



ORIGINAL PAPER

Economic and Environmental Sustainability in Agriculture: Organic Agriculture

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Abstract:

Ecological issues are the main concerns of the modern period and are a challenge for the current millennium, occupying a prominent place among the world's global problems, especially due to efforts to ensure full compatibility between economic growth, rational use of resources and maintaining ecological balance. Organic agriculture is a component of sustainable development of this sector of the economy, which aims to harmonize the immediate needs of agricultural products, accepted in terms of quality and health, with the requirements of the laws of nature, respect for long-term ecological balance.

Keywords: *organic agriculture; sustainable development; environment; ecological balance; agricultural production.*

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Introduction

Recent scientific studies in the field of agricultural sciences, deeper understanding of biological and chemical processes in nature, penetration into the mysteries of human-nature relations have generated concerns in the development of alternative cropping systems in agricultural production, considered a replica of industrial agriculture, chemical and high energy consuming, which in many cases does not justify the productions obtained (European Commission, Reconnecting nature, 2015).

The sources of organic agriculture are represented by the three currents that have emerged in Europe. The first is the one that appeared in Germany in 1924 under the impetus of Rudolf Steiner, with the name of biodynamic agriculture. The second current, published in Britain in 1940, was based on the theory developed by Sir Albert Howard and Lady Eve Balfour under the name of organic agriculture. Last but not least, the third current, called organo-biological agriculture, was developed in Switzerland by Hans Peter Rush and H. Müller (Toncea et al, 2013: 11).

The new type of agricultural system has begun to assert itself in many countries of the world and is characterized by its qualities of environmental protection, sustainable exploitation of natural resources specific to this economic sector. The activity of agricultural holdings is based on the practice of modern technologies, created on biological principles, on the use of photosynthesis and solar energy, decomposition and humification, on predominantly organic fertilization and on the cultivation of pedo-ameliorating plants of vineyards and orchards, on systems integrated prevention and control, mainly biotechnology, of pathogens and pests, on the application of new technological methods regarding mechanization and irrigation, on the integration of different agricultural sectors in intensive, sustainable and competitive agrosystems.

Organic Agriculture in the European Union

Ecological agriculture is characterized by the elimination of different types of environmental pollution, generated by agricultural activities, supporting the genetic diversity of species, protecting wild species of plants and animals.

In general, the objectives of organic agriculture are subject to the sustainable development of agri-environmental systems (Davidson, 2005: 8).

The transition to such agriculture has been achieved over time, through a process of changes with moderate tempo, which allows the long-term use of the environment, achieving sustainable development, while maintaining the quality of the environment at an acceptable level. It is known that among its functions the natural factor earth, in this case the soil, also exerts an ecological function, environmental protection, biodiversity conservation and sustainable development (Tapaloaga, 2017: 60).

This ecological function of the soil is expressed by: production of plant biomass, which provides food, feed, renewable energy and raw materials; filtration, tempering and transfer between the atmosphere, groundwater and plants, thus protecting the natural environment; ensuring the habitat conditions and the reserve of genes, fauna and flora in the soil, constituting an important part of biodiversity.

As a result, an increasingly obvious feature of the competitiveness of agricultural activities is the greening of agri-food products, promoting the quality and competitiveness of products obtained, by respecting the ecological balance.

In the European Community, the practice of organic agriculture has been generated by the growing interest of consumers, caused by the needs to ensure food safety and quality of agri-food products, as well as improving the consumption of the population, consuming healthy, clean food to improve population health (Pirvu et al, 2009). Consumption of organic products is lower compared to high consumption of food produced with agrochemicals and agricultural substances. (Reynaldo, et al., 2019: 1083). Starting from these desideratums, the producers, the processors of agri-food products have intensified their preoccupations on the line of the formation of an ecological agriculture, which lately, has become one of the most dynamic sectors of the sustainable agriculture.

To this end, the EU is reorienting its material, financial and human efforts towards achieving sustainable agriculture, towards the application of ecological production methods. In these conditions, clear objectives have been established, which aim at ecological agriculture, among which are:

- avoiding all forms of pollution, both at the level of products and the environment;
- maintaining the natural fertility of the soil, in order to ensure in a sustainable way the food security of the planet;
- ensuring a decent standard of living for agricultural producers;
- the production in sufficient quantities and at an appropriate quality level of the food on which depends, to a large extent, the health of the consumers.

The practical realization of these objectives requires:

- promoting especially those methods of soil cultivation, which ensure its regeneration, mainly by recycling the nutrients contained in the organic matter incorporated into the soil and by applying organic fertilizers and composts. Therefore, the practice of organic agriculture does not mean the complete elimination of chemical fertilizers, but they can be used more rationally, responsibly, only in order to ensure the balance of soil-specific nutrients.
- management in accordance with the requirements of ecological principles, of the living components of ecosystems, by improving cultivated genotypes, by creating new varieties of plants and animal breeds of high yield and with a reduced ecological and genetic vulnerability;
- large-scale use of crop rotations and rotations;
- reconstituting the links between the food chains, by re-establishing close links between the primary producers and the primary consumers.
- ecological management of agroecosystems based on the integration of natural control mechanisms and those of origin.

Organic agriculture makes a major contribution to sustainable development, to the growth of economic activities with an important added value and to the increase of interest for the rural area (Allegra, Zarbà, 2018: 7).

Sustainable and healthy economic and social development, in the long run, at local, national and regional and global level is not possible without the existence of an adequate legislative and institutional framework, through which to ensure economic and ecological harmonization, increase economic and social performance and ecological, changing production and consumption methods (Pirvu, et al, 2011: 224; Pîrvu, Gruescu, 2009: 109-113). Only on such a support can be ensured the expansion of organic agriculture, characterized by an optimal degree of efficiency.

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Since 1992, when European legislation on organic agriculture came into force on the basis of EEC Regulation No. 2078/1992, tens of thousands of farms have been converted into this cropping system and consumers' interest in organic agri-food products has increased, as well as of the competent decision makers.

In this regard, the Johannesburg Declaration on Sustainable Development (2002) states that governmental and political factors have the task of "promoting programs for effective and efficient ecological exploitation, practices to improve soil fertility and control of agricultural pests", in order to "increase viable agricultural production and food security."

The reform package built in AGENDA 2000 placed special emphasis on compliance with environmental protection measures for all types of crops (Avram, 2007:70). Thus, in agriculture certain environmental standards must be observed, without financial compensation and, even more, to respect the principle "the polluter pays". However, in the EU, environmentally friendly farmers take agri-environmental measures and are rewarded with rural development programs. In addition, organic agriculture can be encouraged by investing in primary production and processing. Starting from the fears of consumers, caused by alarming signals coming from the food field and from genetically modified organisms, from ionizing treatments applied to food, norms of great exigency have been developed related to food safety, quality assurance and information regarding the production methods. At the same time, public opinion is increasingly aware of the damage done to the environment through practices that lead to soil, water, air and biodiversity pollution, the depletion of natural resources and the destruction of fragile ecosystems.

Such a perception, organic agriculture initially considered an activity that occupies a small market segment, has become a mode of production of prime importance, an element of the new technical and technological mode of production, in full assertion process, able not only to produce healthy food, but also to respect the environment. It is currently a real opportunity for rural economies to contribute to their sustainable development. The expansion of this agricultural sector leads to the improvement of employment resources, in the field of agriculture, processing and related services.

In the late 1980s, the CAP gave organic agriculture a special role. In addition to reducing surpluses on some agricultural products, the promotion of quality products and environmentally friendly agricultural practices was encouraged. At the same time, in order to increase consumer confidence in organic products, regulations must be developed to frame production and quality policy, as well as measures to prevent fraudulent declarations on the ecological nature of food products. Currently, consumers are increasingly demanding more information on food production methods and want to ensure that all safety and quality precautions and all stages of their implementation have been taken. Governments have set targets for expanding organic production in order to address to these concerns. (Stoian, Caprita, 2019: 276).

Under this aspect, regulations were adopted to guarantee the authenticity of organic agriculture methods, as they constitute a general framework applicable to plant and animal production, but also to the labeling, processing and marketing of food resulting from organic agriculture.

Since the adoption of the first regulation in 1991 Regulation 2092/1991 (EEC) and its entry into force in 1992, many farms in the EU have switched to organic production. Farms that are certified for this mode of agricultural production must have a

conversion period of 2 years (before sowing) in the case of annual crops and 3 years in the case of perennial crops.

The conversion of conventional production into organic production is a complex process, which concerns both the change of interrelationships between living organisms and the environment, as well as the mutual relationship between natural and man-made factors, but also changes that affect the whole rural development.

The conversion of conventional to organic agricultural production is carried out in accordance with national and international ecological standards, in a certain period of time, which depend on the characteristics of crops or animal species. This is authorized by special inspection and certification bodies, which may reduce or extend the duration of the conversion period, in special cases and under the conditions of compliance with the following requirements (Dobrotă, 1997: 56): the lots were already converted or were being converted; the residues generated by the products used for plant protection are insignificant in the soil and in plants (perennials); the production obtained, which has undergone a treatment with chemicals, is not characterized by the specification of ecological product.

In August 1999, Regulation 1804/1999 / EEC on the production, labeling and control of the main species of animals (cattle, goats, horses and birds) was approved. Genetically modified organisms (GMOs) and derived products are expressly eliminated from the area of organic production.

A special importance was given to the control procedures that guarantee the registration at a national inspection body, with competences in the field, of all the farms that want to practice organic agriculture. These institutions are themselves designated by the authorities with competence in verifying the capacities to lead the inspection system in a more equitable and efficient one and to comply with the regulations in force. The inspection is done throughout the production process, including storage, processing and packaging. The holdings are inspected at least once a year and are subject to spot checks. The sanctions provided in case of violation of the regulations are the immediate withdrawal of the right to refer to the ecological production method for the products in question, to which is added higher penalties in case of more serious crimes. Producers are required to keep a detailed register of their agricultural products including, for breeders, the obligation to keep complete registers describing the management systems of the herd.

In the European Union, funds granted to organic agriculture are on an increasing trend. Several regional programs aim at creating new jobs in rural areas, expanding farms that practice organic agriculture, which leads to new positive developments in the sustainable development of rural areas and an ecological approach to the agri-food sector (VAN ASSELDONK, 2019: 40-46). In recent years, both consumer interest in food safety and growing environmental concerns have contributed to the expansion of organic agriculture.

Compared to 2000, when organic agriculture held only 3% of the value of agricultural production in the EU, it has recently become one of the most dynamic agricultural fields, respectively 7-8%. On this basis, the European Commission has proposed a set of measures aimed at accelerating the development of organic agriculture in the Community. This action plan aims to rapidly increase the number of farmers who practice this system of agriculture, due to the fact that there is a significant increase in demand for organic products.

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On 20 May 2020, the Commission adopted the Farm to Consumer Strategy and the Biodiversity Strategy. In line with the European Green Pact, they propose ambitious EU actions and commitments to combat the decline of biodiversity in Europe and around the world and to turn our food systems into global standards for competitive sustainability, the protection of human and planetary health, and the environment subsistence of all actors in the food value chain. The future action plan on organic agriculture, to be adopted in early 2021, will be an important instrument for the future growth of the sector.

The EU's green sector has grown rapidly in recent years in terms of the agricultural area involved, the number of operators and its market share. The total area of agricultural land used for organic agriculture in the EU increased from 9.1 million hectares in 2010 to 14.25 million hectares in 2019, an increase of 56.5%. In 2019, the proportion of EU agricultural land intended for organic production was 7.92%. Over the same period, the value of retail sales of organic products increased from 18.1 billion euros to 30.7 billion euros, an increase of 69%.

Table no. 1. Organic crop area by agricultural production methods and crops (from 2012 onwards). Percentage of total utilised agricultural area

| TIME | 2012 | 2016 | 2019 |
|--|-------|-------|-------|
| Austria | 18,62 | 21,25 | 25,33 |
| Belgium | 4,48 | 5,8 | 6,85 |
| Bulgaria | 0,76 | 3,2 | 2,34 |
| Croatia | 2,4 | 6,05 | 7,19 |
| Cyprus | 3,38 | 4,94 | 4,98 |
| Czechia | 13,29 | 14 | 15,19 |
| Denmark | 7,31 | 7,81 | 10,87 |
| Estonia | 14,86 | 18,02 | 22,33 |
| European Union - 27 countries (from 2020) | 5,88 | 7,09 | 8,49 |
| European Union - 28 countries (2013-2020) | 5,64 | 6,68 | 7,92 |
| Finland | 8,65 | 10,47 | 13,48 |
| France | 3,55 | 5,29 | 7,72 |
| Germany | 5,76 | 6,82 | 7,75 |
| Greece | 9,01 | 6,51 | 10,26 |
| Hungary | 2,45 | 3,48 | 5,71 |
| Ireland | 1,16 | 1,72 | 1,63 |
| Italy | 9,3 | 13,99 | 15,16 |
| Latvia | 10,63 | 13,42 | 14,79 |
| Lithuania | 5,51 | 7,5 | 8,14 |
| Luxembourg | 3,14 | 3,47 | 4,42 |
| Malta | 0,32 | 0,21 | 0,47 |
| Netherlands | 2,61 | 3,03 | 3,75 |
| Poland | 4,51 | 3,72 | 3,49 |
| Portugal | 5,48 | 6,74 | 8,16 |
| Romania | 2,1 | 1,67 | 2,86 |
| Slovakia | 8,53 | 9,75 | 10,31 |
| Slovenia | 7,32 | 9,12 | 10,35 |

| | | | |
|-----------------------|-------|------|-------|
| Spain | 7,49 | 8,48 | 9,66 |
| Sweden | 15,76 | 18,3 | 20,43 |
| United Kingdom | 3,41 | 2,82 | 2,62 |

Source: https://ec.europa.eu/eurostat/databrowser/view/org_cropar/default/table?lang=en

Organic Agriculture in Romania

Organic agriculture in Romania is a new, dynamic sector, in full assertion, a part of the sustainable development of agriculture in rural areas. The role of this agricultural economic sector is expressed by its contribution to increasing the biodiversity of plants and animals, increasing the biological activity of the soil and maintaining its long-term fertility, recycling waste from agricultural production and ensuring the healthy use of soil, air, water and biodiversity, to obtain clean, healthy products, as a result of reducing to a minimum the pollution of the environment. This type of agriculture is a sector of great perspective for Romania, due to the fact that it enjoys appropriate conditions for the development of such a system of agriculture, fertile soils and low level of pollution of the countryside, by comparison with the economically developed countries, where super intensive agricultural technologies are used extensively, based largely on chemical fertilizers and pesticides (Ilie, 2013; Gonciarov, 2014).

Through its content, ecological agriculture is characterized by a set of agricultural systems, methods and processes, which promote sustainable economic development, protection of human, animal and natural health.

Organic agriculture is a global system of agricultural management and food production that combines best environmental practices, a high level of biodiversity, conservation of natural resources, the application of high standards of animal welfare and a production method that respects the preferences of certain consumers for products obtained with the help of natural substances and processes.

In Romania, the control and certification of ecological products are provided by private Inspection and Certification Bodies (ICB). These are approved by the Ministry of Agriculture and Rural Development, approval preceded, obligatorily, by their accreditation by an accreditation body (in Romania it is RENAR). (SRAC, Ecological Agriculture).

Organic agriculture has emerged as an alternative to conventional, industrial agriculture, which is increasingly showing its limitations and the surplus of negative consequences. On the quality of the obtained products and the environment, as a result of the excessive use of chemicals, which strongly affect the health of people, animals and soil quality. Due to its content, organic agriculture differs substantially from other modes of agricultural production because it highlights unconventional and recyclable resources, thus restoring to the soil its nutrients from organic materials.

In the field of animal and poultry breeding, the regulation of meat production ensures a special type of development and a natural diet. Organic agriculture respects nature's self-regulatory systems in the fight against crop pests and plant diseases and avoids pesticides, herbicides, chemical fertilizers, as well as growth hormones, antibiotics or genetic modifications. Instead, techniques and technologies based on neofactors are used, which favor the creation of sustainable ecosystems and reduce pollution, without completely eliminating the use of synthetic chemicals, within certain limits necessary to provide the soil with nutrients necessary to maintain its quality.

With its fertile and productive soils and a large expanse of arable land, which in the 90s of the last century and now, used a small amount of chemicals, Romania has

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favorable conditions to ensure the promotion and expansion of organic agriculture, offering chances to produce and export clean products at attractive prices.

In our country, organic production is defined by obtaining agri-food products without the use of synthetic products, in accordance with the rules of organic production, which comply with national guidelines and specifications and are certified by an inspection and certification body established for this purpose. Ecological food production envisages the realization of sustainable, diversified and balanced agricultural systems that ensure the protection of natural resources and the health of consumers.

Production methods used in obtaining unprocessed primary vegetable products, unprocessed animal and animal products, processed vegetable and animal production, intended for human consumption, products prepared from one or more ingredients of vegetable and animal origin, feed and raw materials must meet the following conditions: compliance with ecological principles; non-use of fertilizers and soil improvers, pesticides, feed materials, food additives, food ingredients, substances used in animal feed, feed preparation substances, products for cleaning and disinfecting animal shelters and other products, than those used in organic agriculture; the use of seeds or planting vegetative material obtained by ecological production methods.

The basic principles of organic agri-food production are: elimination of any polluting technology; realization of production structures and crop rotations, in which the main place is held by breeds, species and varieties with high adaptability; continuous support and improvement of the natural fertility of the soil; integration of animal husbandry in the production system of plants and plant products; the economic use of conventional energy products and their replacement to a greater extent with the rational use of reusable by-products; application of technologies in plant culture and animal husbandry to meet the requirements of species, varieties and breeds.

At present, the necessary framework has been provided for the development of an ecological agriculture, on the basis of which the competent bodies have been set up, responsible for the development of this agricultural sector.

The objectives, principles and rules applicable to organic production are contained in Community and national legislation in this field. These rules, together with the definition of the production method in the plant, animal and aquaculture production sector, also regulate the following aspects related to the organic agriculture system: processing, labeling, trade, import, inspection and certification.

The provisions on the labeling of products obtained from organic agriculture, laid down in Regulation (EC) No. Council Regulation (EC) No 834/2007 on organic production and labeling of organic products and in Regulation (EC) no. Commission Regulation (EC) No 889/2008 laying down detailed rules for the application of Regulation (EC) No 834/2007 are very precise and aim to provide full consumer confidence in organic products, as products obtained and certified in accordance with strict rules of production, processing, inspection and certification.

Following the controls carried out by the inspection and certification bodies, the operators who have complied with the production rules will receive the organic product certificate and will be able to label their products with the mention “ecological”. The following shall be affixed to the label affixed to an organic product: reference to the organic production, the logos, the name and code of the inspection and certification body which carried out the inspection and issued the organic product certificate.

Until 2019, 9821 operators were registered in Romania, and the total ecologically certified area was 395227.97 ha, the largest in the last nine years. In 2018,

9008 operators were registered, the first increase after a significant decrease recorded for several years: from 15544 in 2012 to 8434 in 2017. At the same time, in 2018, the total certified area was 326,259.55 ha, higher than in previous years. For example, in 2017, it was 258470,927 ha, and in 2016.

At the same time, the quoted source reported that the area with ecologically certified vegetables decreased from 983.10 ha in 2018 to 804.29 ha in 2019. The peak was reached in 2017, 1458.78 ha. In three years, about 654 ha cultivated with vegetables came out of organic agriculture. Romanian vegetables are often presented, even by politicians, as the healthiest agricultural products for public consumption. At the same time, the vegetable growers' associations are the most vocal in their relationship with the central authorities, requesting both financial aid and free access to the shelves of supermarkets.

Table no. 2. Dynamics of Operators and Areas in Organic agriculture

| | 2010 | 2013 | 2016 | 2019 |
|--|--------|--------|--------|--------|
| Number of certified operators in organic agriculture | 3155 | 15194 | 10562 | 9821 |
| Total area in organic agriculture (ha) | 182706 | 301148 | 226309 | 395227 |

Source: MADR, Dynamics of operators and areas in organic agriculture, <https://www.madr.ro/docs/agricultura/agricultura-ecologica/2020/Dinamica-operatorilor-%C8%99i-a-suprafe%C8%9Belor-%C3%AEn-agricultura-ecologic%C4%83.pdf>

Also, according to the annual reports published by the Romanian authorities, the vegetable samples from our country are the most contaminated with pesticide residues, even exceeding the maximum allowed level.

At European level, in 2019, Romania occupies the penultimate place in terms of the share of ecologically certified area within the entire agricultural area, with a percentage of only 2.86% (see table 1). After Romania were Ireland and Malta. In first place was, in 2017, Austria, with 25.33% eco-cultivated area.

Organic agriculture is subsidized from both the European and national budgets. At the level of 2017, one hectare of eco-cultivated land was allocated an average subsidy of 326 euros, of which 305 euros from the EU budget and 21 euros from the national budget. There is also financial support for conversion, between 365 euros / year and 620 euros per year and direct payments, in the amount of 73 euros to 442 euros per year, depending on the type of culture (Lengher, 2020). The subsidy for organic agriculture is higher than the subsidy for conventional agriculture.

Conclusions

Due to the special importance of this new alternative type of agriculture, the competent factors in the field of this activity economy and farmers have intensified their preoccupations for its extension, establishing in this sense priorities, objectives and precise measures, among which are: this sector and the creation of an internal market for organic products, with a potential contribution to meeting the needs of society with healthy products, unaffected by pollution, food safety and activities compatible with natural walking, thus ensuring ecological balance; increasing the contribution of organic agriculture to the promotion of viable rural economies, by occupying the population in rural areas and increasing the interest in practicing organic agriculture, promoting the

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sustainable development of rural communities; establishing the legislative framework in accordance with EU norms, by fully transposing Community legislation into national legislation.

The development of the organic sector is mainly evidenced by the increase in the number of producers involved. With an average annual growth rate of 24%, the exponential development of the organic sector in Romania is proven mainly by the increase in the number of producers involved, while multiplying the areas cultivated in the organic system. (Dobrea, et al., 2018). They argue that the application of eco-principles leads to a decrease in agricultural production. In addition, beneficiaries (traders, processors) do not pay for organic goods at higher prices than conventional goods.

At the same time, Romanian consumers do not have an eco-developed culture, as it is in some western states. Recent studies indicate that Romanians confuse the certified organic product with products delivered under various labels: cultivated in the country, traditionally grown, etc., without being obtained in compliance with ecological principles and under the supervision of a specialized body, authorized.

Without underestimating this support, however, the following question arises: can these amounts subsidized by existing organic farms be absorbed, given that the conversion from traditional to organic farms takes at least two years.

The positive results obtained in the development of organic agriculture form the logical support of the continuity of its expansion. The strategy for sustainable development of agriculture and food (MAPDR, May 2004) places organic agriculture at the center of the development of Romanian agriculture, being considered an engine of development. Through this programming document, at the horizon of 2025, the greened area will occupy 30% of the agricultural area of the country, ie about 450,000 ha. Furthermore, organic agriculture will need the support of research and innovation, as well as sustainably funded extension services, to help farmers adopt production systems based on integrated soil and water management and the use of organic fertilizers with a increased water retention capacity (MADR, 2015, Strategy for the development of the agri-food sector in the medium and long term 2020-2030). These would be the first steps towards promoting the expansion of organic agriculture. These products, although targeting a smaller market segment, have higher prices and can bring greater benefits, especially to small farms that can meet certification requirements. For the next period, it is expected to expand the events promoting Romanian products in the EU and in third countries by capitalizing on funding opportunities from European and national funds.

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