sciendo

Ecological agriculture and its role in sustainable development

Simona Roxana PATARLAGEANU
Bucharest University of Economic Studies, Romania
rpatarlageanu@eam.ase.ro.

Mihai DINU
Bucharest University of Economic Studies, Romania
mihai.dinu@eam.ase.ro

Amelia DIACONU
Artifex University, Bucharest, Romania
diaconu.amelia@gmail.com

Mihaela Diana OANCEA NEGESCU*
Bucharest University of Economic Studies, Romania,
**Corresponding author, mnegescu@yahoo.com*

Abstract. *The role of the organic farming system is to produce cleaner food, more suitable for human metabolism, in full correlation with the conservation and development of the environment. One of the main purposes of organic farming is to produce fresh and authentic agri-food products that respect natural and environmental factors. We can also talk about another alternative in which not only human consciousness develops but also the resilience of all levels of the biosphere. This will create favorable conditions for mankind for its day-to-day work to be fully successful, creating a continuing utility for society, both nationally and globally, as a result of which important social forces are freed from unproductive and controlling activities, and can be used directly in production activities. The present specialized paper was born through the analysis of the organic- natural household system, without chemicals, being in accordance with the second development alternative, presented above. The starting point of the paper is the notion of bio-agriculture. It will be investigated first of all, the right of existence of this way of conception, the special way of life and the methods of organic agriculture in the European space, as well as in the light of the development processes.*

Keywords: agriculture, ecology, development rural environment, strategies

Introduction

The man of the 21st century faces great challenges, both in terms of energy resources and in creating harmonious coexistence with the environment (Mogos et al., 2021). Explicit neglect of long-term unviable solutions would seem to be a one-sided approach (Cappelli et al., 2021).

Organic farming means the form of household based on natural biological cycle, organic fertilizer, biological plant protection, without synthetic plant protection solutions (Dvorak, 2021).

Sustainable agriculture is a profitable economic system, which contributes to maintaining, improving the natural source of households, influencing positive agricultural activities, which is able- not only in this sector (in agriculture) - to achieve acceptable earnings of people who work in this sector, but can provide quality and achievable food in the long run (Fuhlendorf et al., 2018; Constantin et al., 2021).

DOI: 10.2478/picbe-2022-0038
© 2022 S. R. Patarlageanu; M. Dinu; A. Diaconu; M. D. Oancea Negescu, published by Sciendo.
This work is licensed under the Creative Commons Attribution 4.0 License.

Organic farming is currently in the process of being institutionalized. From a marginal phenomenon, it has become an ever-growing activity and an ecological figure supported by the European Union (Lobley & Reed, 2009).

The main characteristics of the Romanian ecological market is that it is quite young, most of the operators (producers, processors, traders) being in the first stages of development. The market is mainly based on imports of final products and exports of raw materials (Sarbu et al., 2021) (Andrei et al., 2021). In the meantime, consumers are becoming increasingly aware of the existence of eco-labels and certified products and their benefits (Verain, 2015).

Given the importance of the agricultural sector for the national economy but also the world economy and more, the trends observed in organic farming, the author considers extremely relevant the issue of business models and business performance in this field (Karp & Wood, 2014). That is why the question arises whether Romanian producers and processors are performing in their market segment and earn enough to develop and expand their business (Balu et al., 2021). From a consumer perspective, it is clear that organic products have gained popularity (Burlacu et al., 2021). In this context, there are many questions about the business models of green operators that need to be answered (Radulescu et al., 2020).

Literature review

Organic farming, as well as sustainable development are terms of resonant importance and which have taken shape more and more over the years (Radulescu et al., 2020). Important studies have synthesized these problems, also aiming at the connections that are established on the economic level, but with a visible impact on the environmental component and of course the social one (Profiroiu et al., 2020).

In this sense, Stan (2005) brings to the fore the issue of environmental protection through sustainable agriculture. According to his work, organic farming is the system that promotes soil cultivation by means that maintain a balance between agroecosystems and the environment, conducive to the conservation of all elements and positive processes that make up contemporary and future agricultural systems (Stan, 2005).

Vereş (2011) debates the issue of Romanian agriculture, bringing to the fore the opportunities for sustainable development of the agricultural field based on favorable natural values and by attracting funds meant to add value on this ecological side, but also to the real challenges that Romania may face and must be overcome to ensure a medium- and long-term economic goal.

Lobley & Reed (2009) contribute to the definition of organic farming in rural development based on an exploration of the socio-economic links of organic and non-organic farms in the United Kingdom and the European Union.

Padel & Schmid (2009) make the connections between the environment and economic values through the study related to the implementation of ecological principles and values in the European Regulation for organic food. Organic farming is based on soil health and agro-ecological management, prohibiting the use of chemical pesticides and fertilizers, which have adverse effects on human health but also on ecosystems (Bran et al., 2020). Ecological practices bring benefits, but they also involve risks. The literature presents several types of risks that an ecological business can have (Negescu Oancea, et al., 2020).

Breitmeier & Tanzer (2020) add value to the concept of sustainable development through the study of politicized sustainability and agricultural policy by comparing the understanding of norms in international organizations.

Cappelli et al (2021) often discusses the importance of biodiversity science principles for the use and guidance of soil microbial communities for sustainable agriculture.

Last but not least, Magyar (2001) writes in her study that the expansion of the bio-household has not only economic causes, environmental protection, but also ideology, philosophy-social. Organic farming must be considered not only as an economic activity, but also as a social phenomenon (Dima et al., 2020), because many basic elements of organic cultivation could not be demonstrated by experiments (Profiroiu et al., 2020).

Methodology

The material and methods used for the purpose of this paper, consists of research, forays into the literature; evaluation through the research and design triangle, analysis and interpretation of data from the literature, as well as statistical calculations. Documentation remains a key element in reporting on the issues raised by organic farming and its implications for the conservation of natural resources and ecosystems for future generations.

The research methods used in the paper are the following: documentation, especially theoretical documentation through the analysis of the literature, in this sense being studied numerous books, studies, national and international articles; statistical methods, such as classification, synthesis, graphical representation of investigated events and phenomena; comparative analysis, used in the comparison of indicators specific to organic and conventional farms. The empirical study presented in this article is a deductive research that is based, first of all, on treating the existing theory and following the way in which the theoretical aspects can be put into practice in the agricultural environment of the European Union and more particularly in Romania.

Results and discussion

The benefits of organic farming

This section aims to review scientific research on the effects of organic farming on the environment compared to conventional agriculture.

Simply put, organic farming is an agricultural system that produces crops while respecting nature (Reganold & Wachter, 2016; Pătărlăgeanu et al., 2021). Organic farming is based on a set of principles and practices designed to minimize anthropogenic impact on the environment, while ensuring that the farming system operates as naturally as possible (Padel & Schmid, 2009). An agricultural system based on this definition claims to be more environmentally friendly and therefore has fewer adverse effects than conventional agriculture (Willer & Lernoud, 2016).

According to the environmental standard, typical organic farming practices in the EUinclude crop rotation, very strict limits on chemical pesticides and the use of synthetic fertilizers, animal antibiotics, food additives and technological aids and other production factors, recommends the use of local resources (plant and animal species, which are resistant to disease and adapted to local conditions), raising animals in open-air systems with freedom of movement and foraging with organic feed, the use of animal husbandry practices appropriate to different species of animals.

Under EU law food can be marked as organic if at least 95% of its ingredients are organic. Furthermore, the use of genetically modified organisms (GMOs) and products made from GMOs is still banned in organic production in the EU and products containing GMOs cannot be labeled as organic.

Also, in this section we will investigate the risks specific to agriculture and trade in organic products. Farm-level risks and events can be viewed at the aggregate market level, and small changes in aggregate supply and demand for agricultural products can lead to rapid or substantial price changes which in turn affect farm profits (Breitmeier et al., 2020; Petrescu et al., 2022). This section contains a case study on trade risk mitigation of the trade in green raw materials trade for an international green raw materials intermediation platform operating online.

The marketing of organic products obviously involves a risk such as credit risk or quality risk (Dos Santos et al., 2018). In the particular case of organic products, there is a degree of distrust in the market due to the various cases in which products labeled and marketed at organic prices have not been compliant in terms of organic quality.

Organic farming, as a way of farming in the world, has emerged differently in space and time, different people- with similar conceptions- have initiated different forms of organic farming (Danciu, 2006). Thus the trends of organic farming have received different names in some currents. This chapter relates the characteristics of three more well-known currents (biodynamic, biological-organic and permaculture), respectively it will list other concepts.

Regular use of biodynamic preparations on every surface of the economy is the basic condition of classification (Bodislav et al., 2020a). Biodynamic preparations are used to maintain the life of the soil and to mention the light over the plants, respectively for the inoculation of compost or manure (Mishra et al., 2020).

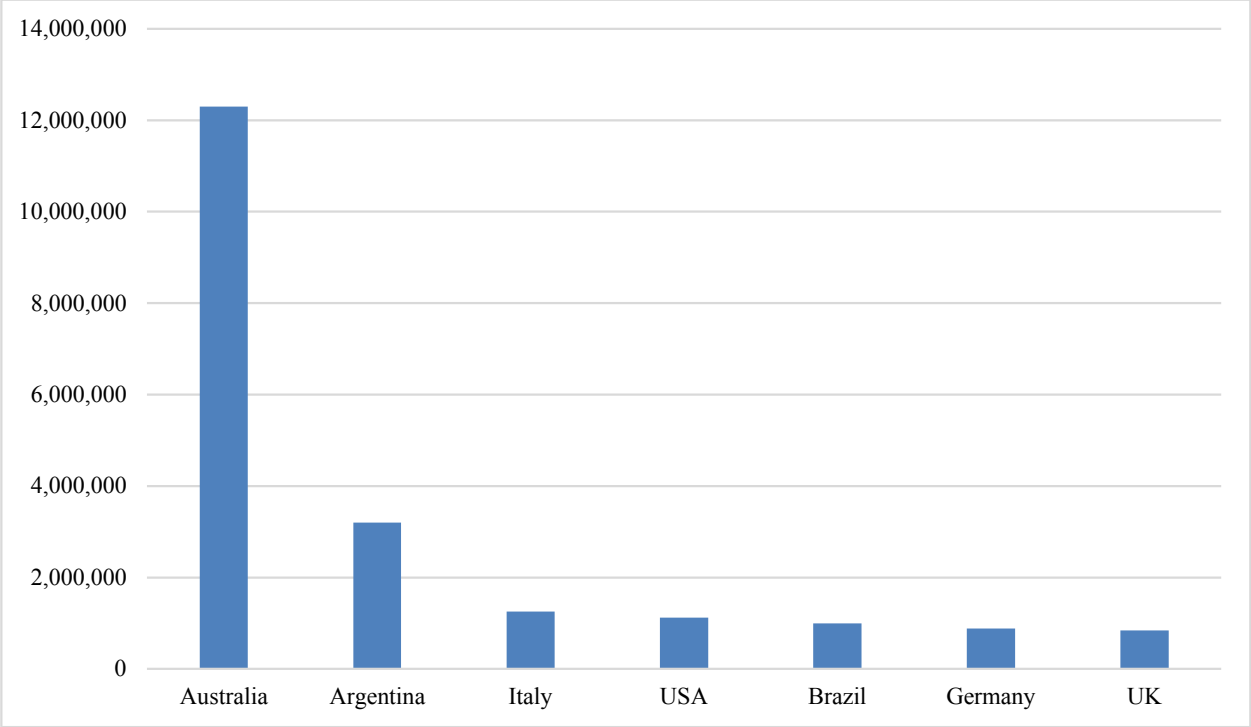


Figure 1. States with maximum efficiency in terms of organically cultivated land (ha / country)
Source: Crowder & Reganold, 2015.

The ecological market in Romania

This part is dedicated to the analysis of the structure of the Romanian ecological market and begins with a brief presentation of the theoretical approach of market research and then presents in detail the analysis of the data collected. The chapter covers the evolution of the number of organic

operators between 2017 and 2020, the types of ecologically certified legal entities, as well as the geographical distribution of operators.

Good market information is necessary to make good business decisions (Bodislav et al., 2020b). Marketing research is a process that aims to provide the kind of information needed for an optimal decision (Orzan et al., 2020). A manager may need to know what types of new products / services can bring a certain expected rate of return.

Moreover, marketing research could improve current products or services to make them more in line with customer needs and expectations (Popescu, 2013).

In the context of this chapter, the meaning of the term organic market refers strictly to products labeled as organic in accordance with the provisions of EU law transposed into national law. The Romanian ecologically certified operators represent the national offer on the analyzed market and the imports of certified products will be ignored for this moment.

In countries such as Denmark, the share of the organic market in the total retail market reaches 7.5%, in Austria 6.5%, and in France 4% (Crowder & Reganold, 2015). Assuming that Romania will follow the same path as the other EU countries and taking into account the agricultural potential of the country, it can be concluded at this time that there is a significant potential for growth in the Romanian organic market.

Evolution of the number of ecological operators

This section presents the available information on the evolution of the number of green operators during the analyzed period. It can be noticed that, after a relatively constant level between 2017 and 2018, starting with 2019 there is a significant change in trend. Moreover, in 2019, compared to 2017, there is a significant increase in the number of environmental operators. This situation is explained by the fact that many of the newly certified operators have certified very small areas of land. This explanation is also supported by research focused on the impact of group certification. There are very few processors of organic products in Romania (less than 1% of the total number of certified organic operators), and this is the basis of the current market dynamics: organic raw materials are exported and finished organic products are imported.

The evolution of the number and type of legal organization of ecological operators in Romania in the period 2017-2020 is presented in the following table.

Table 1. Ecological operators by type of legal entity between 2017-2020

Number of operators	2017	2018	2019	2020
Associations	42	46	51	56
Family businesses	59	61	66	72
Individual enterprises	610	650	690	710
Firms	990	1080	1120	1180
PFA	3125	3225	3440	3510
Individuals	9372	9550	9780	10025
Other types of organization	10	12	15	20

Source: own calculations based on the data collected.

Analyzing the dynamics of individuals, it is possible that in the period from 2017 to 2020 there are over 15,000 distinct operators. The number of individuals who are constantly certified

ecologically in the three consecutive years is 7680, representing 60% of individuals in 2018 and 72% of the same type of operators in 2020.

The table shows the largest areas to be subsidized in terms of annual rates for different groups of plants as well as for some crops.

Table 2. Payment rates and size of areas that can be supported

	Culture	Size to be paid	Size area
C1	Vegetables	350 EURO/ha/year – transition 290 EURO/ha/year – classified	0.2-1 ha
C2	Fruits	370 EURO/ha/an - transition 190 EURO/ha/an – classified	2-10 ha
C3	Aromatic and medicinal plants	310 EURO/ha/year - transition 220 EURO/ha/year– classified	0.1-3 ha
C4	Forage plants	123 EURO/ha/year- transition- 92 EURO/ha/year- classified	0.5-12 ha
C5	Natural pastures	45 EURO/ha/year – transition 38 EURO/ha/year – classified	4-0 ha

Source: Agency for Financing Rural Investments, 2020.

The following figures will study the evolution of areas in organic farming and the evolution of livestock in organic farming.

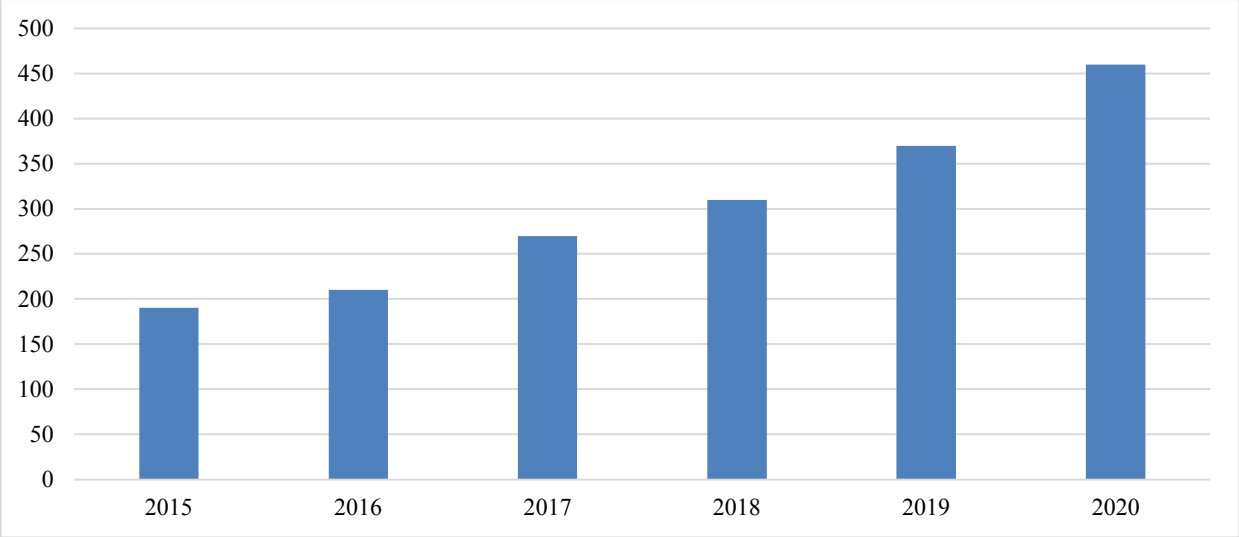


Figure 2. Evolution of areas in organic farming (ha)

Source: Ministry of Agriculture and Rural Development, 2020.

Taking these into account, one can came to the conclusion that the policy of supporting the Romanian state oriented towards organic farming is the foundation of the market and not the protection, maintaining the environment is the main goal, because it supports through payments the circumstances, which bring higher yield that is profit-oriented.

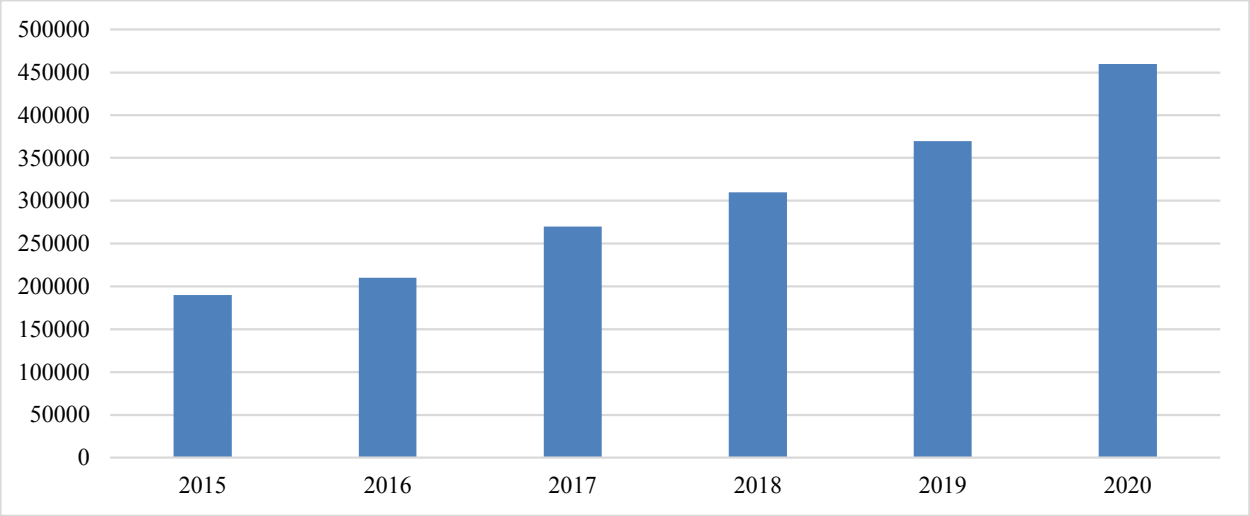


Figure 3. Evolution of productions in organic agriculture (ha)
Source: Ministry of Agriculture and Rural Development, 2020.

On the other hand, this policy does not take into account the balance of rural areas or maintaining the population in regions with lower potential, diversifying the chances of earning a living, because the transition to organic farming could have such an effect.

Conclusion

By discussing the problems of organic farming, as well as the notions of sustainable agriculture, the analysis of fundamental principles, then through the prism of the European agrarian model, by the characteristics of organic and intensive agriculture balancing their advantages and disadvantages, the following conclusions were reached.

First, organic farming was analyzed in the context of sustainable agriculture and it was concluded that the characteristics of organic farming discussed and then cited correspond to the principles of sustainability. First of all, because the system of organic farming is attentive to the maintenance and protection of living communities, starting from soil microorganisms, by supporting different crops that live in symbiosis and by free breeding of animals according to their way of life, to consumers final products of organic products ensuring a healthy environment and final product. On the other hand, the concept of organic farming is based on a system that does not require a huge amount of energy input, it is characteristic of the reuse of waste and residues, the soil, as a natural resource is constantly renewed.

Regarding the quality of life, it gives people the opportunity to choose what they want to consume, it appears as a serious alternative to the food products produced by multinational companies in a very restricted competitive environment. At the same time, it offers a new human-environment relationship. It creates the model of quality of life, and in terms of a cleaner environment and food a sustainable form of production and consumption.

The organic farming system serves as a solution - its role is also pronounced in the multi-functional agrarian model- in those efforts, that agriculture must be practiced in a way that is in harmony with the laws of nature.

The energy crisis also mentioned at the world conferences on sustainable development (Rio de Janeiro, Johannesburg), the continuous depletion of energy sources does not pose a danger to

organic farming. Because it does not depend on their use, even in the case of smaller organic households, the processes of organic farming and animal or human labor can be carried out.

Organic farming, as the cutting-edge technology of agriculture, can be effective if it uses all the results that come from human knowledge, but it must take steps to better understand the principles of nature's functioning, and in collaboration with it can produce the amount of the necessary healthy food, without endangering the environmental situation, thus becoming sustainable and long-term.

References:

Andrei, J.V., Chivu, L., Constantin, M., Subić, J. (2021). Economic Aspects of International Agricultural Trade and Possible Threats to Food Security in the EU-27: A Systematic Statistical Approach. In: Erokhin V., Tianming G., Andrei J.V. (eds) Shifting Patterns of Agricultural Trade. Springer, Singapore. https://doi.org/10.1007/978-981-16-3260-0_10.

Balu, F. O., Radulescu, C. V., Bodislav, D. A., Gole, I., Buzoianu, O. C. A., Burlacu, S., & Balu, P. E. (2021). Cost modeling and computation in the healthcare industry. Case study on a swiss medical care organization. *Economic Computation & Economic Cybernetics Studies & Research*, *55*(1). DOI: 10.24818/18423264/55.1.21.05

Bodislav, D. A., Buzoianu, O. A. C., Burlacu, S., & Rădulescu, C. V. (2020a). Analysis of companies in Romania from the perspective of risk perception and the management needs thereof. *Economic Convergence in European Union*, 341.

Bodislav, D.A., Radulescu, C.V., Bran, F. and Burlacu, S. (2020b). Public Policy in the Areas of Environment and Energy. 6th BASIQ International Conference on New Trends in Sustainable Business and Consumption. Messina, Italy, 4-6 June 2020. Bucharest: ASE, pp. 228-235

Bran, F., Rădulescu, C. V., Bodislav, D. A., & Burlacu, S. (2020). Environmental risks in the context of globalization. *Economic Convergence in European Union*, 350.

Breitmeier, H., et al. (2020). Aligned Sustainability Understandings? Global Inter-Institutional Arrangements and the Implementation of SDG 2, *Politics and Governance* (ISSN: 2183–2463) 2021, Volume 9, Issue 1, pp. 141–151.

Burlacu, S., Popescu, M. L., Diaconu, A., & Sârbu, A. (2021). Digital Public Administration for Sustainable Development. *European Journal of Sustainable Development* (2021), 10, 4, 33-40 ISSN: 2239-5938

Cappelli, S.L., et al. (2021). Utilizing Principles of Biodiversity Science to Guide Soil Microbial Communities for Sustainable Agriculture.

Constantin, M., Strat, G., Deaconu, M. E., & Pătărlăgeanu, S. R. (2021). Innovative Agri-Food Value Chain Management through a Unique Urban Ecosystem. *Management Research & Practice*, *13*(3). http://mrp.ase.ro/no133/f1.pdf.

Crowder, D.W. & Reganold, J.P. (2015). Financial competitiveness of organic agriculture on a global scale. *Proceedings of the National Academy of Sciences*, 112(24), pp.7611-7616.

Danciu, V. (2006). Marketing ecologic- etica verde a producţiei şi consumului", Ed. Economică, Bucureşti,

Dima, C., Burlacu, S., & Buzoianu, O. A. C. (2020). Strategic Options for the Development of Ecotourism in the Danube Delta in the Context of Globalization. *In SHS Web of Conferences (Vol. 74, p. 04005). EDP Sciences.* Doi: 10.14207/ejsd.2021.v10n4p33

Dos Santos, M.J., Diz, H. (2018). Towards sustainability in European agricultural firms. In International Conference on Applied Human Factors and Ergonomics (pp. 161–168).

Springer, Cham.
Dvořák, T. (2021). The ecological niche and conservation value of Central European grassland orthopterans: A quantitative approach. Mendeley Data V1. https://doi. org/10.17632/rxsgcnx547.1.
Fuhlendorf, S.D., et al. (2018). Perspectives on grassland conservation efforts: should we rewild to the past or conserve for the future? Philos. Trans. R. Soc., B 373, pp.1–10.

Karp, S., Wood, S. (2014). Functional traits in agriculture: agrobiodiversity and ecosystem services, în volumul *Trends in Ecology & Evolution*, Columbia University, New York, Vol. 30, No. 9.
Lobley, M., & Reed, M. (2009). The contribution of organic farming to rural development: An exploration of the socio-economic linkages of organic and non-organic farms in England.
Mishra, S., et al. (2020). Agriculturally important fungi for sustainable agriculture. A.N. Yadav (Ed.). Cham: Springer.
Mogos, R. I., Negescu–Oancea, M. D., Burlacu, S., & Troaca, V. A. (2021). Climate Change and Health Protection in European Union. *European Journal of Sustainable Development* (2021), 10, 3, 97-108 ISSN: 2239-5938 Doi: 10.14207/ejsd.2021.v10n3p97
Năstase, M., Roja, A., Burlacu, S., Coroban, L., Matis, C., Cristescu, I., & Cristache, N. (2020). Perspectives Regarding the Organizational Culture within the Romanian Textile Industry. *Industria Textila*, 71(1), 73-80.
Negescu, M. D.; Burlacu, S.; Mitriţă, M.; Buzoianu, O. C. A. (2020). Managerial Analysis of Factoring at the International Level *Challenges of the Contemporary Society*. Proceedings; Cluj-Napoca Vol. 13, Iss. 1, : 99-102. Cluj-Napoca: Babes Bolyai University
Orzan, M. C., Burlacu, S., Florescu, M. S., Orzan, O. A., & Macovei, O. I. (2020). The effects of online marketing on financial performance in the textile industry. *Industria Textila*, 71(3), 288-293.
Padel, S., et al. (2009). The implementation of organic principles and values in the European Regulation for organic food. *Food Policy*, 34(3), 245-251.
Pătărlăgeanu, S. R., Constantin, M., Strat, G., & Deaconu, M. E. (2021). *Best Practices of Circular Activities in the Agri-food Sector from the Netherlands and Romania*. ASE Publishing House. https://www.ceeol.com/search/book-detail?id=949510.
Petrescu, I.E., Ignat, R., Constantin M., Istudor, M. (2022). Risk Management of Agri-Food Value Chains – Exploring Research Trends from the Web of Science. In: Dima, A.M., Kelemen, M. (eds) Digitalization and Big Data for Resilience and Economic Intelligence. https://doi.org/10.1007/978-3-030-93286-2_4.
Popescu, M. (2013). Ocuparea în agricultura României şi creşterea productivităţii muncii, decalaje faţă de Uniunea Europeană, Economia agrară şi dezvoltarea rurală, vol. 6, nr.1, Institutul de economie agrară al Academiei Române.
Profiroiu, C. M., Bodislav, D. A., Burlacu, S., & Rădulescu, C. V. (2020). Challenges of Sustainable Urban Development in the Context of Population Growth. *European Journal of Sustainable Development*, 9(3), 51-51.
Profiroiu, M. C., Radulescu, C. V., Burlacu, S., & Guţu, C. (2020). Changes and trends in the development of the world economy. *In Competitivitatea şi inovarea în economia cunoaşterii* (pp. 324-330).
Rădulescu, C. V., Bran, F., Burlacu, S., Dobrea, C. R., & Diaconu, S. (2020, December). Challenges Regarding Food Resources in the Context of Globalization and Population

Growth. *In Proceedings of the International Conference on Economics and Social Sciences* (pp. 1041-1052). Sciendo.

Rădulescu, C. V., Burlacu, S., Bodislav, D. A., & Bran, F. (2020). Entrepreneurial Education in the Context of the Imperative Development of Sustainable Business. *European Journal of Sustainable Development*, 9(4), 93-93.

Reganold, J.P. &Wachter, J.M. (2016). Organic agriculture in the twenty-first century. *Nature Plants*, 2, p.152.

Sarbu, R., Alpopi, C., Burlacu, S., & Diaconu, S. (2021). Sustainable urban development in the context of globalization and the health crisis caused by the covid-19 pandemic. *Les Ulis: EDP Sciences*. doi:http://dx.doi.org/10.1051/shsconf/20219201043

Stan V. (2005). Protectia mediului prin agricultura durabila, Partea I, Editura Ceres.

Verain, M.D. (2015). Sustainable food consumption. Product choice or curtailment?", Appetite 91, Elsevier.

Willer, H. & Lernoud, J. (2016). The World of Organic Agriculture. Statistics and Emerging Trends, Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM- Organics International, Bonn.