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OPPORTUNITIES AND CHALLENGES TO SUSTAINABLE AGRICULTURE IN BULGARIA

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ABSTRACT
The concept of sustainable agriculture is widely used to develop international and national policies for the sector. The European Green Deal, which promotes stable food supply, guarantees revenues for farmers and green living environment. Overcoming rural deprivation is usually the central topic of its implementation. The path to sustainable agriculture requires a holistic approach, considering the complexity of social, economic, cultural, technical, and environmental aspects. In this paper we explore the main preconditions to sustainable development of the agricultural sector in Bulgaria based on select indicators, structured in three main groups: economic, social and environmental. We prioritize certain critical challenges, matching them with appropriate interventions with a great potential for impact.

Key words: agriculture sustainability, green deal, soil strategy, digitalization, labor productivity, R&D

INTRODUCTION

One of the challenges which Bulgaria faces as an EU member state after the Covid crisis is achieving sustainable growth through investing in digitalization, stimulating employment and supporting policies directed to environmental protection. Respectively, this has become a main focus for the development of national economic sectors, and agriculture, in particular. The attempt to reach such growth is accompanied by the realization of the strategic goal set in the Recovery and Resilience Plan, which intends to cover the main criteria for convergence of the Bulgarian economy and equalization of the income levels with the EU average. (8). The plan foresees specific measures for reforms/ investment, which for the agricultural sector include updating the strategic frame, digitalization of the farm-to-fork processes and stimulation of its technical and technological environmental level.

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The present report aims to outline the main indicators for evaluating the sustainability level in agriculture and then to compare the level of Bulgarian agriculture to the EU average. For the lagging areas we intend to propose specific possibilities for reaching economic, social and ecological sustainability.

INDICATORS FOR SUSTAINABLE GROWTH IN AGRICULTURE

In order to specify sustainability indicators in agriculture, we need to clarify the meaning of *agricultural sustainability*. Economic research is abundant with publications on "sustainability" and "sustainable growth", and they are understood with respect to the dynamics of the development of economic processes on a global scale. In this sense, there are many discussions regarding "sustainable agriculture" which fail to produce a uniform definition, but rather sketch its interpretation and building components. (1, 2, 5).

On the one hand, agriculture must be seen as a main industrial sector which plays a key role in tackling the food security crisis of the population. Food security is directly dependent on climate conditions and contemporary

technologies for growing crops and livestock. Therefore, it is affected by problems, such as global warming, population growth and food provision, the reduction of water resources and the deterioration of soil quality. On the other hand, the use of tools that curb the spread of diseases affecting agricultural crops and animals, such as pesticides, antibiotics, etc., exercises a negative effect on the balance in nature and often compromises the quality of agricultural production. We should not undermine the fact that young people see this sector as unattractive and undesirable, and only a few of them decide to orient their career choice in that direction.

The historical review of the concept of *agricultural sustainability* underscores several essential viewpoints (4), namely:

- Understanding *agricultural sustainability* as an ideology, directed to satisfying the needs of food production in a way which allows future generations to benefit from natural resources with the same quality (6);
- Understanding *agricultural sustainability* as a strategy directed to reaching long-term goals, related to increasing its efficiency (3).

The abovementioned statements permit us to adopt the following definition for *agricultural sustainability* that belongs to Van Loon (van Loon et al., 2005; FAO, 2013), and is cited by Talukder (12): "***agricultural sustainability*** *is a human activity [related to the production of] food and fiber in a manner that ensures the well-being of present and future communities without diminishing the surrounding ecosystems' capacity and ensuring environmental integrity, social well-being, resilient local economies and effective governance."*

The assessment of sustainability of the agricultural sector may be performed through several aspects (components) – environmental, economic and social (7, 9-11). From the point of view of spatial range, it can be seen at three levels: local, regional and national (14). Therefore, the indicators used for evaluation may also differ. Below we have attempted to make a brief assessment of the sustainability level of the agricultural sector in the Republic of Bulgaria on the basis of select indicators **(Table 1).** The used indicators are arranged according to the abovementioned three aspects, with respect to the methodology of EU sustainability assessment, based on Eurostat data (13, 15).

Table 1. *Indicators for sustainable growth in agriculture*

Components	Indicator	Explanatory Text
Social	• People at risk of poverty and social exclusion; • Index of the labour exercised in agriculture	• The total sum of people who are at risk of poverty after social transfers, experiencing severe material deprivations or living in households with a very low work intensity • Thousands of annual work units (AWU)
Economical	• Gross added value in the Environmental goods and services sector (EGSS) • Real GDP per capita	• Determined as a difference between the value of the sectoral production and the interim consumption of environmental goods and services; • Ratio of the real GDP to the average number of people for the specific year
Environmental	• Area under organic farming;	• The indicator measures the share of total utilised agricultural area (UAA) occupied by organic farming (existing organically-farmed areas and areas in process of conversion). (Eurostat)
	• Final energy consumption by agriculture/forestry per hectare of utilised agricultural area	• This indicator expresses the sum of the energy supplied to agriculture for all energy uses. (Eurostat)
	• Ammonia emissions from agriculture - % of total emissions	• This indicator tracks trends in anthropogenic atmospheric emissions of ammonia by agriculture. (Eurostat)

Source: Own contribution

The two social indicators presented in this study are far from exhausting the topic of the social component for the sustainable sector, however, they outline the positive or negative trends for Bulgarian agriculture. The reported equivalised disposable income is below the poverty risk threshold, which is set at 60 % of the national average equivalised disposable income **(Figure 1).** Agricultural labour in the EU has decreased by 24,9% since 2000, which with respect to AWU, represents a drop of 3,7 million (from 14,9 million AWU in 2000 г. to 11,2 million AWU in EU-27 in 2009).

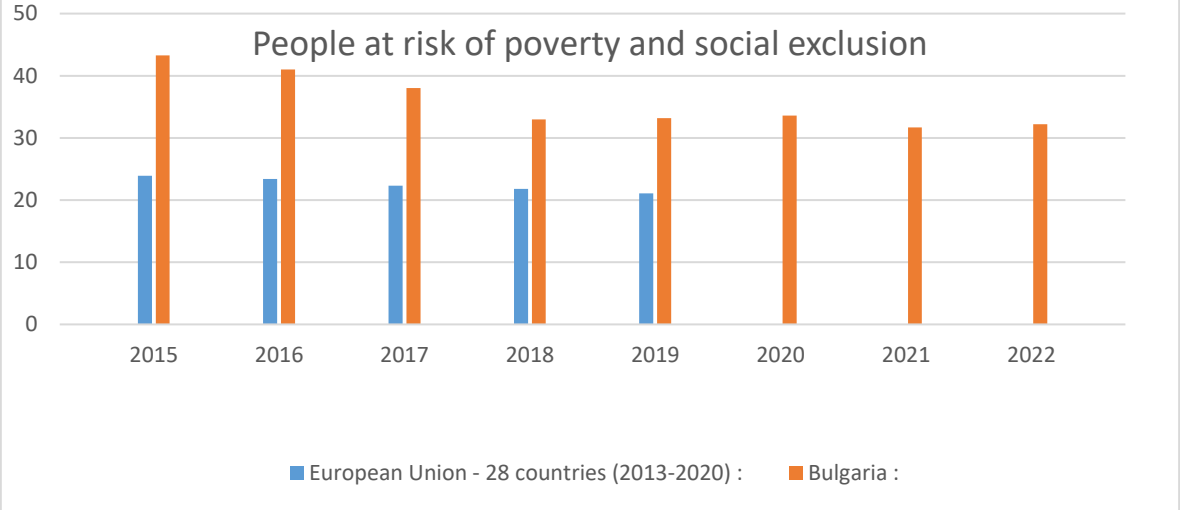

Figure 1. Population at risk of poverty and social exclusion in the EU and Bulgaria

A probable reason for this reduction at a national level may be the relatively high share of the part-time laborers employed in agriculture **(Figure 2).** This is proven by the reported number of actual agricultural laborers that is higher than the annual work units.

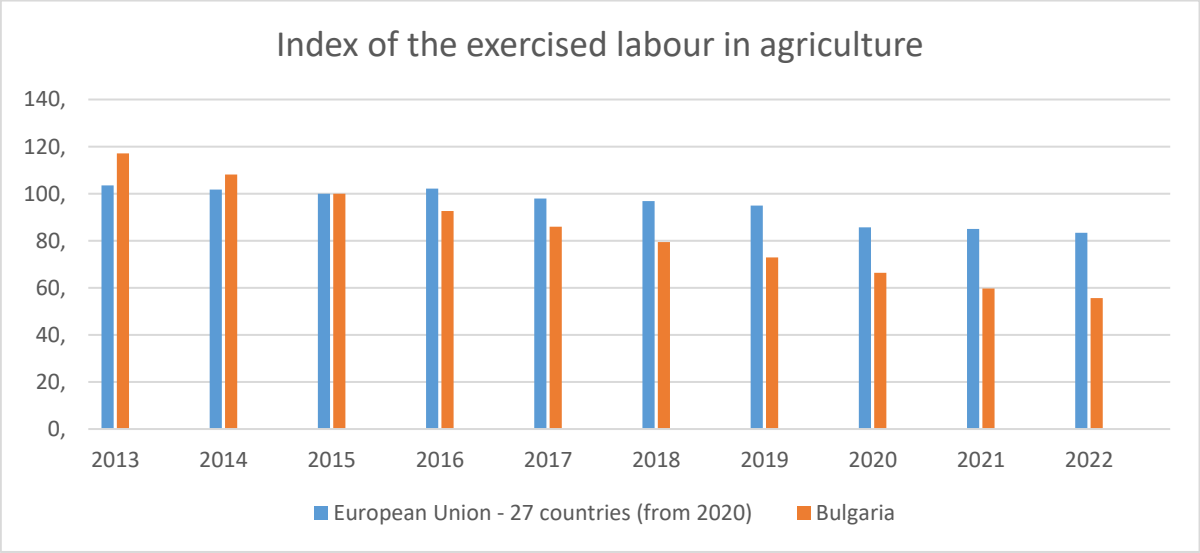

Figure 2. Index of the exercised labour in agriculture in the EU and Bulgaria (2013 – 2022)

The Environmental goods and services sector (EGSS) is determined as that part of the economy of a given country which produces goods and services used in the activities of environmental protection. The values of these indicators at a national level significantly lag behind the EU average **(Figure 3).** Due to the complex methodology in forming this index and its relationship to the variety of business identification numbers, and the presence of production cycles, whereby some of the goods or services are not environmentally sound, we refrain from additional comments.

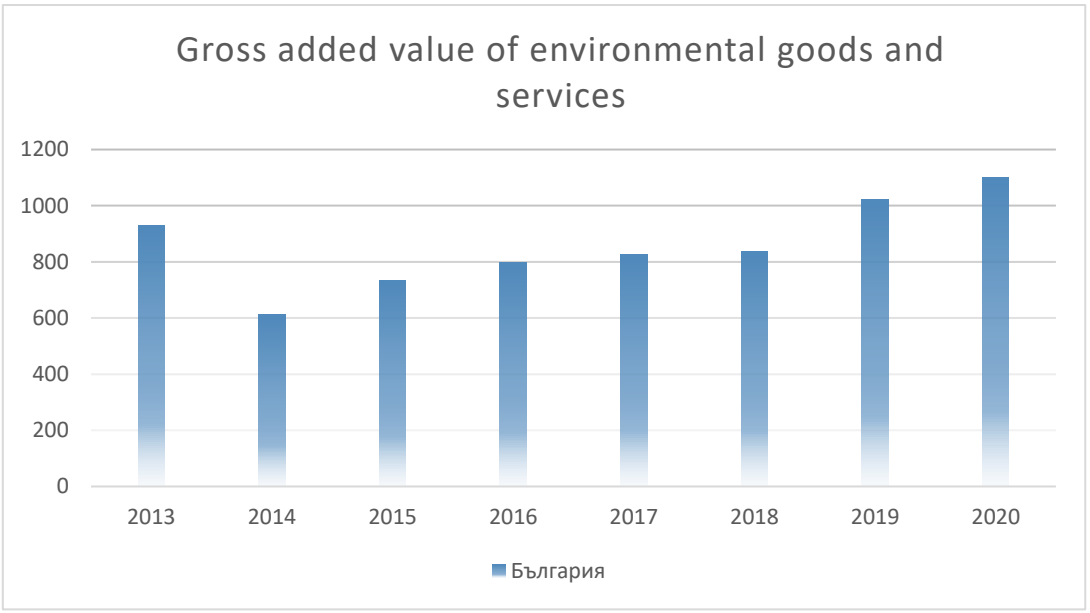

Figure 3. Gross added value in environmental goods and services in Bulgaria (2013 – 2020)

As a measure of economic activity in this study, we have used the real GDP per capita **(Figure 4).** The durable lagging here (more than 5 times), however, varies considerably in the separate regions of the country which shows large disproportions in the economic activity at a regional level.

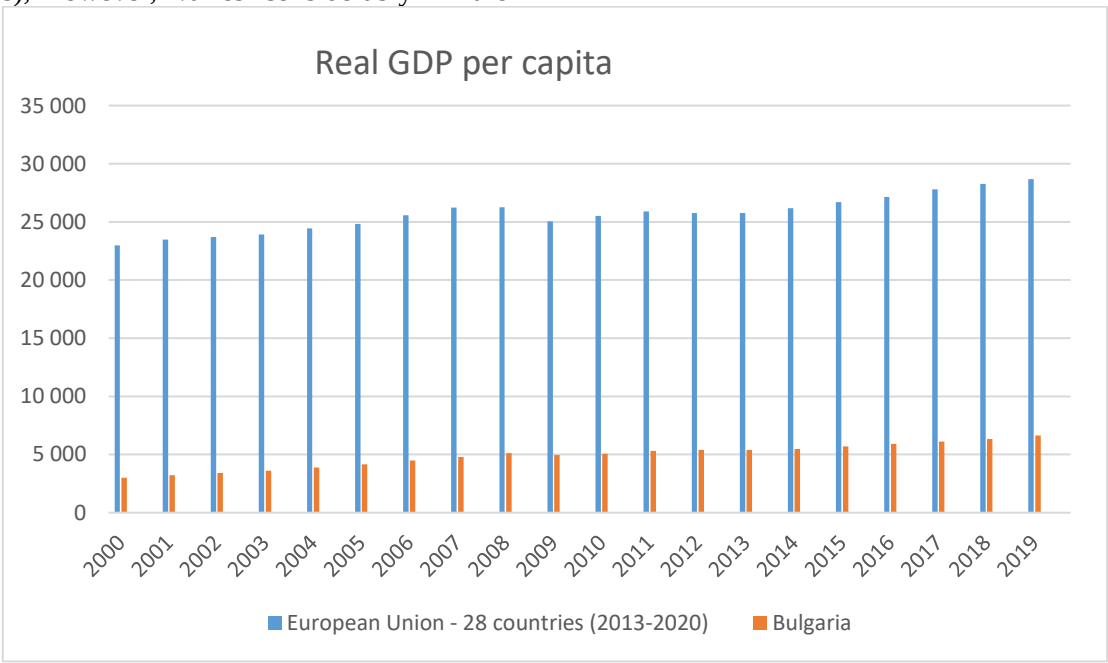

Figure 4. Real GDP per capita in the EU and Bulgaria (2000 – 2019)

The induction analysis of the environmental sustainability indicators in the sector manifests a huge variety of categories viewed in international research depending on the set aims of individual studies. The current selection has been justified by the strength and the direction of lagging or growth of the indicators where the efforts at a national level would be biggest. For instance, a significant lagging has been noted for the indicator: final energy consumption from agriculture/ forestry per hectare of used agricultural area. The use of oil products and direct electricity in the sector remains a priority **(Figure 5).**

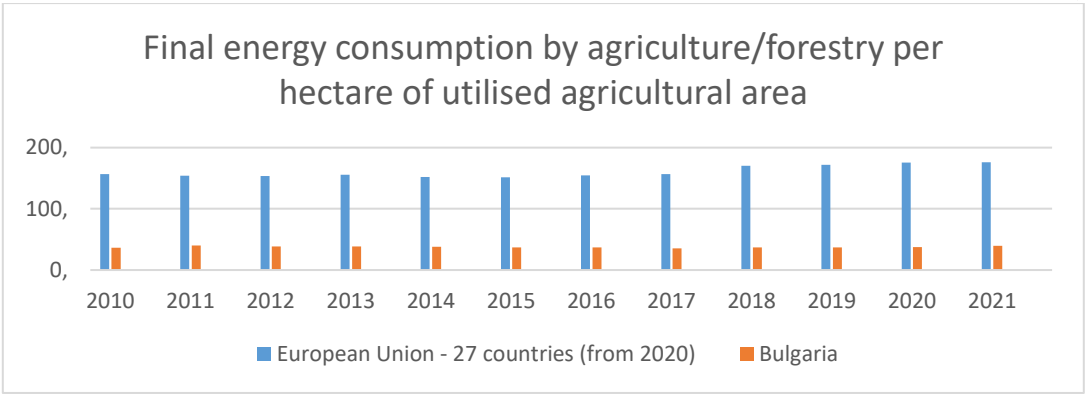

Figure 5. Consumption of energy, used for crop growing per hectare of arable land in the EU and Bulgaria

Here, we have avoided the use of comparisons, due to the considerable differences in the size of arable land per EU member state. The areas under organic farming are relatively small **(Figure 6).** Simultaneously, there is a gradual increase in the share of ammonia emissions in the total percentage of emission resulting from crop farming, which represents a negative trend. **(Figure 7).**

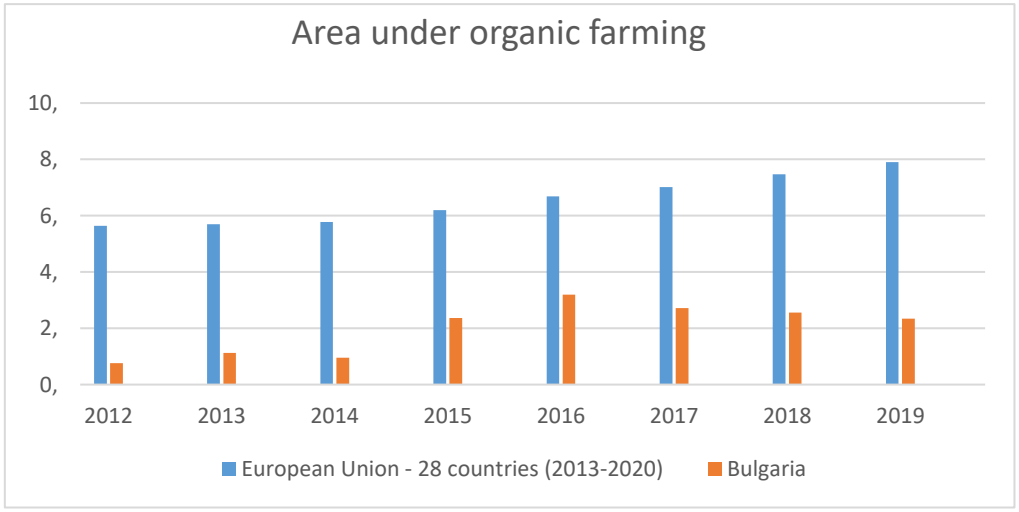

Figure 6. Land used for organic crop farming in the EU and Bulgaria

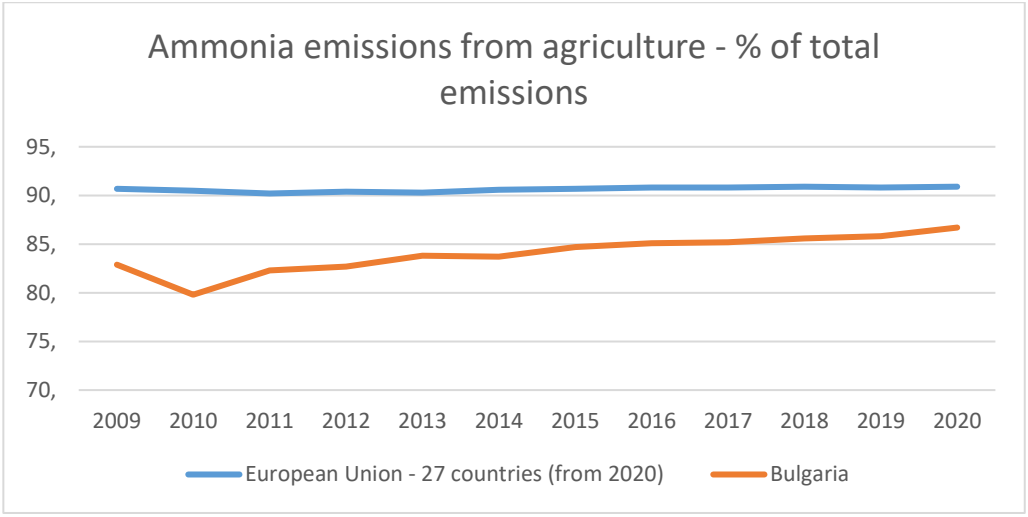

Figure 7. Ammonia emissions – a percentage of the total emissions resulting from crop farming in the EU and Bulgaria

In all select indicators of the three directions – social, economic and environmental we observe lagging or below the EU average values. Bulgarian agriculture faces significant challenges in responding to the set EU sustainability standards.

CONCLUSION

Agriculture plays a key role in the European Green Deal with various policies and strategies for encouraging sustainability in the sector. Despite the clear goals and policies, it will take a long way to realize an efficient transition to sustainability, based on implementing integrated good practices and scientifically justified solutions in order to aid the transition to sustainable agriculture with respect to environmental, social and economic perspectives. The holistic approach is imperative in view of the multidisciplinary character of the issues reviewed here.

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