



The New Circular Economic Model for Sustainable Food Production and Consumption

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Abstract

The transition from the traditional economic model, focused on the consumption of natural resources, to the circular economy based on the reintroduction of secondary raw materials into the economic flow is the solution for economic agents to generate significant comparative advantages and to improve productivity, profit, total and unit costs associated with production. The development of a sustainable future depends on the implementation of the principles of sustainable growth in all economic sectors, including organic farming. The purpose of this paper is to review recent research into the new circular economic model for sustainable food production and consumption. The findings illustrate the main research and development funding programs for sustainable food production at the European level. The main economic, social and environmental benefits of sustainable food production programs are presented and several future directions for European sustainable food production and consumption are emphasized.

Keywords: circular economy, food consumption, food production, sustainable consumption.

Introduction

The need for a transition to sustainable economic models has become increasingly present in the economic literature (Long, Looijen & Blok, 2018; Morone, Falcone & Lopolito, 2019), as a result of the damage that

intense economic activity has caused to natural resources, be it water, soil, fauna and flora, protected species or natural habitat. Against the background of a significant increase in population and as a result of the significant improvement in living standards, generated by the increase in average incomes,

in recent decades there has been an accelerated increase in consumption of natural resources globally. This creates a vicious circle, in which the increase of the population's income determines the increase of consumption, implicitly the demand for raw materials used in the production processes. In conjunction, the decrease in the quantities available for extraction influences the increase in the purchase price of resources (Naylor et al., 2009; Deac et al., 2016).

The depletion of natural resources, as well as their intensive use, beyond the regenerative capacity, makes certain economic sectors vulnerable, including agriculture (Hajer et al., 2016). In this respect, the scarcity of resources as well as the intensive use of agricultural land have been intense research topics, especially in recent years (Rosegrant et al., 2014; Guillaume et al., 2016; Charania & Li, 2020). The limitations of the linear model, focused on extraction, production and consumption have determined the need to introduce a sustainable alternative, a regenerative model focused on streamlining the exploitation of resources, mainly soil, reducing the amount of waste generated and reintroducing them into the economic flow. The three principles underlying the new circular paradigm are: reduce, reuse, recycle (Goyal, Esposito & Kapoor, 2018; Yu et al., 2021). In this context, the topic of the circular economy has become a priority on the public agenda, being frequently introduced in debates not only in the closed and exclusive circuit of the academic environment (Fratini, Georg & Jørgensen, 2019; Marrucci, Daddi & Iraldo, 2019), but also in the specific debates of political decision-makers, both at national and body level, thus gaining global value. Understanding the importance of a paradigm shift in terms of resource efficiency and productivity growth, there are states that successfully implement the circular model of economic development to maintain their global competitiveness. In a competitive global market, organizations need to build their competitive advantage on research and

continuous innovation (Girneata & Dobrin, 2015).

Current generations can build a sustainable future by ensuring food security through the transition to a sustainable production system that allows for appropriate agri-food products (Miranda et al., 2019), both qualitatively and quantitatively, responding to new consumption patterns focused on the nutritional quality of food, but also a growing demand. In this regard, the continuation of European public policies to finance the process of transition to circularity, by increasing the share of organic farming, both in terms of organic farming in the total agricultural area used and in terms of the number of farmers employed in this process, respectively market of organic products, will allow the economic development of the agricultural sector, making it more attractive for investors, but also for the young and educated workforce.

It is well known that the population will explode, causing a steady increase in food demand. Thus, food production will have to increase proportionately to cover the significant difference in demand, resulting from the increase in population from 6 billion to about 10 billion by 2100 (Sakschewski et al., 2016). The food production process must be developed from the perspective of the need to feed over nine billion. which means that food availability must expand globally by 60% and up to 100% in developing countries.

Given that globally available arable land is already exploited, with agriculture competing with other economic sectors, such as construction, urban and industrial development, for its exploitation, the increase in quantities produced must be covered mainly as a result of improved agricultural production techniques (Bruinsma, 2017). Increasing agricultural productivity thus becomes vital, although difficult to achieve given that poor use of irrigation systems and poor management of producing farms have already led to irreparable degradation of soil quality over large areas (Bruinsma, 2017). In order to achieve higher yields per hectare

cultivated, in conditions of soil protection and in compliance with measures to ensure its regenerative capacity, investments must be continued in research and innovation, in order to identify specific and necessary solutions to meet new global challenges: reducing malnutrition; adaptation to climate change; increase productivity; reduction of nutritional risks; decrease in food diversity (Fanzo et al., 2018).

The negative effects of climate change require measures to adapt production patterns so that the already visible effects can be mitigated and the pace of environmental degradation slowed down (Arora, 2019). Equally, adaptation to climate change involves the implementation of European legislation on air quality, so as to approach the level recommended by the World Health Organization. In this regard, achieving the greenhouse gas emission targets (mainly through the integrated approach to industrial emissions, both current and accidental) will reduce air pollution and thus the impact on quality of life, biodiversity and ecosystems.

Literature Review

Sustainability and efficient consumption of natural resources have become topics of debate, mainly in scientific research, being subsequently taken up in wider debates and assumed by decision-makers as a sustainable direction of development (Ahmed et al., 2020). In the circular economy, products are designed to be sustainable, so that they can be reused, disassembled, reconditioned or recycled. Thus, the circular economy manages to multiply the consumption of materials by the income generated (Savini, 2021), as a result of the reuse of considerable quantities of materials recovered from end-of-life products which, in the linear model, would have been considered outside the economic process.

The development of a sustainable future depends on the implementation of the principles of sustainable growth and innovation (Dima, 2021) in all economic

sectors, including organic farming. The increase of the population as well as the increasing interest for healthy food, for agri-food products with superior nutritional value, to the detriment of genetically modified organisms, represent the premises underlying the development of sustainable agricultural practices, respectively the transition to organic farming (Batini, 2019). Given the importance and topicality of the subject, in the context of placing sustainable development as the official goal of the UN, organic farming has been a highly addressed topic in recent years, both in scientific papers and in research articles or international conferences (Eyhorn et al., 2019; Khadda, 2021; Tschardt et al., 2021). There are many definitions that have been formulated by both international bodies and established researchers, but they all converge on a common denominator, defining organic farming as a system that relies on ecosystem management rather than external inputs, taking into account the potential environmental and social impact by eliminating the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary medicines, genetically modified seeds and organisms, preservatives, additives and irradiation, which are being replaced by area-specific management practices, which maintain and increase long-term soil fertility, preventing pests and diseases.

The increase in the significance of the circular economy is also reflected in the increase in the interest that the academic environment attaches, globally, to this subject. In this sense, in the last decade, there can be a significant increase in the number of academic articles as well as authors researching various aspects related to the concept and implementation of the circular economy (de Abreu & Ceglia, 2018; Kalmykova, Sadagopan & Rosado, 2018).

The circular economy has its conceptual roots in industrial ecology, which provides a form of material symbiosis between different companies and different production processes (Dima, 2018). Industrial ecology

emphasizes the benefits of waste recycling by developing complex interconnections, such as those in famous industrial symbiosis projects (Andersen, 2007). Industrial symbiosis allows the creation of synergies related to recycling and reuse processes, allowing SMEs to use as resources the by-products and waste resulting from economic activity.

One of the most complete definitions of the circular economy refers to a regenerative system that simultaneously achieves the reduction of the number of resources consumed, the decrease of the amount of waste and emissions generated, as well as the reduction of energy losses, by slowing down, closing and narrowing the materials and energy loops (Suárez-Eiroa et al., 2019). All these processes are performed as a result of sustainable design, maintenance, repair, reuse, reconditioning and recycling (Geissdoerfer et al., 2017). The circular economy can be defined as the optimal solution to a whole package of problems that the linear model faces, namely the amount of waste generated, the scarcity of resources and supporting the pace of economic growth (Lieder & Rashid, 2016).

The transition from the traditional economic model, focused on the consumption of natural resources, to the circular economy based on the reintroduction of secondary raw materials into the economic flow, as a result of waste reduction, recycling and reuse (3R principle), is the solution by which European economic agents can generate significant comparative advantages, significantly improving its performance indicators such as productivity, total and unit costs associated with production and, last but not least, profit. According to the principles of the circular economy, the introduction of environmental concerns in the production equation will allow the modernization of the European economy, its orientation towards a direction of sustainable development, with multiple benefits: increasing competitiveness; innovation; generating new jobs; social inclusion; the well-being of citizens. The implementation of the circular economy means first of all the recovery of waste by respecting the order of priorities of treatment operations, as provided by the waste pyramid (Fig 1).

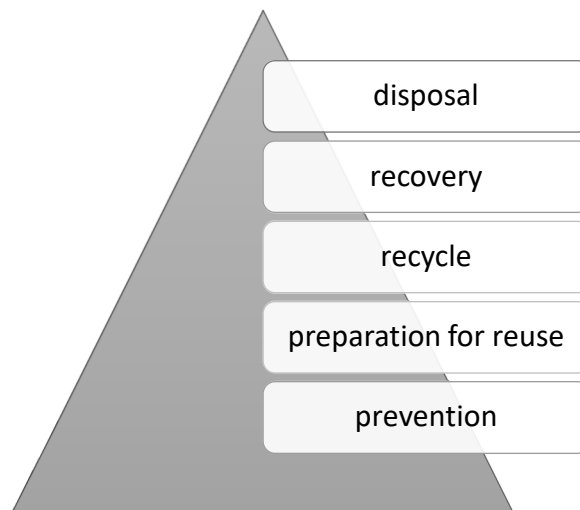


Fig 1. Waste pyramid

Source: Author, based on literature review

The implementation of an efficient economy in terms of resource use is based on the

principle of the 3Rs: reduce, reuse, recycle. Each of the three types of action plays a key

role in the integrated waste management system. Thus, by reduction we mean the preventive actions as a result of which the quantities of waste generated are minimized. Reusing involves increasing the life cycle of products, using them for as long as possible beyond the principle of planned obsolescence, in order to delay as much as possible, the entry of products into the waste stream. Recycling instead involves reprocessing materials into new raw materials or products (Cuc et al., 2015). Recovery and storage are at the heart of the waste management pyramid. If recovery is aimed at recovering energy from waste incineration, disposal must be the last resort in the life cycle of a product or material and will apply strictly to those resources that can no longer be reused, recycled or recovered.

The differentiated collection, respectively the efficient waste management are decisive in the success of the implementation of a sustainable economic model because through the correct implementation, they allow the reintroduction of valuable materials in the economic flow. In the absence of efficient integrated waste management systems and poor collection, the loss of valuable resources will be perpetuated, with serious consequences both economically and on the environment. These principles will have to be applied consistently for all categories of waste, whether generated by households or as a result of economic activity: construction, industry or mining. As part of the legislation on the development of the circular economy, the objectives set at the European Union level in terms of ensuring energy efficiency of at least 32.5% by 2030, as well as the identification of renewable energy sources, through which to ensure at least 32% of total energy consumption is fully in line with the targets set by the signing of the Paris Agreement on climate change, in terms of reducing the total level of greenhouse gas emissions by at least 40% by 2030, level calculated by reference to 1990 (European Commission, 2019).

Research Methodology

The primary purpose of this empirical research is to explore the new circular economic model for sustainable food production and consumption from a theoretical point of view. In view of this aim, on the basis of various recent reports, articles, case studies, and textual analysis, qualitative research was used. As a result, an extensive literature assessment was done, that included analysis of several scientific publications, books, and specialized reports that addressed the new circular economic model for sustainable food production and consumption.

The findings are aimed at achieving the following goals:

- presenting the main research and development funding programs for sustainable food production at the European level;
- highlighting the main economic, social and environmental benefits of sustainable food production programs;
- emphasizing future directions for European sustainable food production and consumption.

Research and Development Funding Programs for Sustainable Food Production

Given the importance of innovation in identifying alternative raw materials, new technologies to support sustainable production, as well as sustainable consumption patterns, funding for research and development programs is one of the priorities of the circular economy transition mechanism. One of the financial support framework programs for the circular economy, dedicated to providing financial support to waste reduction, recycling and reuse projects is Horizon 2020 or the LIFE program, carried out in the period 2014-2020. At the same time, funding provided through the EU's SME Competitiveness Incentive Program, COSME, as well as

structural and investment funds, needs to be targeted primarily at supporting innovative, sustainable business models that ensure resource-efficient consumption. Equally, through the policies promoted by the European Parliament and the Commission, the guidance of all Community funds, including the European Fund for Strategic Investments (EFSI), the funds allocated through the Cohesion Policy of the European Union, as well as those granted by the European Investment Bank (EIB) were mobilized to promote resource efficiency and waste recovery, in line with the hierarchical system imposed by the waste pyramid. Both the European Parliament and the Commission encourage the efficient use of European funds and investment by ensuring that waste prevention and recovery actions are financed, in particular, before recycling. To this end, the aim is to create a favorable financial framework that allows local authorities, in particular, to simultaneously access Horizon 2020 and the Structural and Investment Funds, in order to speed up the effective transposition of European waste targets.

The reports prepared by the European Parliament's Specialized Committees emphasize the importance of directing investment towards research and innovation - a key aspect in the development of the European circular economy, focusing on identifying and promoting sound solutions for the differentiated collection, sustainable consumption and production, resource productivity and protection. environment. For example, the elimination of all subsidies granted for environmentally harmful production or consumption practices, including those granted for the production of energy from the biodegradable fraction of industrial and municipal waste, as well as subsidies for fossil fuels. Given the distinct results of the Member States, both in terms of waste production and in terms of recycling, stimulating innovation, funding models, public-sector involvement in supporting the transition to the circular model (by adapting the governance model,

by public procurement carried out or by adapting the taxation system, taking over the models of good practice from European countries with remarkable results in the circular economy and transforming them into a "modus operandi"), will ensure the achievement of the assumed objectives.

The circular economy, therefore, involves reforming the linear patterns of consumption and production, by assuming circularity and sustainable principles, focused on extending the life cycle of products as a result of the repair and reuse of finished products, respectively as a result of material recycling. This combats the principle of scheduling wear and tear, which emphasized the need to systematically replace products according to a pre-established timetable, reducing the total amount of waste generated annually. Encouraging consumerism is contrary to the principles of the circular economy, which militates to increase the life of the product, for its ecological design so that the repair is easy and cheap to perform, by strictly replacing the defective part, and when it is necessary to remove the product from use, it can be reused or recycled. The role of the design phase becomes essential in the process of transition to a sustainable economic model, as the potential resources consumed by a product throughout its useful life, as well as its potential for repair, reuse and recycling, are largely established in the design phase. That is why it is necessary to introduce a unitary European methodology for establishing the ecological footprint of products.

Economic, Social and Environmental Benefits of Sustainable Food Production Programs

In order to extend the life of products, European legislative reform on the circular economy encourages the development of public-private partnerships in order to develop four new sustainable design models for goods and services: a design for longevity; rental/service design; design for

reuse in production; design for capitalizing on materials. Eco-design and reuse could generate net savings estimated at around € 600 billion in European companies, public authorities and end consumers in the European single market (Pitkänen et al., 2020).

In the global process of reconciling the environment and the economy, each actor has a key role to play, but the key element in the process of transition to the circular economy must be the small and medium enterprise, as at the EU level, SMEs account for 99% of the total number of companies (Papadogonas, 2007), providing two-thirds of the total number of jobs. Thus, the achievement of the objectives of the circular economy will be achieved by ensuring a unitary legal framework, by the information and ongoing support provided by the European institutions to each Member State in transposing and implementing legislation, by directing structural and investment funds to innovative projects for the reduction, reuse and recycling of waste. Also, the direct involvement of producers, by extending their responsibility both in terms of prevention and in repairing the damage caused to the environment as a result of the activity carried out, with clear financial sanctions otherwise, will allow a significant reduction of cases of damage caused to the environment. At the same time, it is necessary to make the final consumer responsible, in order to reduce food waste as an important source of waste. In addition, informing and educating European consumers about the separate collection will allow the growth of the secondary raw materials market, as an essential condition for the development of the secondary raw materials market. Implementing the principles of the circular economy is the viable solution to regaining the competitiveness of the European economy globally, with multiple benefits for SMEs in terms of production costs and business opportunities, through access to markets in sectors focused on green principles, markets that have increased spectacularly. An

economy must have a strong business climate in order to flourish, which must stimulate the population's entrepreneurial capacity and financial investors to build new firms (Trifu, Gîrneacă & Potcovaru, 2015).

At European level, estimates of the benefits of implementing the circular economy package provide for net savings for companies and consumers estimated at around € 600 billion, as well as an increase in economic efficiency of around 30% by 2030, which would lead to a 1% increase in European GDP. The economic benefits are doubled by the social ones as a systematic increase in resource efficiency, by 2% per year, would contribute to the creation of about 2 million new jobs by 2030. At the same time, according to European Parliament estimates, the new targets on waste management as a result of the revision of the legislation, could lead to the creation of around 180,000 sustainable jobs by 2030.

According to a report by Green Alliance, the implementation of circular economy strategies would reduce the number of unemployed by about 280,000 in only 3 countries: Italy, Germany and Poland. In order to analyze the impact produced on the labor market by the transition to the circular economic model, as well as its evolution trend - in relation to the desideratum communicated at European level, the evolution of the number of jobs generated in the fields associated with the circular economy must be analyzed. It should be noted that jobs are expressed in absolute terms, as a number of people, and relatively, as a percentage of total employees at EU28, including only employees of companies operating in the recycling, repair and reuse sectors, as well as in rental and leasing.

The economic and social benefits are complemented by those brought to the environment. Thus, the implementation of the new legislative measures related to the circular economy package would generate a further reduction of CO₂ emissions into the atmosphere by about 600 million tons by

2035, which corresponds to an annual average of about 30 million tons. Instead, production models have improved in the EU, with green models being adopted. In this regard, since 2003, the number of organizations voluntarily implementing an environmental management system in accordance with the Environmental Management and Audit System (EMAS) has increased significantly. EMAS is an environmental performance management tool that allows any company, authority or public institution to participate voluntarily in the Community management and audit system, with the aim of continuously improving environmental performance.

Sustainable production systems have also been adopted in agriculture. Thus, since 2005 there has been an increase in the share of organic farming, also based on the increase in sales of organic products on the EU28 food market. This increase was determined by the awareness of the superior nutritional values of organic products but also by the importance of protecting the environment. The European Union has set itself a new set of ambitious environmental protection goals. In order to combat climate change, the EU has set new targets for reducing greenhouse gas (GHG) emissions. Thus, compared to the values recorded in 1990, GHG values are to be reduced by at least 40% by 2030 and by 89-95% by 2050, respectively (Kawase & Matsuoka, 2013). The aim of setting these new targets is to reduce the impact of emissions on the environment and the improvement of air quality, with positive effects on ecosystems and biodiversity, as well as the quality of life by reducing the impact of air pollution on human health.

European policy and legislation set specific targets for the prevention and control of industrial emissions, with significant potential benefits in terms of soil, water and air protection, waste prevention and management, and improving energy efficiency. Regarding the results of environmental protection, generated by the

transition to the circular economy as a whole, the European Parliament's estimates indicate a reduction in CO₂ emissions of 450 million tons per year, which corresponds to a decrease of between 2% and 4%. Regarding the typology of emissions according to the pollutant, about 81.2% of the total generated is CO₂. At present, the market for secondary raw materials is not sufficiently developed and the cost associated with recycled materials is higher than that of natural resources. At the same time, at the European level, about 60% of all waste generated is not recycled, and recycled materials cover only 10% of what is needed.

In order to discourage the linear model of production and consumption, it is essential that the European Structural and Investment Funds be geared to the objectives of the circular economy, and the success The European transition is conditioned by the individual outcome of each of the 28 Member States. That is why a problem that needs to be addressed quickly is the unitary system for monitoring the results of each state in terms of recycling, prevention, pollution or sanctions applied, with objective and clear criteria, allowing for centralization and data processing.

The implementation of the circular economy is not limited to efficient waste management, the application of its principles generating huge benefits in different areas such as organic farming, energy efficiency through renewable energy, efficient consumption of resources, reduction of soil, water and air pollution, including climate change mitigation. Ensuring the protection of the environment within a sustainable production process additionally makes the producer responsible, which thus acquires a central role in the implementation of the circular economy.

Stocks of materials engaged in global production are still sufficient to meet consumer demand, although the impact of their use on the environment is major. Thus, in the last 50 years, the demand for materials

has increased fourfold, currently registering the fastest growth rate. In this context, the planet's regenerative capacity is exceeded every year by the accelerated pace of material consumption, and estimates of future consumption are not optimistic. Over the next 40 years, material consumption will double, so the impact on the environment will become irreparable (Graedel, 2011). The transition from the logic of the linear economy, which does not include any measures related to waste management, must be achieved as soon as possible by implementing efficient measures related to both reducing the amounts of waste generated by economic activities and the resulting waste recycling capacity following production processes.

In order to accelerate the transition process from the linear model, which has proved its limits, being strictly focused on the consumption of natural resources, extracted or imported, to the circular economy, defined by introducing environmental protection in the priority principles under which both production as well as consumption, a significant increase in the efficiency with which natural resources are used is required. At the same time, in order to reduce the negative consequences of the consumption of materials, it is necessary to make this consumption more efficient. Achieving this goal can be achieved by corroborating four types of measures, respectively:

- *increasing the durability of products;*
- *modularization and reconstruction;*
- *re-use of components and*
- *design of products with less material consumed.*

In order to achieve the set objectives for the Member States by adopting the reform package on the circular economy in May 2018, a constant assessment of annual results is required, based on a unitary reporting, in accordance with the rules set out in European directives. There are a number of performance indicators in the

field of the circular economy, but both the OECD and the G8 Group use, in particular, resource productivity.

Future Directions for European Sustainable Food Production and Consumption

In the context of the many constraints on access to natural resources, generated by the population explosion, the development of emerging markets and the growth of the average income of the population, which will allow access to 3 billion people in the middle class by 2030, the European Union has decided to swiftly implement the transition from the traditional economic model, focused on excessive resource consumption, to sustainable production and consumption patterns, enabling economic development while protecting the environment, generating well-being, social inclusion and efficient use of resources. Ecological agriculture ensures the obtaining of quality, healthy agri-food products, without additives, by using sustainable production practices and mechanisms, which allow the restoration and conservation of the environment, mainly the soil. The transition to organic agricultural production allows for both sustainable economic growth, through the efficient use of resources, and rural development, as a result of the optimal use of available natural resources. This achieves a gradual development of the market for organic agri-food products. Economic development in the next financial years must respect the principles of circularity so that even agricultural production must integrate the goal of sustainability. In this regard, it must be established to what extent the new Common Agricultural Policy – post-2020, will introduce sustainable development objectives and identify the right measures to solve farmers' problems, an important part of which is caused by climate change.

Given the fact that secondary raw materials cover only 10% of the necessary resources, and their manufacturing process is still expensive, the deterioration of the

environment determines the vulnerability of the supply of resources, especially in the agri-food sector. The demographic explosion of the last decades, but also the increase of the population's income through the development of emerging economies, has determined the significant increase of the demand for agri-food products, including on the market of ecological agri-food products.

At European level, farmers must ensure the supply of the approximately 500 million inhabitants, respecting the quality standards and the European legislation in force, as well as the increasing orientation towards sustainable production models. There is also a trend towards a change in consumer behavior in the field of agri-food products, with a growing demand for organic products. As a result of numerous campaigns to raise awareness of the impact that food has on people's well-being and health, there is a substantial increase in demand for organic agri-food products with a low content of toxic substances. In fact, the entire organic food industry, estimated at billions of dollars, is growing annually based on the perception of end consumers that organic food is healthier due to its low toxic content and higher nutritional value. This perception is confirmed by research studies which show that although the nutrient content of organic products differs from one farmer to another and from year to year, depending on different variables such as the difference between soil structure and organic farming maturity, the cultivated variety or soil quality, in general organic agri-food products have a higher nutritional value.

Therefore, it has been shown that, compared to the values recorded by non-organic varieties of the same products, organic varieties provide significantly higher levels of vitamin C, iron, magnesium and phosphorus, while the content of nitrates and pesticides is low. In addition, organic foods, with the exception of wheat, oats and wine, have a richer content of antioxidant phytochemicals. The importance of antioxidant quality is associated with

consumers' perception of health, although it has not been shown in in vivo studies that organic foods have a stronger antioxidant effect, thus being stronger suppressants of the mutagenic action of toxic compounds and slowing the proliferation of certain lines of cancer cells. Given the predominantly positive perception of the consumption of organic products, the evolution of the market for organic agri-food products is expected to be positive in the coming years.

Conclusion

The circular economy is a sustainable alternative to the linear development model, being focused on implementing sustainable consumption and production principles, which involve streamlining resource consumption by extending the life cycle of products and implementing an integrated waste management system. The construction of the circular economic model, focused on reuse and recycling, as well as on increasing the efficiency of resource use is the only viable solution to maintain the same standard of living and protect the environment, as well as ensuring quality of life and food security. Equally, the implementation of the circular model of economic development in the agricultural sector allows to meet the requirements of a segment of consumers increasingly concerned about the quality and health of agri-food products, by increasing the share of organic farming. The ethical consumer is becoming increasingly representative of the European market, and agricultural producers and operators in the agri-food sector, whether referring to processors, distributors or importers, will have to adapt to the new structure of demand.

The transition from the traditional economic model, focused on the consumption of natural resources, to the circular economy based on the reintroduction of secondary raw materials into the economic flow, as a result of waste reduction, recycling and reuse (3R principle), is the solution by which European economic agents can generate

significant comparative advantages, significantly improving its performance indicators such as productivity, total and unit costs associated with production and, last but not least, profit.

Circularity is the only way in which the well-being of European citizens is still ensured and the environment is protected, with minimal interference in the balance of ecosystems as a result of economic activities. In this respect, the extended liability of producers, as well as the prioritization of preventive actions or the implementation of the "polluter pays" principle, are concrete measures by which the European legislator has created a single framework that he has imposed on Member States so that the principles of the cycle economy are important actors: producers, consumers, national control institutions, NGOs.

According to the principles of the circular economy, the introduction of environmental concerns in the production equation will allow the modernization of the European economy, its orientation towards a direction of sustainable development, with multiple benefits: increasing competitiveness; innovation; generating new jobs; social inclusion; the well-being of citizens. The circular economy is an irreversible trend, but further efforts are needed to implement circularity by expanding to new sectors so that European producers can gain a competitive advantage and gain global supremacy in the design and marketing of circular products and services.

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