European Union (EU) as a key instrument for regional cohesion and overcoming the problems of poverty and social exclusion. As part of its policy to promote the social economy and social innovation, social entrepreneurship contribute to achieving the strategic goals set in 2020.

Successful social enterprise is an operating company with a social cause, a positive financial result, which is independent in taking decisions does not depend entirely on external financing, a clear perspective for development and achieving social goals.

Keywords*: social entrepreneurship, social enterprise, social economy, public policy.*

INTRODUCTION

The promotion of innovative ideas in public policy is crucial to support the values of an active-oriented problem solving social system. These views underlie the ongoing social reforms in various countries and focus on the development of social entrepreneurship and the role of social entrepreneurs. An understanding is underlined that namely social entrepreneurs have the capability through localization of usable resources - human capital, buildings and equipment, to find flexible approaches to satisfy unmet social needs (Bencheva, Stoeva and Todorova, 2018).

Social entrepreneurship is identified at European Union (EU) as a key instrument for regional cohesion and overcoming the problems of poverty and social exclusion. As part of its policy to promote the social economy and social innovation, social entrepreneurship contribute to achieving the strategic goals set in 2020 (Terziev, et al. 2016a).

BARRIERS TO GROWTH IN SOCIAL ENTERPRISING

Study the problems of different types of social enterprises in Bulgaria (fig. 1) identifies a wide range of problem areas that are determined primarily by the type of enterprise.Resourcing (Terziev, et al. 2016b; 2016c):

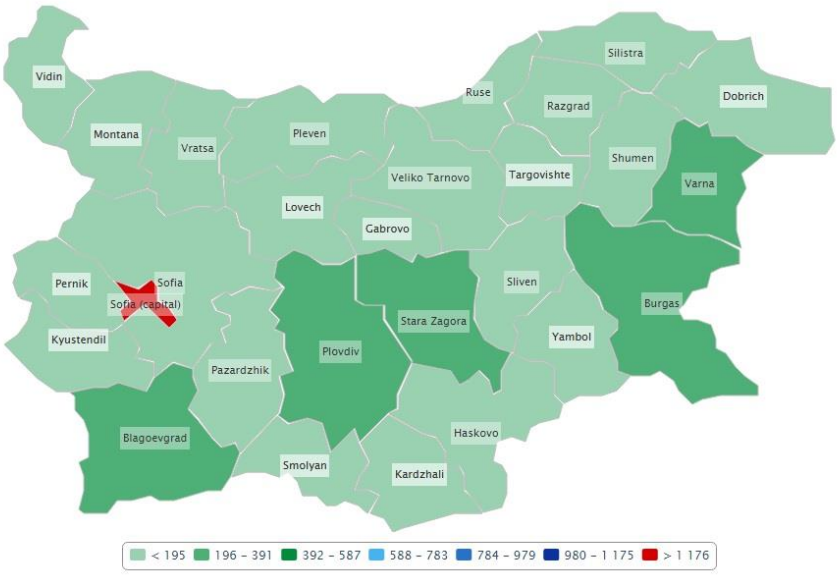
Lack of adequate financing, supporting social enterprises -. this is a problem that affects virtually all social enterprises and refers to the initial and working capital financing of activities of social enterprises;

Lack of resources for starting a business - along with financing, there are several components to start a business that is usually absent in The majority of start-up social enterprises (and entrepreneurial and social type), buildings / land equipment;

Lack of managerial and marketing experience - this is the problem of the NGO sector, which generally attracts employees with different profile than is necessary for the realization of

managerial and marketing positions. As far as the civil sector is the most active in the creation of social enterprises help in this area is becoming a necessity.

Figure 1: Number of social enterprises by region.



Disadvantages of project approach

This is a problem that affects mostly companies with dominant social cause. The motivation of those businesses that are candidates for project finance is different from that of individual entrepreneurs. It could say that the latter are adequately business oriented, while the first is often lacking management skills and vision development.

- The project financing model suffers from a chronic lack of resistance:
- Slow, cumbersome procedures in the administration of projects

Problems with the environment

- Lack of systematic and deliberate policy at the national level - entrepreneurs ascertain a passive and erratic behavior of the state and the responsible institutions
- Lack of legislation - a problem already described above
- Problems with the institutions - there is no real understanding of the role of social enterprises, lack of cooperation from the institutions involved:

Personnel problems

- Existing companies from entrepreneurial type (mostly specialized enterprises for people with disabilities) often have problems finding and training suitable staff - on the one hand because of the attitude they have inflated expectations of the employer to provide them work without itself country are motivated to protect their working position, appropriately qualified and willing to work. On the other hand employers specialized enterprises say that people with disabilities cannot be equally operable and effective as people without disabilities:
- Trap aid - interviewed employers of people with disabilities describe cases in which persons with disabilities who apply for jobs no motivation and quit. The reason is that getting enough aid and therefore have no incentive to work.

Image of social enterprises

Overall, on established social enterprises with a long history, such as specialized enterprises for people with disabilities lacking any evidence of hostility or discrimination against this vulnerable group.

However, the study found that among local communities in smaller cities concerning companies that are emerging or have a short story still exists, discrimination against people with disabilities - are treated not as equal individuals used offensive derogatory qualifications.

Governors functioning specialized social enterprises operating in a competitive market environment, share fears of spreading the rumor that their staff is people with disabilities. According to them because of existing prejudices that still alienating some of their customers, ie have a direct negative effect on their business.

Successful models of social enterprise in Bulgaria

During the interview, social entrepreneurs were asked to describe a successful social enterprise. In most cases using this technique they design their own problems and resolve them through the construction of "ideal type". The model for successful social enterprise can be associated with the development phase of the corresponding type of enterprise - for example, where the entity is still an idea or project, or has occurred recently successful enterprise think in the most idealistic colors with a minimum of specifics - there prevails abstract vision where all are happy working in sound and sustainable enterprises. Accordingly, the opposite pole are companies with experience and history behind that really function successfully - there is usually successful enterprise is thought of as "more of the same" whether an increase in personnel, investment, geographic expansion into other regions / cities (Tepavicharova and Bencheva, 2016d).

Another distinguishing feature of successful enterprise is independence, especially in financial terms. There are many examples where operating companies have certain financial relationships - from municipal budgets (in the case of companies that are part of municipal structures) of project financing, which is unsustainable as far as with an unpredictable result from donors who would also may terminate the funding.

SOCIAL ENTREPRENEURSHIP ENABLERS

National policies to promote social enterprises should provide concrete measures regardless of their nature (legal, financial, administrative) must comply and achieve as a result those principles:

Promotion and sustainability

- Support for social entrepreneurship should include the release of public funds to support the activities of social enterprises to deal with social problems;
- Planning objectives, procedures and expected results in the provision of public resources to support social enterprises should be based on periodic assessment of the environment, taking into account the peculiarities established at a time models and practices and their potential to work towards social objectives

Equal treatment and reduce the administrative burden

- Provide a package of incentives available for all forms of social enterprises;
- Anticipate fast and affordable administrative procedures;

Effectiveness and efficiency

- Implementation of programs and measures after analyzing the needs consistency and adequacy of goals;

- Relevance of inputs to the result - a clear assessment of the financial and social result

Coordination and decentralization

- Establishment of mechanisms for the participation of social enterprises in the planning and evaluation of policy for social entrepreneurship at national level;
- Creation of conditions for development of social entrepreneurship at the local level, according to the specificities and the needs of the territory by involving the municipalities in this process (in local and regional strategies).

Solidarity and Partnership

- Creation of conditions for cooperation, consultations, open dialogue and sharing responsibility among all stakeholders.

CONCLUSIONS

Social entrepreneurship is a concept that allows the creation of alternative models for doing business that are market-oriented and also deliver a social good. Social enterprises integrate all parties in the free market - workers and employees, employers, investors, consumers and others. The promoting of the concept of social entrepreneurship is of a business activity, oriented not only to maximizing profit, but to achieving results related to the welfare of the whole community and to certain socially disadvantaged groups (Terziev, et al. 2020a; 2020b).

The development of organizations, driven by an entrepreneurial spirit but focused on social objectives, is a trend that can be observed in countries with different levels of economic development and different legal systems. The aforesaid is mainly explained by the factors of supply and demand for the services which social enterprises provide. As to the demand, it can be said that in recent years there has been an extensive growth and diversification of needs. This is the result of the interaction of various factors, including changing patterns of behavior and lifestyle, combined with the transformation of the social security systems (Terziev, et al. 2020c; 2020d).

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DEVELOPMENT TRENDS IN BULGARIAN VEGETABLE PRODUCTION

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INTRODUCTION

Dynamic structural changes are taking place in Bulgarian agriculture, accelerating mainly under the influence of the EU's Common Agricultural Policy (CAP). In general, the implementation of the CAP has an overall positive impact on the economic situation in the sector "Agriculture" in Bulgaria. At the same time, a detailed historical analysis highlights some structural changes at sub-sectoral and sectoral levels in this sector. The relations between crop production and animal husbandry are changing, changes in the production structure of agricultural production in sectoral terms are ascertained. Along with the positive trends, the implementation of the European policy, intended for a higher economic, technological and market level of agriculture, raises many problems. In a number of sectors of agriculture (among which is vegetable production), in which Bulgaria has had competitive advantages, there are trends of drastic decline in production and our country from a net exporter becomes an importer of these products. In the conditions of application of the single area payment scheme / SAPS /, Yovchevska (2015) defines the indicated sector in Bulgaria as vulnerable.

In the context of the EU CAP, the Vegetable Production sector is extremely difficult to develop its production and economic potential. In the changed economic environment, agricultural farms do not have the resources to neutralize the influence of natural and climatic conditions, to withstand competitive pressure and market conditions. The main reasons according to Nikolov, Anastasova, Borisov and Radev (2016) for this are:

- the lack of preparation of the sector for the strong competition on the common European market;

- the predominant share of small agricultural holdings;

- unfair competition from neighboring countries;

- the lack of cooperation;

- the depopulation of the regions and the unattractive working conditions - caused by the labor-intensive nature of the production and the low degree of mechanization.

One of the most important industries that have determined the appearance of Bulgarian agriculture is vegetable production. The current state of Bulgarian vegetable production is extremely unfavorable. The total output of this important sector in many respects is declining progressively. The production areas show a continuous decline in times, and the products produced by Polish production cannot satisfy the consumption of vegetables in our country. The level of average yields is significantly below the average in the EU and in countries from which the country imports. The low average yields are mainly due to the use of extensive technologies in the sector and a ruined hydro-ameliorative system, which puts the production of vegetables depending on the

meteorological conditions over the years. The export of vegetables from our country is growing in quantitative terms, but against the background of the constantly increasing import, the trade balance is negative and Bulgaria is a permanently net importer of vegetables. Agricultural producers specializing in vegetable production are declining, but this is not associated with a large increase in the average size of arable land in the sector. The high technological costs in the production of vegetable crops define the impact of SAPS and national area payments as symbolic. In the case of basic vegetable crops, this support is insignificant against the background of the costs and does not help to reduce them, nor does it lead to a profit. Small producers produce without having sales contracts and do serious market research, which almost always leads to periodic shortages of shortages or oversupply.

Today, the sector faces many problems, the solution of which requires the use of the most modern economic principles and management tools. The need to apply the principles of strategic thinking and regional management approach according to Stoeva and Valcheva (2016) is determined by the specifics of the sector requires many resources that are difficult to provide in modern socio-economic conditions.

The aim of the article is to present and evaluate the main trends in the development of vegetable production in Bulgaria.

MATERIALS AND METHODS

The results of the survey are based on official data provided by the Ministry of Agriculture and Food of the Republic of Bulgaria. The research period covers four years / 2015-2018 /, and 2007. is accepted as a base year. The base year was chosen as the first year of Bulgaria's membership in the EU.

Dynamic analysis was used to analyze the development and change of processes in vegetable production. The nature and strength of the studied processes are determined by the following descriptive indicators: level of development, rate of development with a constant base, average rate of development, average absolute growth.

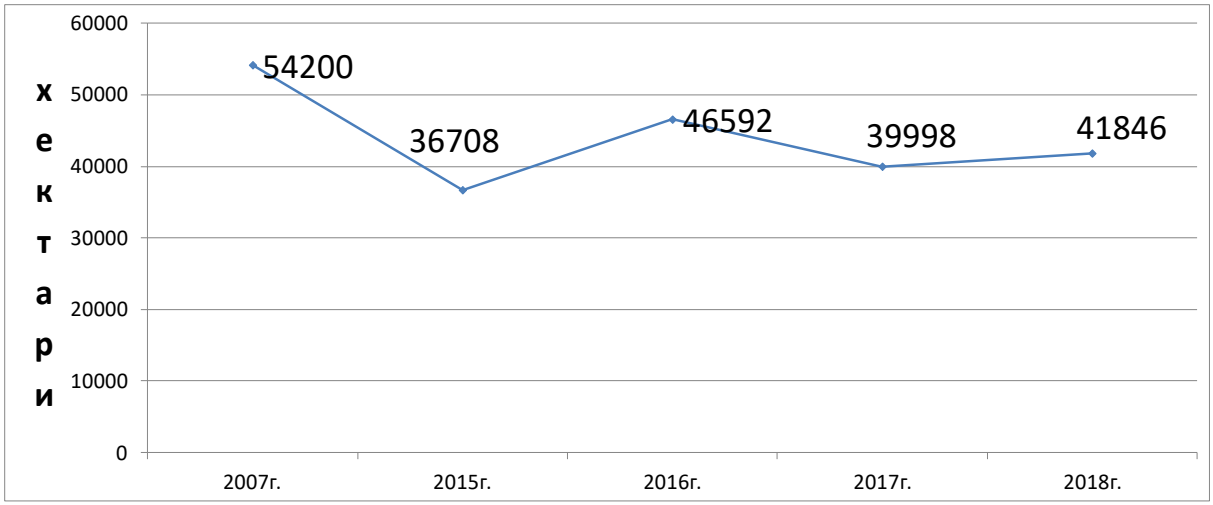
RESULTS

Vegetable production is an important production sector of Bulgarian agriculture. Bulgarian agricultural producers have traditions in this production, and certain regions in the country are recognized as places for growing specific vegetable crops of the highest quality. These areas have suitable soil and climatic conditions and the vegetables grown there are known for their taste. On the other hand, providing the national market with fresh and processed vegetables is an important part of the economic activities in the country, contributing both to the economic development of rural areas and to meeting the ever-increasing demands of the consumer market.

Agricultural production is territorially distributed and requires suitable areas for its implementation. The areas on which vegetables are grown are part of the arable land and the annual

nature of the vegetable crops determines the possibility for strong variation by years of production. During the study period, similar fluctuations were observed, which are typical for this production (see Fig. 1). The areas with vegetables in Bulgaria vary in the range from 36,708 Ha to 46,592 Ha, with an average value of 41,286 Ha. Comparing this value with the reported 54,200 Ha with vegetables in 2007, a decrease in the area with vegetables by more than 10,000 Ha is established within a period slightly longer than 10 years.

Figure 1 Areas with vegetables, total in Bulgaria

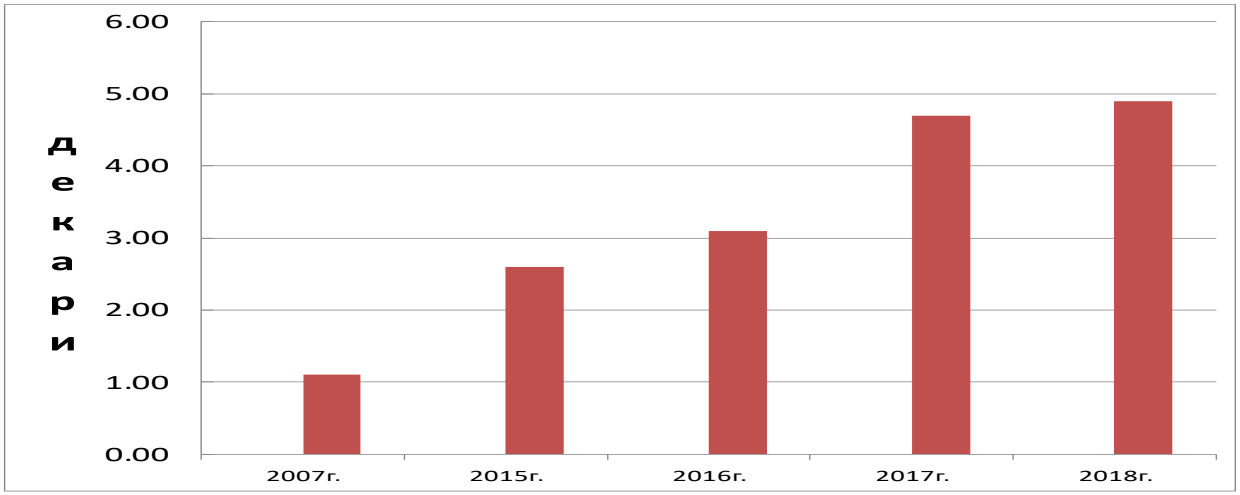


Source: Ministry of agriculture

In fact, 2007 was chosen as the base year for the comparative analysis, as this is the year of the accession of the Republic of Bulgaria to the European Union and the beginning of the implementation of the Common Agricultural Policy (CAP) of the EU in Bulgaria. This allows the data on the development of the sector to be interpreted in the context of the overall support that agriculture receives as an important sector of the national economy. Obviously, during the years of implementation of the CAP in Bulgaria, vegetable production has ceded areas for the development of other agricultural productions. The total area with vegetables decreased by approximately ¼ compared to 2007, which gives grounds to determine that the cultivation of vegetable crops is not a priority for Bulgarian farmers. This finding is a result not only of the sectoral policy, but the influence can be sought on other factors as well, as the process is complex and many elements structure it.

Although the total area with vegetables decreased, during the study period the average area of a farm growing vegetables increased. In 2017 the average area with vegetables in one farm amounts to 4.6 decares, which speaks of consolidation of production (see Fig. 2). Within the studied period the growth rate is almost 2 times, and compared to the base year 2007. is over 4 times. It can be determined that vegetable growers who find a way to be competitive on the market manage to expand their production capacity by increasing the areas on which they grow vegetables.

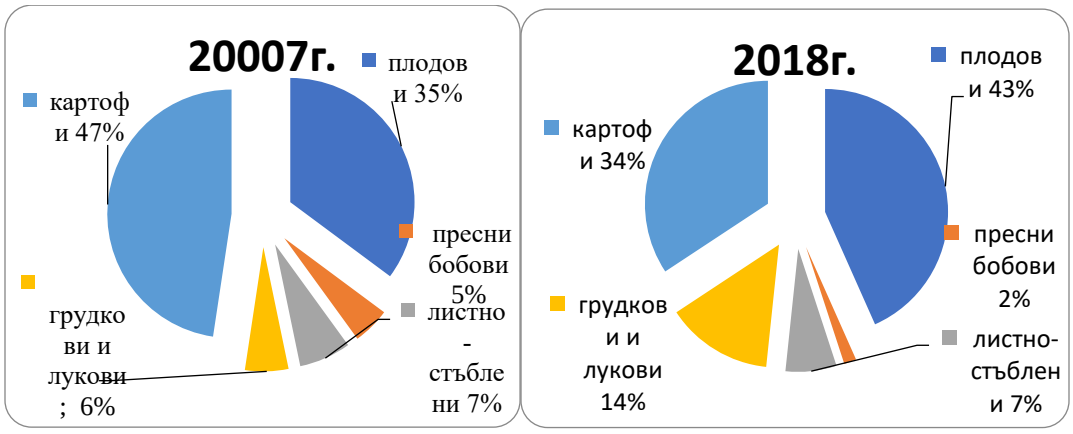
Figure 2. Average size of a vegetable farm



Source: Ministry of agriculture

Another important indicator of the production potential of the Vegetables sector is its structure by groups of vegetables. This indicator also shows the priority products for vegetable producers. With the largest share in 2018. are fruit vegetables, with almost half of the total area with vegetables occupied by this group (see Fig. 3). Fruit vegetables include tomatoes, peppers, cucumbers, eggplants, watermelons, melons and more. This group also includes pumpkins, which during the study period were quite a popular crop for growing. Compared to the base year 2007 the share of fruit and vegetables has increased by almost 10%, but much of this growth comes precisely from the more widespread cultivation of pumpkins by Bulgarian farmers. Another group of vegetables that has increased its share is that of tubers and onions. In 2018 their share amounts to 14% or more than 2 times compared to their share in 2007. Leafy-stem vegetables retain their relative share in the structure of vegetable areas. Reduction of the areas is reported in fresh legumes, as well as in potatoes.

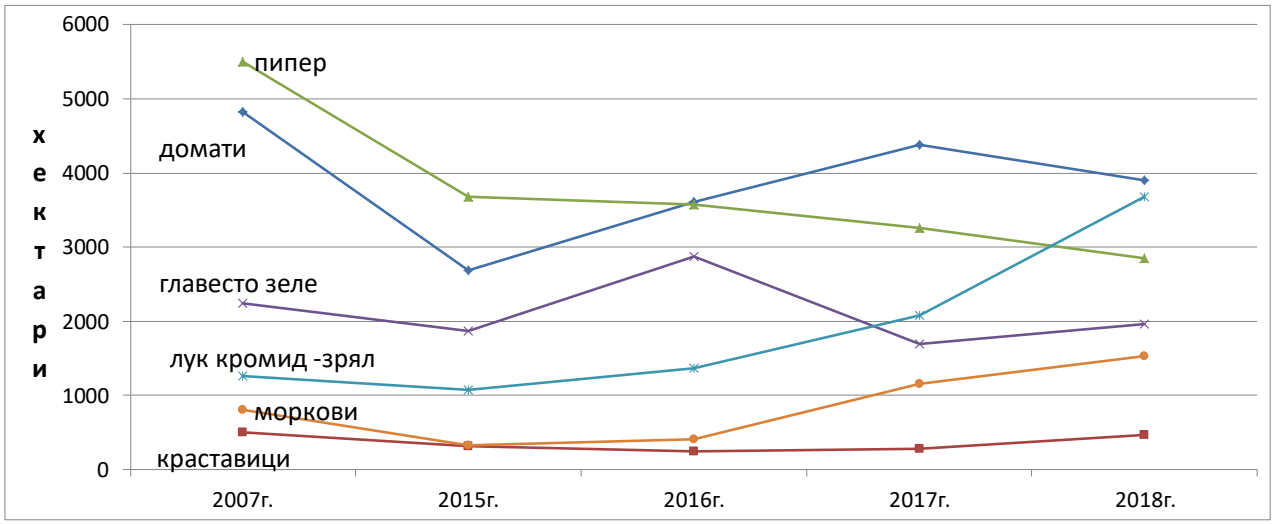
Figure 3 Structure of areas by groups of vegetables



Source: Ministry of agriculture

By types of vegetable crops there are different trends in the size of the areas on which they are grown (see Fig. 4). 6 crops were selected, which are the most popular from a market point of view as fresh vegetables. Two of the crops - carrots and onions - show an increase in the area under which they are grown, as growth is formed in the last 2 years of the study period. This shows that these products have a strong market potential, which Bulgarian farmers are trying to absorb. In the case of head cabbage and cucumbers, there is a variation in the areas, but in general they are stable for the period compared to the base year 2007. In the two most popular vegetable crops - tomatoes and peppers, there is a decrease in their area compared to 2007. But while in the case of tomatoes there is a certain upward trend for the recovery of positions, in the case of pepper the tendency is permanent to reduce the areas. These two vegetable crops are characterized by the need for significant resources for their production, ie. they are intensive crops requiring significant manual labor. Increasing their area is possible only if there is a workforce ready to perform the work processes.

Figure 4 Vegetable areas, 2007-2018

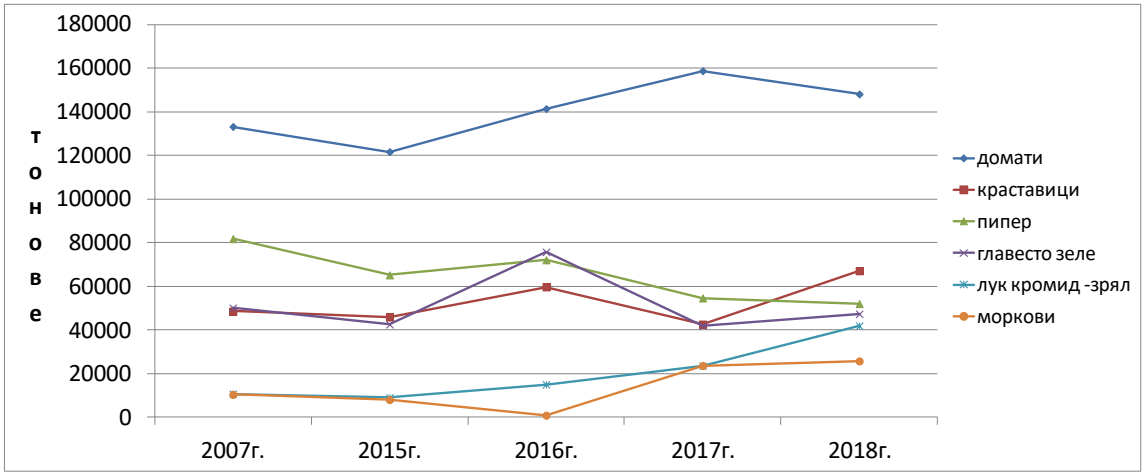


Source: Ministry of agriculture

The areas with vegetable crops are one of the indicators characterizing the production potential of the sector. Another important indicator in this regard is the average yield, which in combination with the area determines the total production. The selected six vegetable crops were analyzed on this indicator within the study period. The data show an increase in total production in 4 crops - tomatoes, cucumbers, onions and carrots (see Fig. 5). In the case of head cabbage, there is a strong variation in the production, but in general it is stable for the period compared to the base year 2007. Only pepper has a permanent reduction in production, but even with it a certain degree of improvement in activity can be determined, as the rate of reduction of production is lower than that of reducing areas. These data show that Bulgarian agricultural producers are improving their production results. Obviously, the quality of the used raw materials and materials increases, as well as the implementation of the agro-technical measures improves. All this determines that

Bulgarian vegetable producers find a place for their products on the market and look for approaches and means to improve their production potential.

Figure 5 Vegetable production, 2007-2018



Source: Ministry of agriculture

The distribution of the production potential of the Vegetables sector on the territory of the Republic of Bulgaria is also of interest. For this purpose, the produced production in the 6 planning regions is considered (see Table 1). The data show a high degree of concentration of production by individual vegetable crops. South-Central region occupies a leading position in the production of tomatoes, peppers, cabbage and onions. As the relative share of the produced production in this region represents close to ¾ of the produced pepper in Bulgaria. Half of the tomatoes, cabbage and onions are produced in this area. The share of the region is also high in the production of cucumbers and potatoes (over 1/3 in both crops). Obviously, the main part of the vegetable producers is concentrated here, which determines the choice of this area as a place for conducting the field research. The southwestern region is a leader in the production of potatoes (nearly half of the national production) and cucumbers (41% of the production in Bulgaria). The south-eastern region has a more significant contribution only in the production of onions, as its relative share amounts to a little over 1/3. In general, it can be determined that vegetable production is typical for Southern Bulgaria, where not only the soil and climatic conditions are suitable for these productions, but also the structure of agricultural holdings (small, intensive holdings) is inherent in the sector. The high degree of concentration of vegetable production is a prerequisite for efficient service of the sector by building and maintaining research and market infrastructure. Here are several scientific institutes working on the creation and adaptation of technologies in vegetable production (the most famous among them is IZK "Maritsa" in Plovdiv), which is the basis for the development of competitive production. Also, the presence of markets for agricultural producers provide an opportunity for vegetables to be offered wholesale and facilitate demand by attracting customers from all over Bulgaria. The market of agricultural producers in the village of Plodovitovo performs precisely such functions, as its location is extremely convenient for a large part of the vegetable producers.

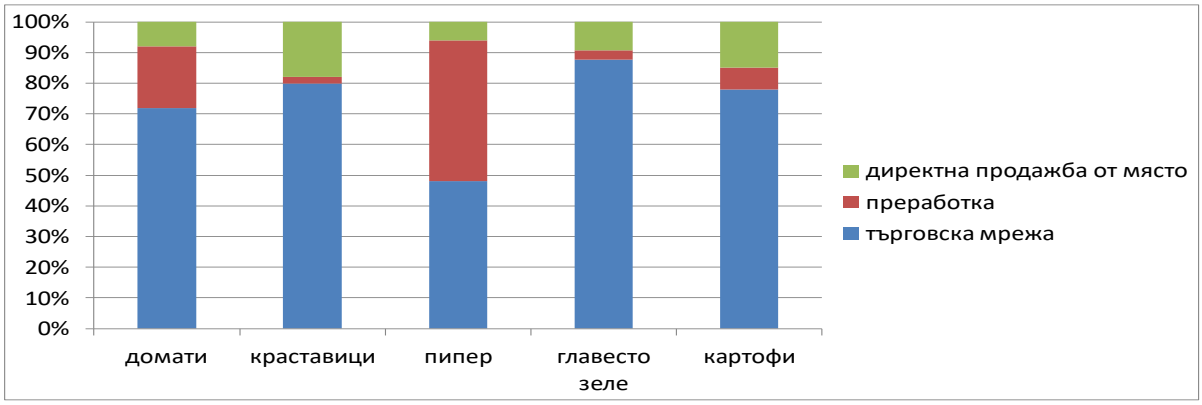
Table 1 Territorial distribution of the production of basic vegetables in 2018.

Regions statistical	Tomatoes		Cucumber		Bell peppers		Cabbage		Onion spring		Potatoes	
	п-во тонове	дял	п-во тонове	дял	п-во тонове	дял	п-во тонове	дял	п-во тонове	дял	п-во тонове	дял
Severozapaden	4 996	3%	4 157	5%	2 288	5%	100	5%	154	4%	503	4%
Severen tsentralen	4 279	3%	3 608	5%	1 253	2%	142	6%	175	5%	470	3%
Severoiztochen	5 709	4%	3 486	5%	2 645	5%	285	15 %	84	2%	251	12 %
	22 688	15 %	5 866	8%	6 745	13 %	192	10 %	1 252	34 %	1 060	7%
Южен централен	74 628	50 %	26 768	36 %	37 967	73 %	963	49 %	1 646	44 %	5 088	36 %
Югозападен	35 777	24 %	30 472	41 %	1 060	2%	279	14 %	364	11 %	6 724	48 %

Source: Ministry of agriculture

The realization of the produced production is an important part of the economic activity of the agricultural producers and has an important contribution to the achievement of good economic results. Vegetables are marketed as fresh vegetables and as processed vegetables. Fresh vegetables are offered through a variety of channels, with statistics collecting data on the quantities sold through the trade network and the quantities for direct sale on the spot. Most of the selected vegetables are sold as fresh (in cucumbers and cabbages their share is nearly 95%), and only the amount of pepper that is processed is close to what is sold as fresh produce. Over ¾ of the produced heads of cabbage, cucumbers, potatoes and tomatoes are sold through the trade network (see Fig. 6). Direct local sales are most often used for cucumbers and potatoes, accounting for approximately 15% of total sales. The low percentages of on-site sales are determined by the fact that the production of vegetables produces large quantities of finished products on a daily basis, which can hardly be realized entirely through on-site sales. Obviously, the sale of vegetables needs the commercial network to reach the end user. In this process, however, various distribution channels can be used to break supply chains and ensure good market positions for vegetables produced in Bulgaria

Figure 6 Directions of sale of vegetables for 2018



Source: Ministry of agriculture

In 2018, 101.7 thousand tons of fresh vegetables were processed, and the finished vegetable production was 88.6 thousand tons. 5.9 thousand tons of vegetable concentrates or other intermediate products were used in the production of finished products, 55% of which are locally produced, 35% are supplies from the EU and the remaining 10% are imported from others.

In 2018, 124 enterprises were engaged in vegetable processing. 89% of the enterprises processing vegetables are registered as commercial companies, and the rest are sole traders and cooperatives. Most of the 64 enterprises are engaged in pepper processing, followed by these processing tomatoes - 49 in number, and a little over ¼ of all enterprises process head cabbage, mushrooms and carrots. The processing companies show the least interest in green peas, which are processed in only 8 companies. Processing companies procure raw materials for their products mainly through deliveries from Bulgarian producers directly or through traders. The share of home-grown vegetables is small, which shows a low degree of closure of the production cycle. However, the processing enterprises manage 329 hectares, supplying 2% of the required raw material from these areas. In 2018 Processed vegetables are mainly used for the production of canned and frozen products, with potatoes forming almost entirely the category "Other products" (see Table 2). The share of canned food (including mushrooms and potatoes) is 57%, frozen vegetables are 11% and concentrates and juices are 10%. These three main items make up 78% of the vegetable production. The finished products of processed vegetables sold in Bulgaria are 53%, the shipments to the EU are 21%, and the exports to third countries are 5%. The share of vegetable production in stock and others is 21%.

Table 2 Finished vegetable products

Year	Freshly packaged	Frozen	Dried	Pickled	Canned	Concentrates and juices	Other produucts
2018	960 тона	9 360 тона	310 тона	2 480 тона	50 410 тона	8 720 тона	14 390 тона
2007	970 тона	16 140 тона	-	1 550 тона	53 120 тона	6 330 тона	8 160 тона

Source: Ministry of agriculture

CONCLUSION

Based on the analysis of vegetable production in Bulgaria, the following more important conclusions and summaries can be made:

• The investments made in the sector are not sufficient to restore its production potential;

• Reduce the area occupied by vegetables;

• The average size of a vegetable farm is increasing;

• The regional concentration and specialization of production is strengthened;

• Low interest in processing Bulgarian vegetables from traditional Bulgarian varieties.

In general, it can be concluded that the market environment and the conducted sectoral policy do not create conditions for stimulating the economic activity in the sector. It is obvious that there are problems in the sector requiring a specially developed policy according to the specific production and economic situation in vegetable production.

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CAPITALIZATION OF DIRECT PAYMENTS

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ABSTRACT

The overall objective of agricultural subsidies is to increase farmers' incomes. In addition, subsidies affect the market for factors of production and they also bring about structural changes. In our research impact of direct support has been analysed on land prices and rents in case of Hungary and Bulgaria. The income annuity was the starting point for the estimation of price of the agricultural land as residual value using the yield calculation method based on data of the Farm Accountancy Data Network (FADN). Our results show much higher rate of capitalization of direct support in land rents in Hungary and in Bulgaria compared to the old Member States indicates the risk of withdrawing considerable agricultural income from production.

Keywords: CAP direct support, capitalization, land price and rent, agricultural income

INTRODUCTION

The overall objective of agricultural subsidies is to increase farmers' incomes. In addition, subsidies affect the market for factors of production and, as we have seen, they also bring about structural changes. SAPS support has been capitalized on land rents in the new Member States. Estimated capitalization (13-25%) is significantly higher than in the old Member States, where Michalek et al. (2014) estimated the average level of capitalization at 6 percent. The effect is economically significant and causes the outflow of income from the sector.

METHOD AND METODOLOGY

The impact of direct aids on land price increases is also higher in the new Member States. The capitalization of subsidies is lower in those Member States where the weight of large-scale farming is more significant, due to the strong bargaining power of farms. Increases in land prices and rents limit land re-location as market entrants and growers face higher investment costs (Herck and Vranken,2013).

As land users do not expect to pay the landowner more than 240 euros per hectare, or about 60 percent of the total amount of the rent, the land users are generally better informed and - they are usually in a stronger bargaining position. The annuity income, which is the starting point for land prices, was estimated as a residual value based on the AKI test farm system using the yield calculation method. In defining the data and method, and in calculations, the following were taken into account:

· Theoretical context: the total income of an agricultural holding is equal to the sum of the income of each factor of production.

· Residual principle: land income, which is equal to the difference between total operating income, labor income and capital income.

· Gross operating income: the amount of the after-tax profit and the amount of the rent for the leased land. Land rent is covered by land income.

· Income from work: In corporate farms, wages and salaries are included as a cost in the after-tax profit, so there is no need to deduct specific labor income. In the case of individual farms, the unpaid family labor wage (the amount corresponding to the minimum wage) must be deducted from the after-tax profit.

· Return on capital: The capital of the plant is the value of the plant's assets less the book value of the land. The return on capital corresponds to the average central bank base rate for the year (lower limit).

· In-line testing: Land income was calculated for a month period using data from Eurostat for AWU[7].

· Financial ratios were calculated at 2010 prices.

· We examined a long period (2008-2018).

The correlation between the factor income, land rental price and direct support are calculated through R^2 values, which is the square of the correlation. In a narrower sense, the term correlation is understood as a synonym for a correlation coefficient ρ, which is a measure of the linear relationship between two random variables x, y, defined as the normalized covariance of the two variables:

$$p = \frac{cov(x, y)}{\sqrt{Var(x).var(y)}}$$

,

If the random variables are independent, they are uncorrelated, i.e. **p = 0**. On the other hand, **p = 1** when the studied random variables are related to a linear dependence This coefficient calculates the share of variation in the dependent variable, which can be attributed to the independent variable. In the social sciences, it is accepted that the correlation has values at a value of r < -0.6 or 0.6 <r, and R^2 has a value above 0.35 <R^2. The quadratic equations are shown graphically. Regression analysis is a set of statistical processes to estimate the relationships between a dependent variable (often called the 'outcome variable') and one or more independent variables (often called 'predictors', 'covariates', or 'features').

RESULTS

By determining the value of land resulting from agricultural utilization, the landowner may acquire the full annuity in the case of total land market liberalization, with the exception of other land market effects (example: real estate market expectations, competition for land, low capitalization

[7] The implicit price index of GDP is used as deflator. Annual work units (AWUs) are defined as full-time equivalent employment (corresponding to the number of full-time equivalent jobs), i.e. as total hours worked divided by the average annual number of hours worked in full-time jobs within the economic territory

of land users, limited availability of credit, etc.). In this case the price of arable land per hectare (on the average of 2018-2018) would be 4550 Euro. At the other extreme, the complete elimination of speculation from the land market would require the land user to purchase land if it yields at least as much income as a lease. As the average interest rate for the purchase of land for 2008-2018 is 3.9 percent, it could offer up to 2980 Euro (almost twice the market price of land) per hectare of arable land.

Table 1. Development of the national average of land income and land rent (2008–2018)

Year	Land		Direct Support [b)]	Market price of arable land	Calculated	
	(factor) income	Rent [a)]			interest rate %[c)]	arable land price [d)]
2018	333.37	240.00	97.86	4705.00	1.25	10586.3
2017	373.54	230.00	98.29	4360.00	1.60	8006.25
2016	313.75	220.00	100.56	3805.00	2.30	3904.35
2015	262.54	210.00	81.95	3660.00	2.50	4000.00
2014	285.79	205.00	136.65	3420.00	3.40	3355.88
2013	266.95	190.00	154.91	2745.00	3.50	3808.57
2012	219.66	170.00	132.22	2735.00	4.50	3600.00
2011	188.12	150.00	112.01	1990.00	5.40	3211.11
2010	164.83	115.00	91.47	1395.00	6.00	2655.00
2009	148.04	105.00	82.98	1560.00	7.20	2644.44
2008	211.12	100.00	65.38	1175.00	5.30	4279.25

Source: National statistic, Eurostat, Bulgarian National Bank – average interest rate for year (calculated)

Investigation of the link between land income and direct aid

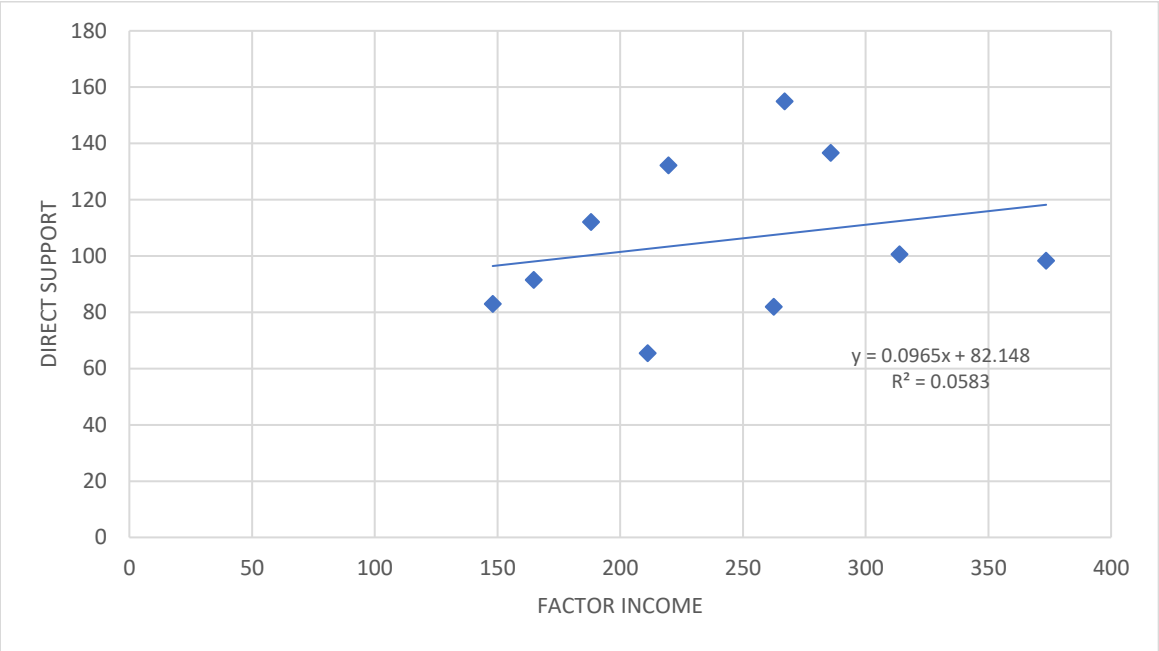
The prices are in Euro or Euro/ha

Note: (a) Land rents; b) SAPS; c) Calculated interest rates; (d) Calculated by interest rates prices of land

Examining the relationship between factor income and direct support

The relationship between direct support (euro thousand) and land income (euro thousand) was determined by linear regression, using the national average data for 2007–2017 (Figure 1). The result of the fitting is the following equation:

Figure 1: Factor income as a function of direct support, 2008–2018



Source: own calculations

Factor income = 0.0583 × direct support + ε

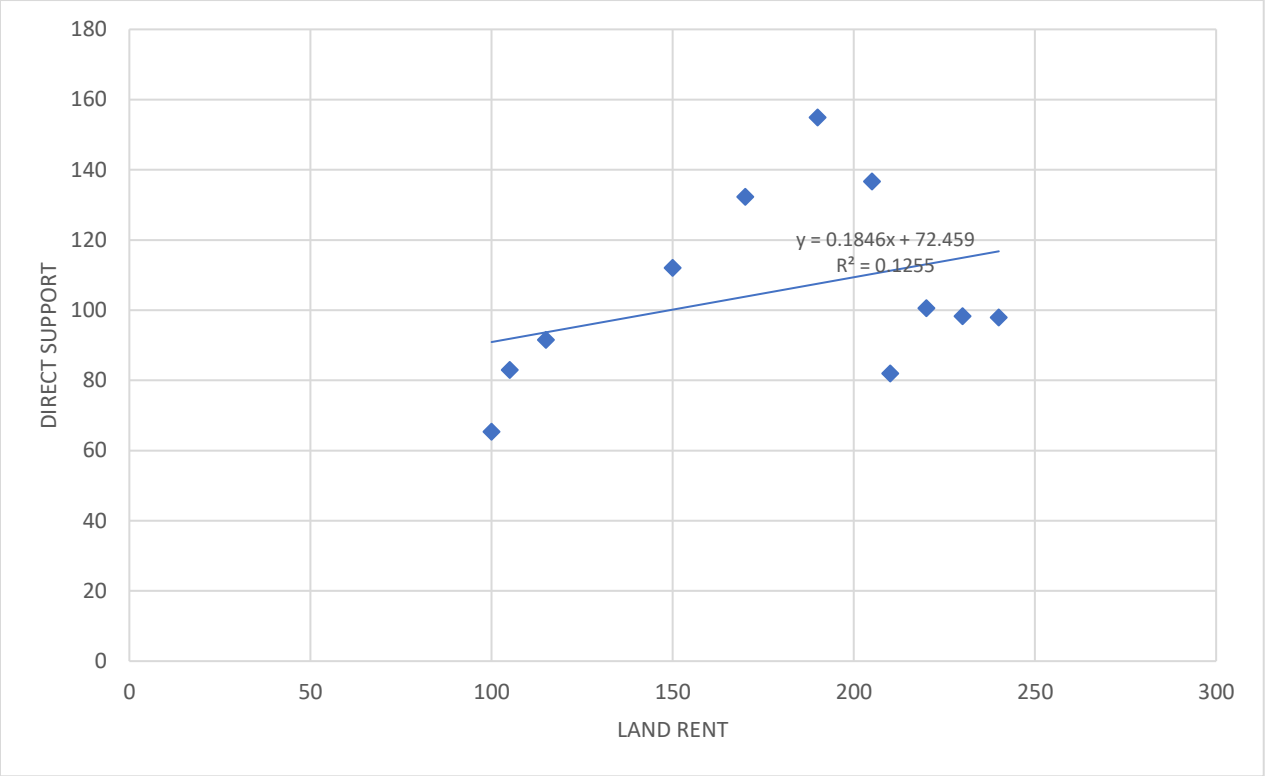
We find that there is barely any connection between the factor income and the direct support during the period. Even if the line shows us that there is a trend of higher double correlation during the period, the correlation is not significant. The direct support in Bulgaria is influencing the factor income but there are other factors that have greater significance. R^2 has a value of 0.0583 that is way below the line that shows any significant correlation.

Examination of the relationship between land rent and direct aid

The relationship between direct aid (in Euro) and the land rent (in Euro) was determined by linear regression, for which we used the national average data for 2008–2018. As a result of the alignment, the following equation results:

Land rent = 0.1255× direct support + ε

Figure 2: Land rent as a function of direct support, 2008–2018



Source: own calculations

In figure 2 the R^2 like in figure 1 show us that the double correlation between land rent and direct support is low. The linear regression shows us that the dependent variables are too scattered and even there is slight escalation of dependance, it is still too low to have any significance.

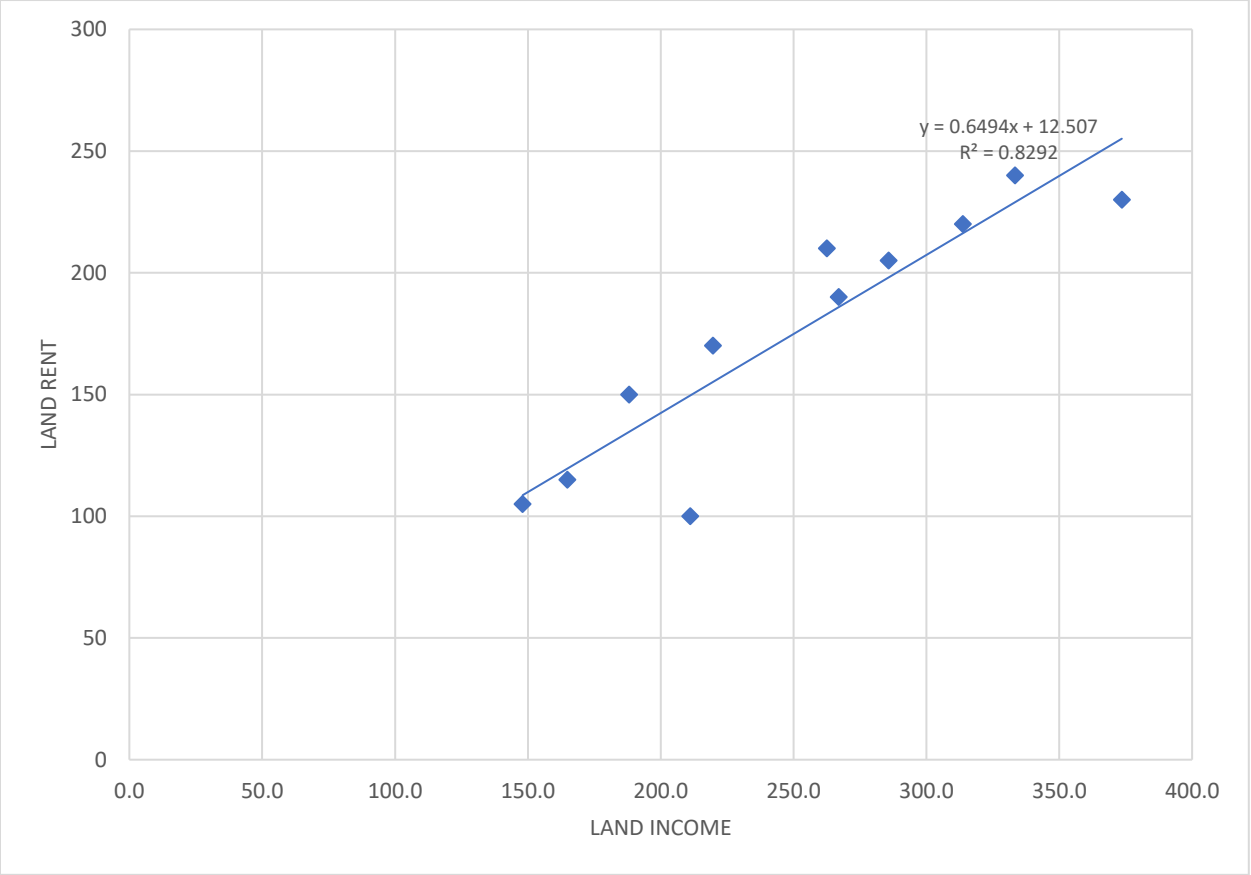
Examining the relationship between land rent and land/factor income

The relation between the land income (euro thousand) and the rent (thousand Euro) was determined by linear regression, for which annual national data for 2008–2018 were used (Figure 3). The result of the fitting is as follows equation:

Land rent = 0.8292 × factor income + ε

The R^2 shows strong double correlation between land rent and the income. The liner regression shows that the factors are tightly correlated in the years. The prince of land rent is strongly dependent on the factor income. Whit higher factor income the price of rent is also getting higher.

Figure 3. Land Lease Depending on Land Income, 2008-2018



Source: own calculations

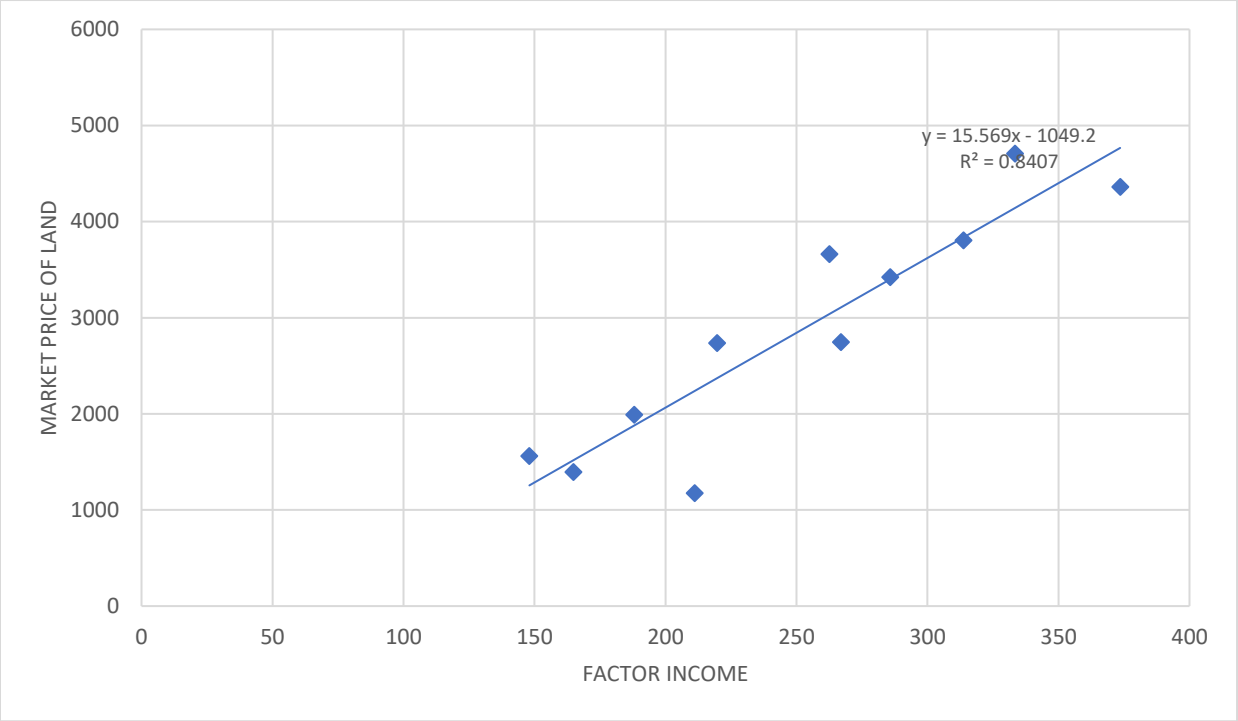
Examining the relationship between the arable land price and the direct support

The relationship between the land income (Euro) and the market arable land (Euro) was determined by linear regression, using the national average data for the years 2008–2018. The result of the fitting is the following equation:

Market arable land price = 0.8407 × land income + ε

We find a strong correlation between arable land market prices and land income. The R^2 has a value of 0.8407 that is grater than the set parameters for our research. That show us that with higher land/factor income the prices are going up.

Figure 4. Market arable prices as a function of land income, 2008–2018



Source: own calculations

The recapitalization of direct aid in the form of land rent Michalek et al. (SAPS estimated at 13-25% in the land lease fee for the EU10) indicates a much higher 65% estimated capitalization rate for the deduction of tax-exempt agricultural income and its withdrawal from agricultural production on average. We are going to examen the case in Bulgaria. The average capitalization calculated for land that is leased is 6.55% and the capitalization for land that is used and you have income and direct support for has an average of 13.88% for the period. That is the same as EU10 countries, but in Bulgaria's case the prices of land and land lease are still below the average for EU countries. From 2008 to 2018 the process in land relationship have somewhat go to be more gradual and the capitalization both when you lease or you use the land for productions has gone down.

Figure 5. Capitalization of land

Year	Capitalization of land (Income and direct support)	Capitalization of land (rent)
2018	9.17%	5.10%
2017	10.82%	5.28%
2016	10.89%	5.78%

2015	9.41%	5.74%
2014	12.35%	5.99%
2013	15.37%	6.92%
2012	12.87%	6.22%
2011	15.08%	7.54%
2010	18.37%	8.24%
2009	14.81%	6.73%
2008	23.53%	8.51%
Average	13.88%	6.55%

Source: own calculations

CONCLUSIONS

The process of capitalization have somewhat gotten similar to this of the EU10 countries in Bulgaria. In Bulgaria the most important factor is the land rent and factor income. In the future the capitalization of land should get to be same as EU10 countries. Lower capitalization is a sign of better and stable land relationships. In Bulgaria the process continuous to be volatile and that is show in the capitalization of land.

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PROTEIN CROPS AND BIOECONOMY IN BULGARIAN AGRICULTURE

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ABSTRACT

In the bioeconomy material/business activity is carried out on the principle of the circular economy. Methods of production are environmentally friendly. The public interest in moving from a linear to a circular economy is an expression of the responsibility of the socium to preserve the human living environment. In this respect, the role of agriculture as a primary sector is an unbeatable factor.
The aim of the study is to assess the importance of protein crop production for the production of high-quality protein feed and to provide economically efficient and environmentally friendly production under the principle of the circular economy on the basis of an economic evaluation of cereals. The timeliness of the study is in line with a number of global and regional sustainability goals. Cultivation of protein crops is a Europe-wide political and strategic solution that provides a number of synergy benefits. Bioeconomic solutions in agriculture are an example of creating value for the realization of economic benefits in society and at the same time to prevent the irreversible depletion of natural resource.

Key words: protein crops, bioeconomy, agriculture, Bulgaria
JEL: O13; Q15; Q57

INTRODUCTION

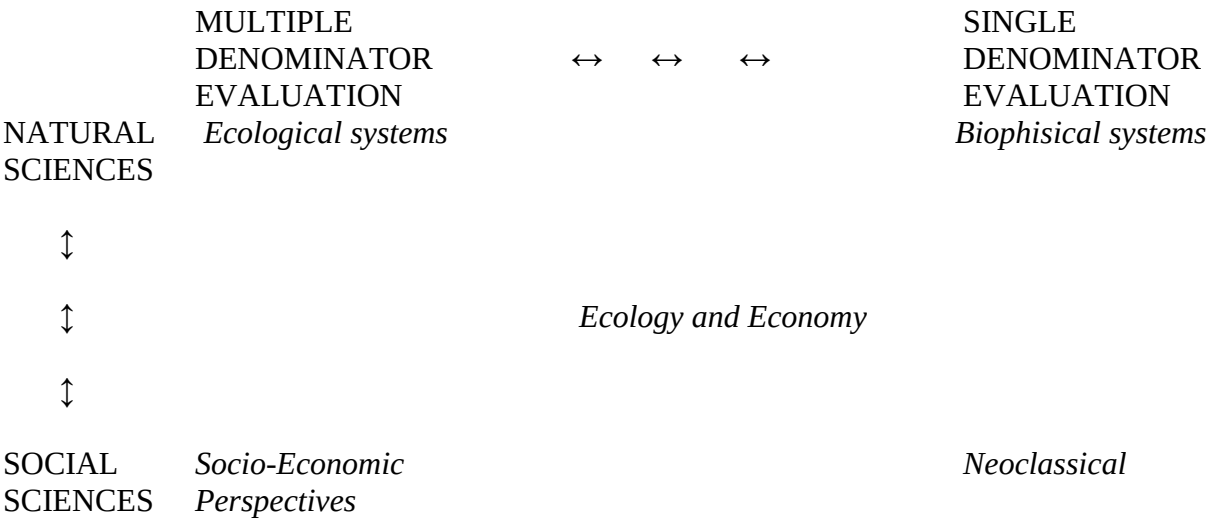
The process of human economic activity is systematically related to biological factors and economic results. This postulate over the years has been a guide for a number of scientific schools and research areas of economics as a social science. The manifestation of problems in the systemic connection biological factors - economic results provokes the scientific community to seek and build new constructs. Knowledge of the nature-individual-socium-nature relations, and deriving their importance over purely scientific research and the economic interest of producers, is not only an element of cognition. Exactly after the accumulated knowledge, a motivated and sustained behaviour is manifested, which guarantees unimpeded assurance of the circulation of substances in the economic activity. At the same time, ensuring the circulation of substances in the economic activity of individuals provides processes and methods of production that are an emanation of the circular economy. Without support of the scientific community socium does not have reasonable and pragmatically oriented solutions.

METHODOLOGICAL FRAMEWORK

Without scientific expertise, the human-society-nature relationship is at risk of imbalance. At the end of the twentieth century, interdisciplinary research was formed, which integrated natural

sciences and social sciences with multiple denominator evaluation and single denominator evaluation.

Figure 1 Adaptation of a conceptual model (Folke and Kaberger 1991, p. 275, citated by Munda Gioseppe 1997)



It is increasingly important for local production of raw materials and agricultural products to be carried out in harmony with local natural and climatic conditions and economic conditions. Compliance with this condition is also a mandatory element in linear and circular economy. Both the sustainable development and the concept of bioeconomy are placed in the coordinate system of the linear and circular economy. This conceptual model (Figure 1) is an appropriate methodological framework for clarifying the importance of Protein crops and bioeconomy in Bulgarian agriculture. Every change in modern environmental improvement processes is being developed in two ways – from society to the individual and from the individual to the society. Communication is sustainable and two-way. The activities society – individual – society is in a systematic connection of functioning and mutual influence. The essentiality of this process also includes opportunities for positive and perspective development of the concept of bioeconomy. The bioeconomy strategy is based on 3 pillars:

– investment in research;

– developing markets and developing competitiveness with bioproducts and consumption of bioproducts;

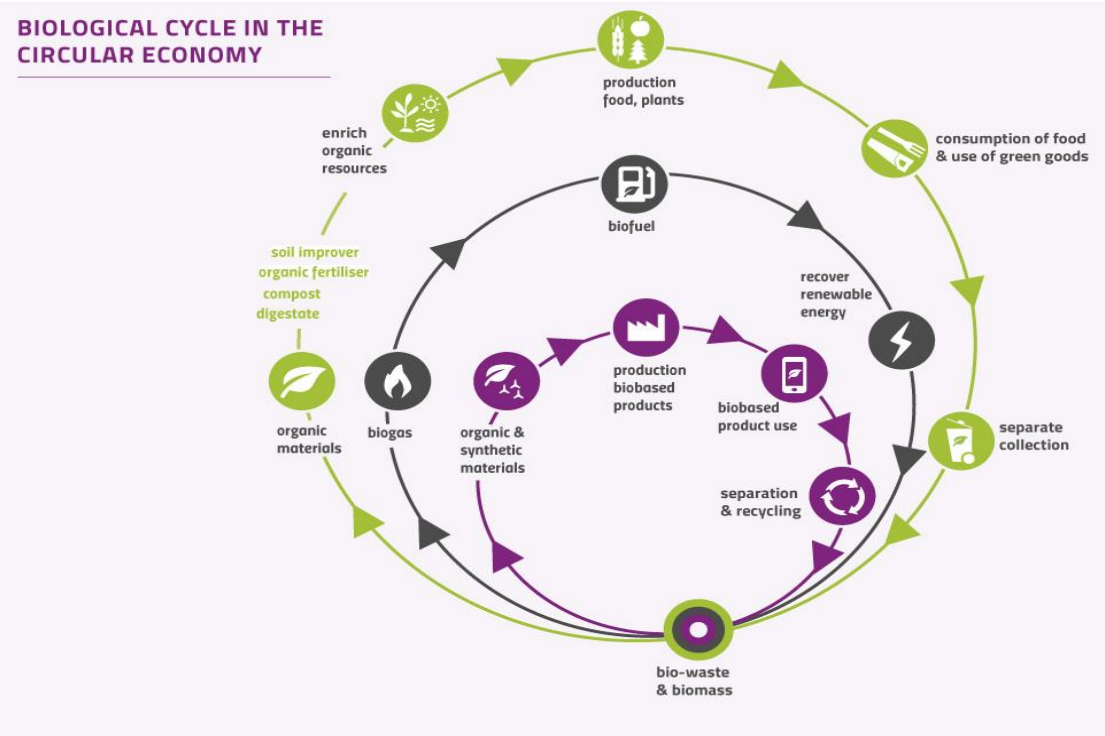
– enhanced policy coordination and involvement of all stakeholders.

New business models was recommended in 2016 Cork Declaration 2.0. In view of the dynamics of the processes related to the development of the bioeconomy, in 2018 the European Commission updated the bioeconomy document of 2013[8]. Emphasis was put on the need for a strategic and systematic approach in order to fully realize the benefits that the bioeconomy brings to the economy and the environment. With the help of PESTLE analyses, the study of the processes of

[8] https://eur-lex.europa.eu/legal-content/BG/TXT/PDF/?uri=CELEX:52018DC0673&from=EN

influence and political, economic, social, technological, legislative and environmental factors in society in the changed social environment is of growing importance (Michailova 2020).

Figure 2 Biological cycle in the circular economy



Source: https://www.compostnetwork.info/policy/circular-economy/

In a circular economy, bio-waste forms a resource for organic soil improvers, fertilisers, growing media component and bio-based products. The carbon and nutrient contents of bio-waste are mainly concentrated in organic fertilisers, soil improvers and growing media, or can be extracted, modified or transformed into a range of different bio-based products, too. All these secondary products can replace fossil-based products such as mineral fertilisers, peat and fossil fuels. After use, the residues of these products can flow back safely into the biosphere, thereby closing carbon and nutrient cycles.

Such an approach should bring together all actors in the value creating chain in order to identify the specifications that need to be taken. In order to ensure and accelerate the implementation of the circular economy models, particular attention need to be paid to systemic crosssectoral challenges, including synergies and compromises. Achieving this goal implies: developing new technologies and adapted production processes, using the potential of value creating chains, market signals and dynamic communication with the creators of new policies to regulate activities to limit human footprint on the natural environment.

RESULTS AND ANALYSIS

An element of applying a circular economy is also ensuring the production of economy's own protein for animal feed. This ensures a positive economic result and guarantees a bio economic effect in stock-breeding. The benefits of legumes are known to solve the protein problem

(Kalaidjieva, 1979). The legumes belong to the Fabaceae or Leguminosae family and rank third among species in the world (Schneider et al., 2015). There is extensive research in Bulgaria (Sachanski and Kirilov, 1988; Naneva, 1990) and sufficient experience in the study and cultivation of both forms of fodder peas (spring – *Pisum sativum* and wintering – *Pisum arvense*). The presence of exceptionally favourable natural and climatic conditions, the combination of suitable soils and the high plasticity of fodder peas as a cultivated plant species, as well as its ability to enrich the soil with nitrogen, are prerequisites for attributing fodder peas to the circular economy. Fodder peas provide a valuable vegetable protein that, if imported, consumes serious financial resources (Table 1).

Table 1. Essential aminoacids in 100 g protein, g

Aminoacids	Lysine	Methionine	Cysteine	Agrinine	Histidine	Isoleucine	Leucine	Glicine	Serine	Phenyl alanine	Tyrosine	Treonin	Tryptophane	Valine
Pea	**7,2**	**1,0**	**1,1**	**9,0**	**2,6**	**4,4**	**13,9**	**4,2**	**4,5**	**4,8**	**3,8**	**3,4**	**1,1**	**5,2**
Soybean	**6,6**	**1,4**	**1,6**	**7,7**	**2,3**	**4,0**	**9,2**	**5,1**		**5,1**		**3.8**	**1,3**	**5,4**

Source: Rates and norms of farm animals feeding and tables of fodder and feeds nutrients. Zemisdat", Sofia, 1984, p. 213

The information in the table above illustrates the significant advantage of fodder peas for grain, the production of which makes it a preferred crop of significant economic importance in the circular economy model, in particular in the bioeconomy. The cultivation of fodder peas for grain is an example of a combination of linear and circular economics, illustrated by the forms of matter movement, the circulation of substances, and the economic importance of plant species not only with the metric measurement of yield, but also with the qualitative characteristics of the nutritional value produced. In animal nutrition, the type and quality of a protein are as important as its quantity. Protein substances are complex compounds, each molecule of which is composed of a considerable number of nitrogenous compounds, called amino acids. The lack or shortage of only one of them reduces the utilization of the ration. The confirmation of the biological value of fodder peas is the presence of fourteen essential amino acids in its grain. The high biological value of the protein makes fodder peas a suitable substitute for other protein sources for dairy cows, sheep, pigs and other animals. The advantage of grain peas is that after grinding it can be fed in the raw state without the need for heat treatment. Fodder peas do not contain any substances harmful to animals and are readily accepted by them.

The approach to growing fodder peas is a technological solution, an element increasingly recognized by the modern bioeconomic paradigm. In the rediscovery of these well-known business practices, significant horizontal and vertical relationships and interactions can be found that are an emanation of deep dialectical relationships. Knowledge of the nature-individual-socium-nature relations, and deriving their importance over purely scientific research and the economic interest of producers, is not only an element of cognition. Exactly after the accumulated knowledge, a motivated and sustained behaviour is manifested, which guarantees unimpeded assurance of the circulation of substances in the economic activity. At the same time, ensuring the circulation of

substances in the economic activity of individuals provides processes and methods of production that are an emanation of the circular economy (Yovchevska 2019). In essence, this is an element of a social model, the validation of which is ensured by new policy decisions and implies the expansion of the role of the circular economy and the expansion of the importance of the bioeconomy.

PROSPECTS FOR THE DEVELOPMENT OF PROTEIN CROPS

The rediscovery of the role of protein crops is determined by policies that are increasingly being implemented in business at the global, regional and local levels.

The future CAP (2021-2027)[9] will continue to provide access to high quality food and strong support for the unique European model of farming with increased focus on the environment and climate, supporting the continued transition to a more sustainable agricultural sector and the development of viable rural areas. New commitments include maintaining humusrich soils, limiting levels of ammonia and nitrogen oxides; crop rotation instead of crop diversification; animal nutrition, which protects animals and humans from antibiotic resistance and various feed additives.

Development of the last few decades is based on political platforms, which are specified in strategies and implemented by regulations, etc. interactive, informative and desirable documents. The political platform of the President of the European Commission includes a number of new substantive panels, the content of which outlines/ tells directions for future European development. One of them is the "European Green Deal", which will include the first European legislative act to set the goal of neutral attitude to climate by 2050 (Ursula von der Leyen, 2019: 5).[10]

In the Living Planet Report 2020 - Bending the curve of biodiversity loss is a synthesized critical point for the future development of mankind: 'At a time when the world is reeling from the deepest global disruption and health crisis of a lifetime, this year's *Living Planet Report* provides unequivocal and alarming evidence that nature is unravelling and that our planet is flashing red warning signs of vital natural systems failure. The *Living Planet Report 2020* clearly outlines how humanity's increasing destruction of nature is having catastrophic impacts not only on wildlife populations but also on human health and all aspects of our lives.'[11]

In 2018, the "Legume Translated" thematic network began collecting existing knowledge and best practices for sustainable legume crop systems and value chains creation. EIP-AGRI organized a protein crop task force, which produced a report.[12] The document is in response to a commitment made by the Commission in the process of adopting Regulation (EU) 2017/2393 to review the demand for and supply of vegetable proteins in the EU and to explore the potential for further development of their cost-effective and environmentally friendly production. In April 2018, the

[9] https://ec.europa.eu/commission/publications/natural-resources-and-environment.

[10] Presented by Ursula von der Leyen on 17.09.2019. Policy guidelines for the next European Commission (2019-2014).https://ec.europa.eu/commission/sites/beta-political/fi les/political-guide-lines-next-commission_en_1.pdf

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European Parliament adopted a report making a founded proposal to adopt a European strategy to promote European protein crops.[13].
Under the new CAP 2021-2027 program and budgetary framework, the development of protein crop production could contribute to the achievement of most of the CAP's 9 objectives (economic, environmental, relevant to climate and socio-economic, including healthier nutrition). To support Member States in defining targeted measures according to an analysis of national priorities and needs, the Commission envisages providing advice on how to include plant proteins in national strategic plans.

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INSTITUTIONAL PROBLEMS IN ORGANIC PRODUCTION IN BULGARIA

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ABSTRACT

With the industrialization of agricultural practices, models of alienation of man from nature and abandonment of traditional methods of land cultivation are established.

Organic farming appears on the agricultural scene as an "extensive" response to these trends against the excessive intensification of the agricultural sector.

The institutional problems in our country in the sector are of diverse nature, which requires an individual approach to each case. The problem is poorly researched and with this article we will try to shed light on this painful question, which directly affects the operators / farmers in this sector.

Key words: Organic farming, Key study, institutional problems

INTRODUCTION

In our country, the problems of organic farming are relatively new for researchers in socio-economic sciences, farmers, agribusiness, interest groups, agricultural administration, politicians and the general public. The few socio-economic studies dedicated to organic farming in agriculture have resulted in: the characterization of environmentally friendly agriculture and its applicability in Bulgaria (Valchovska S., and Kazakova J., 2004); analysis of current trends and challenges of biofuels in the country (Emilova P., and Blazheva V., 2010); analysis of the development of the forms of eco-management in agriculture during the period of transformation in our country (Bashev H., 2008, 2009; Bachev H., 2011; Bachev H. and T. Nanseki, 2008);

According to Mitova (Mitova, D., 2014.) Organic production can be defined as a process in which the final products are obtained from agricultural practices that are economically efficient, environmentally friendly and socially acceptable. "Organic farming is, albeit small, a link in the chain of activities aimed at protecting natural resources and human and animal health" ("organic" agriculture etymologically originates from the Greek word "bios" - life).

The concept of organic farming covers both the ecological and economic dimensions of sustainable agriculture. The social and institutional dimensions of sustainability, although not explicitly included in environmental efficiency measures, remain critical barriers and opportunities on the road to more environmentally efficient agriculture.

Organic farming is a new integrated farming system, based on ecological principles and natural interactions, between the elements of the ecosystem.Целта е да се посочат някои

институционални проблеми, през развитието, обособяването и автономността на сектор Биологично земеделие у нас.

Consequently, to deduce what it is, how it is formed and how this institutional form is changed, reacting to the challenges in this way.

To determine the role of individual and collective actions of groups of participants in the institutionalization process.

METHODOLOGY

In the present study we use (Case study), In the social and economic sciences the case is a research method involving close, in-depth and detailed case study.

Case studies can be single or multiple cases, can include quantitative evidence, rely on multiple sources of evidence and cover current scientific advances.

Case studies have commonly been seen as a fruitful way to come up hypotheses and generate theories (Levy, J. 2014). Case studies are also useful for formulating concepts, which are an important aspect of theory construction (Mahoney, J. 2010). The concepts used in qualitative research will tend to have higher conceptual validity than concepts used in quantitative research (due to conceptual stretching: the unintentional comparison of dissimilar cases) (George, A. L. And Bennett, A. 2005).

It also uses the in-depth interview (also called free or unstructured), which is a direct personal interview conducted by an experienced interviewer with one respondent within about 30 minutes to an hour on pre-established key thematic areas that are explored with open questions and various design techniques.

To explain the action of the participants, emphasis is placed on the interaction between the individual and institutional context through which specific decisions are formed, but also on the broader context built by the cultural and social symbols of the environment in which the operation operates. Thus, the motivational decisions for support and development of the biological sector are considered through the combination of individual, cultural and structural characteristics.

Institutional change affects both rules and norms and actors by objectifying their values and motives, playing the role of internal regulators of their actions.

In the present study, we use an in-depth interview, with farmers selected with different locations, different production lines and sizes to highlight problems across the sector, with the aim of showing that these problems are not biased.

The interviews were conducted exclusively and only voluntarily without any pressure from a third party. Written documents from various institutions were presented, certifying the described cases, correspondence, contracts, certificates, etc. The submitted documents were carefully analyzed, and their content was carefully compared with the current national and European legislation.

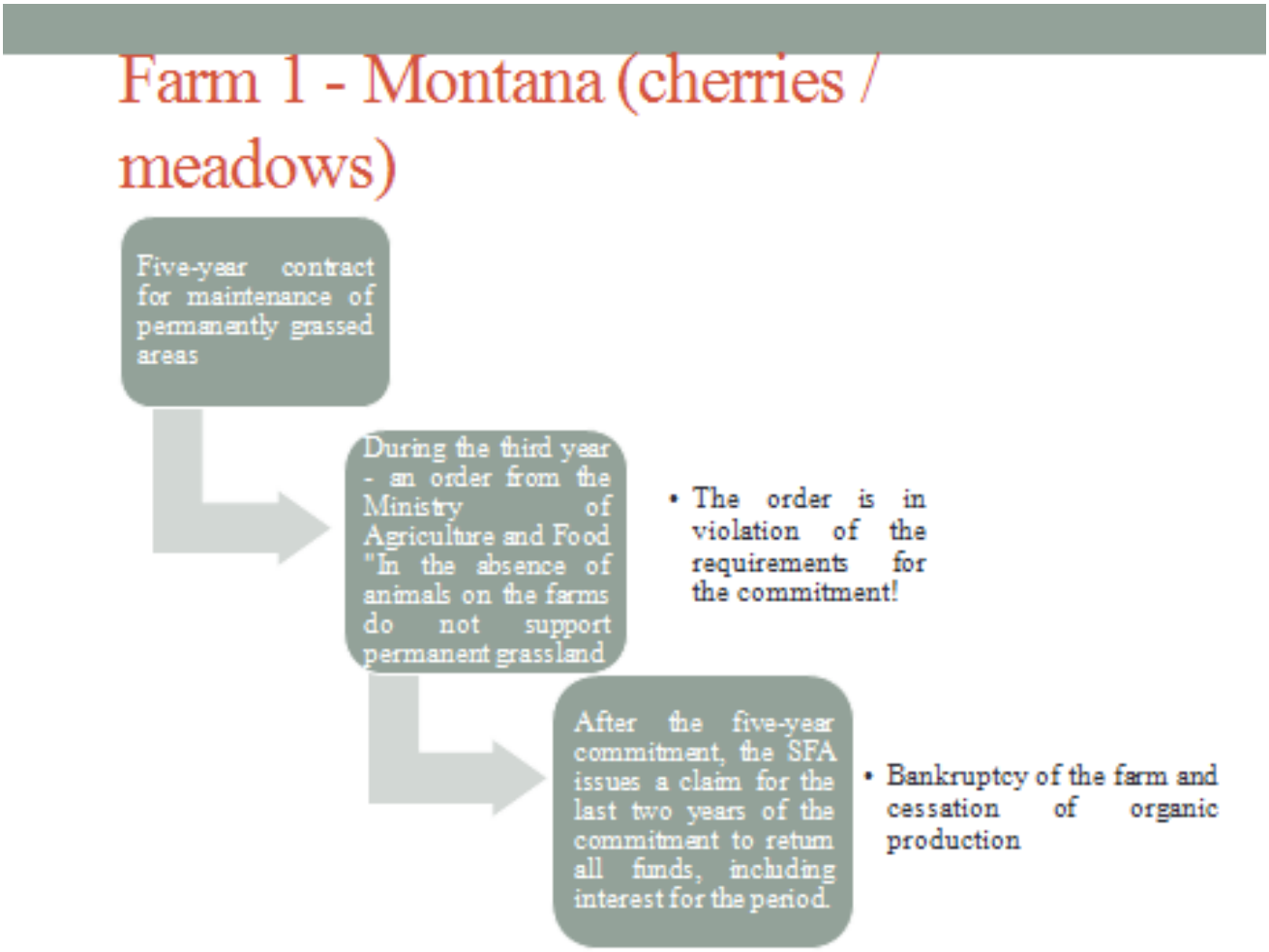
ANALYSIS

Table 1. Interviewed organic farmers

	Farm1	Farm2	Farm3	Farm4
Location	Montana	Yambol	Targovishte	Sofia
Manuf. Direction	Cherries / meadows	Veal	Walnuts	Cereals
Area, ha	65	10	60	1000
Animal Units	-	9	-	-
Contract/Measure	м 214	м 6.3	м 11	м 11
Claim from SFA, Euro	6,000	25,000	32,000	250,000
Problems	Institutional	Institutional	Institutional	Institutional

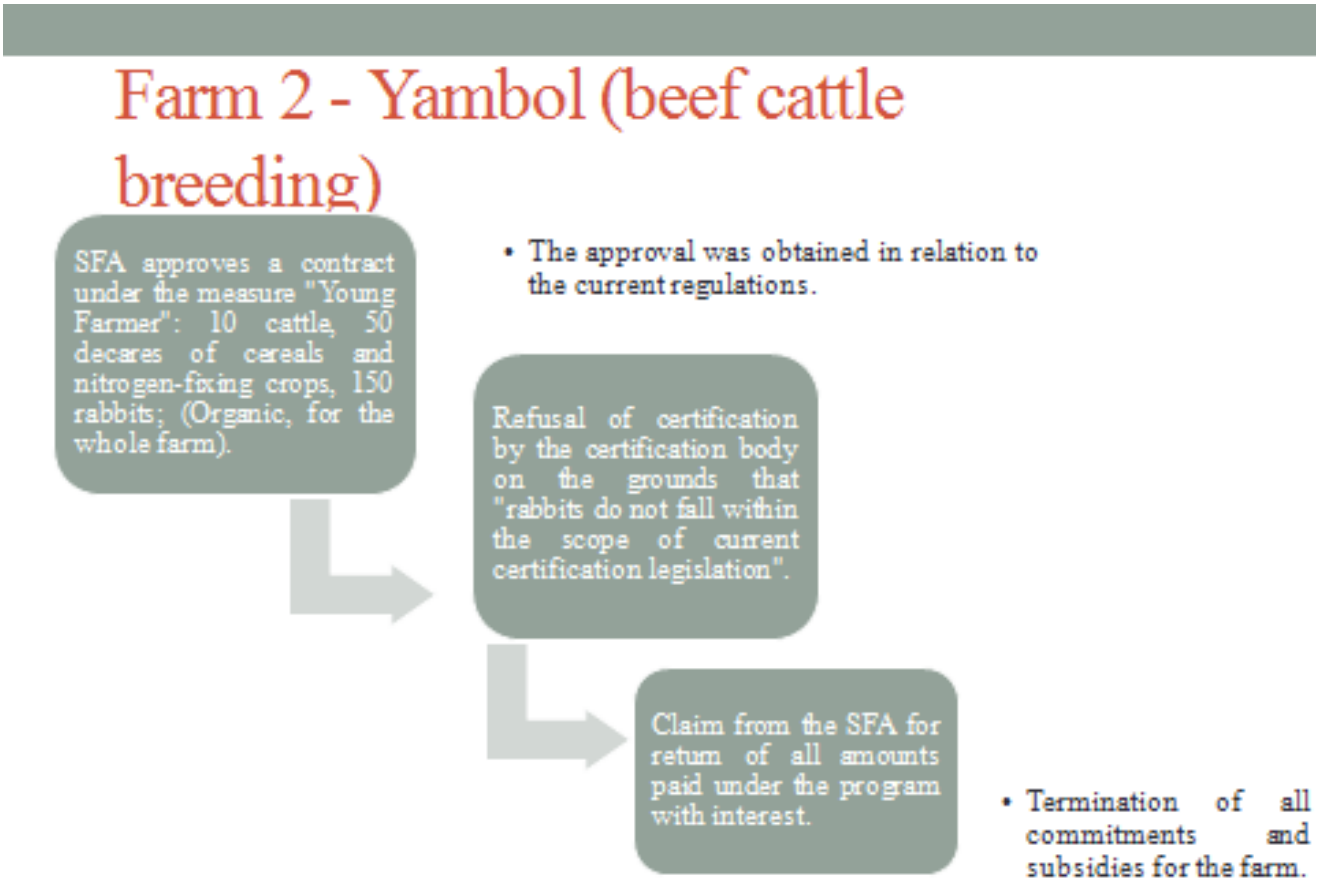
Source: Own research

Scheme 1: Case 1



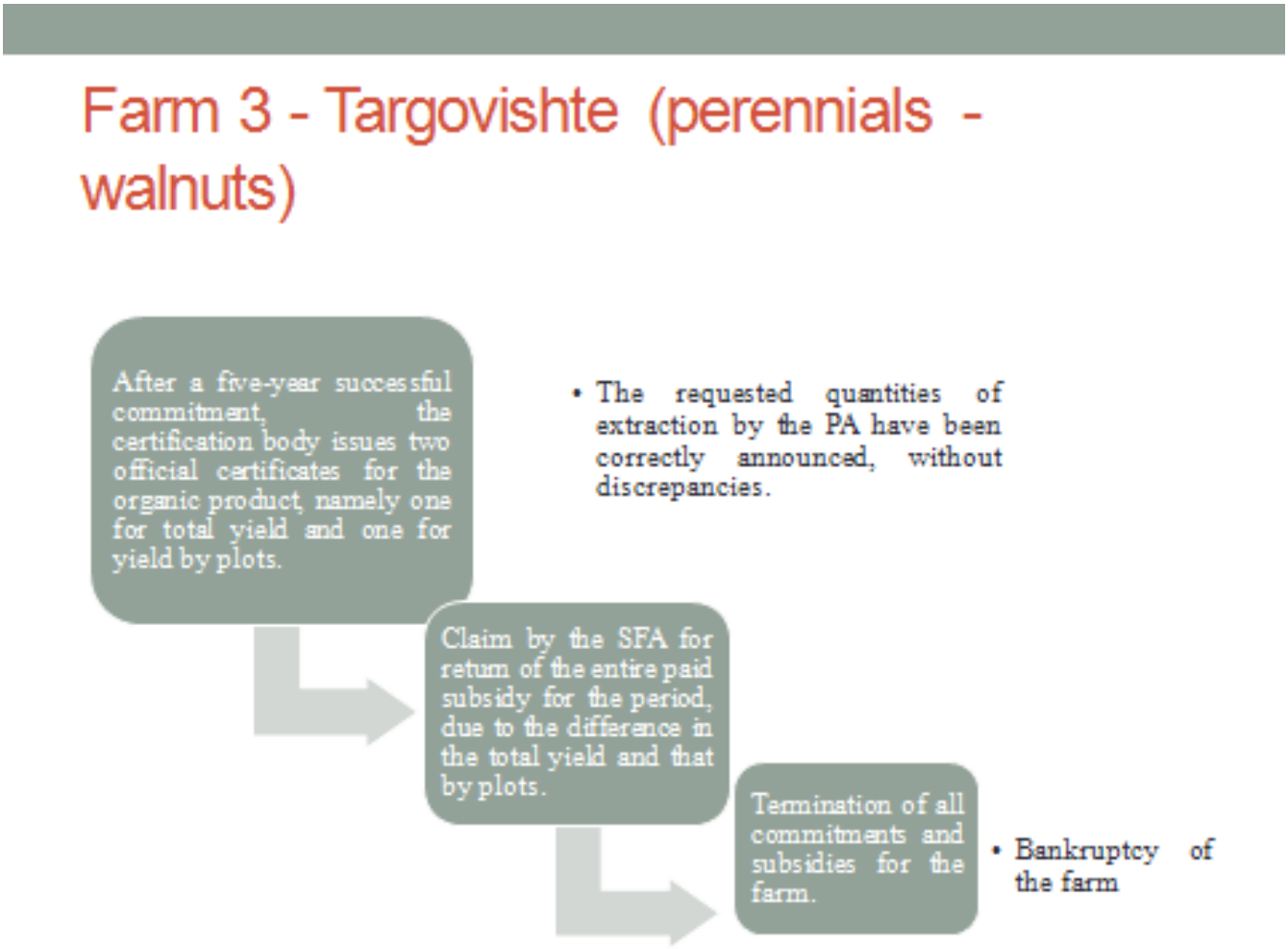
Source: Own scheme

Scheme 2: Case 2



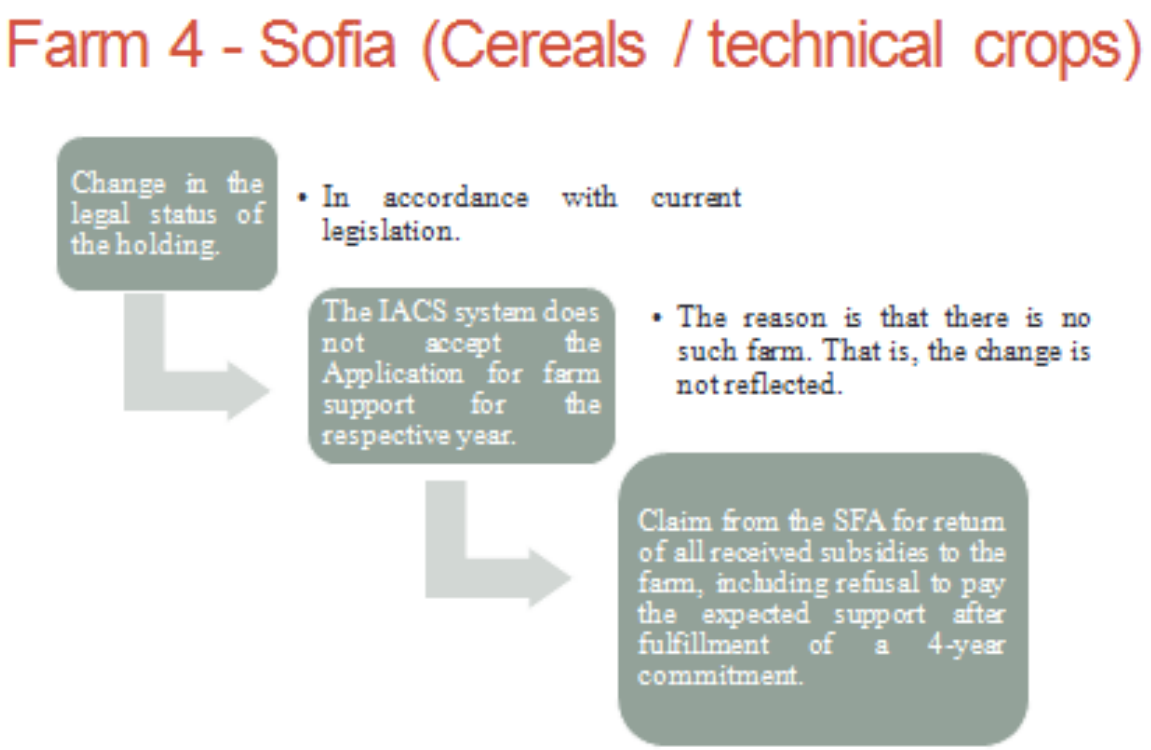
Source: Own scheme

Scheme 3: Case 3



Source: Own scheme

Scheme 4: Case 4



Source: Own scheme

CONCLUSIONS

To explain the action of the participants, emphasis is placed on the interaction between the individual and institutional context through which specific decisions are formed, but also on the broader context built by the cultural and social symbols of the environment in which the operation operates. Thus, the motivational decisions for support and development of the biological sector are considered through a combination of individual, cultural and structural characteristics.

The coherence between the norms and the context are conditions for the successful perception of the new ideas and their stabilization in institutions. For the successful and full institutionalization of the organic farming sector it is necessary, on the one hand, to maintain a consistent organizational environment, including predictable political and market mechanisms, but also to be content and adopt the principles of organic farming among the various affected countries - operators, consumers, civil servants and decision-makers, entrepreneurs, activists and others.

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INSTITUTE OF AGRICULTURAL ECONOMICS (IAE)

HISTORICAL BACKGROUND

Institute of Agricultural Economics (IAE) is created in 1935 as Institute for Agricultural and Economic Researches at the Ministry of National Economy, led by professor Yanaki Mollov. The main purpose was to analyze and support the agriculture from economic and social aspect in order to improve life conditions in Bulgarian village.

During the first period (1935-1944) since the creation of IAE, scientific research directions are related to: identification of guidelines for agricultural production development and farms profitability; agricultural and economic regions definition; farms organization and restructuring; prices and markets of agricultural goods. Analyses have been made of the life conditions in Bulgarian village and on this base the Government elaborates plan for improvement of the rural population's living standard.

During the second period (1944-1989), after the imposition of the model of central planning economy, occur radical changes of methodology, principles and methods of economic researches. The Institute was subject to fast growing. The areas of scientific researches expanded. Large-scale analyzes have been made in the following areas: zoning, specialization and concentration of agricultural production; planning and forecasting; organization, standardization and labour payment in agriculture; production organization, labour resources, agricultural 47

organizations' management; agricultural ergonomics; cost price, prices and realization of production; funding and crediting of agricultural organizations, economic and mathematic modeling etc. In this period the Institute has been renamed in Institute of Agricultural Economics and Organization.

During the third period (1989- 2007) IAE activities are oriented to problems of the transition from central planning of agriculture to market economy. In this transition period the Institute insures basic expert potential for assessments for the privatization of state assets in the country. Researchers are directed to active support for the State in the leading of agricultural reform; clarification of agricultural relations' problems, land market and land use; institutional, organization and production restructuring of agriculture and food industry, prices, markets, marketing and competitiveness; sustainable development and ecology; economic and sociologic problems of the village and rural areas.

Two new structures have been born from the Institute's composition. The first one – Agro-Market Information System (AMIS), created and funded by PHARE Program, disseminates weekly information about the dynamic of agricultural products' prices, for different areas. In 1995 has been created Agro-business and Accountancy Center, which trains and supports agricultural producers, giving advices, useful information and scientific – applied literature, up to 2000. Since 2001 the Institute is named Institute of Agricultural Economics (IAE).

During the fourth period, after the EU accession of the country in 2007, the scientific program of IAE is related to problems of CAP implementation and its impact on Bulgarian agriculture. The Institute elaborates statements, analyses and recommendations for the forms of state support for agriculture and rural areas, trade regimes and competitiveness, food safety, priorities of rural areas development; assessment of sustainability in the sector; agricultural science reforming and integration of Bulgarian economic science in European research nets.

NOTES: