

## **CIRCULAR ECONOMY IN THE FOOD AND DRINKS SECTOR- A ROMANIAN OVERVIEW**

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**Abstract:** *In recent years, the concept of circular economy has gained increasing traction around the world to create sustainable economic growth and reduce waste and environmental impact. Romania, like many other countries, has been working to adopt circular economy principles and practices in its own economy, with varying degrees of success. My research consists of a document analysis of the most recent Government Decision, no. 1172/2022 regarding the National Strategy for circular economy. I focused my research on the food and drinks sector, the main research objectives being to identify the problems and the solutions to the problems from the circular economy perspective in the sector mentioned. The main problems consist of low recycling rates, high food waste rates and the main solutions are found in education for a sustainable development to reduce the food waste and reducing the use of plastic in packaging and promoting the use of recycled materials.*

**Keywords:** *circular economy, sustainability, Romania, food sector.*

### **Introduction**

Sustainability and circular economy are two intertwined concepts that have gained immense importance in recent years. Sustainability or the sustainable development was defined as follows: “Sustainable development is development that meets the needs of the present without compromising the ability of the future to meet their own” (Castle, et al., 1996). It involves finding ways to balance economic, social and environmental considerations in order to create a better world. Circular economy, on the other hand, is an economic model that aims to minimize waste and maximize the use of resources (European Parliament, 2022). It involves creating a close-loop system where materials are used, reused and recycled in order to reduce the amount of waste that is generated. This not only helps to conserve natural resources, but also reduces greenhouse gas emissions and other negative environmental impacts. Together, sustainability and circular economy have the potential to create a more sustainable future for all. By promoting sustainable practices and reducing waste, we can work towards a world that is more equitable, prosperous and environmentally conscious.

The circular economy is gaining increasing attention worldwide, as more and more countries strive to achieve sustainable economic growth while reducing their environmental impact. One of the most significant sectors contributing to waste and greenhouse gas emissions is the food and drinks industry. Romania, as a member state of the European Union, has committed to promoting sustainable development and reducing its carbon footprint.

This article provides an overview of Romania's circular economy strategy in the food and drinks sector. It is especially important to study this sector since the food and beverage industry produces vast amounts of waste and by adopting circular economy principles, businesses in this sector can minimize their waste and carbon footprint by reducing their environmental impact. Through this overview, we aim to highlight the importance of adopting circular economy principles in the food and drinks sector in Romania and to inspire further discussion and action towards a more sustainable future.

### **Research methodology**

In this article I decided to analyse the way in which Romania aligns with the circular economy principles in the food and drinks sector and I analysed the Government Decision no. 1172/2022 for the National Strategy regarding circular economy to observe what are the problems and possible solutions regarding the sector mentioned. The first stage of my research regards the theoretical research. In this stage I studied articles, specialized books and other materials regarding the circular economy phenomenon. The second stage consists of the analysis of the official document mentioned, the Government Decision no. 1172/2022.

The scope of my research is to observe if Romania recognizes the problems regarding circular economy in the food and drinks sector and what action it takes to minimize the problems. Therefore, I came up with the following research objectives:

*O1: To identify the main problems regarding circular economy in Romania in the food and drinks sector*

*O2: To identify the solutions to the problems identified in the food and drinks sector in Romania regarding circular economy.*

The research method used in this article is the document analysis (or content analysis), this research method being suitable for the analysis of "books, blogs, official papers and reports" (Leavy, 2017). It is important to highlight the fact that my research is a qualitative one, the main scope being to discover the real state of the phenomenon from official documents.

### **Circular economy- definitions**

The first step in understanding the concept of circular economy is understanding the definitions given in the literature and in the present section I am going to mention some of the most important definitions given to this concept, this selection not being exhaustive. An author (Gosh, 2020) described circular economy as being "a systems-level approach to economic development and a paradigm shift from the traditional concept of linear economy model of extract-produce-consume-dispose- deplete (epcd<sup>2</sup>) to an elevated echelon of achieving zero waste by resource conservation through changed concept of design of production processes and materials selection for higher life cycle, conservation of all kinds of resources, material and/or energy recovery all through the processes, and at the end of the life cycle for a specific use of the product will be still fit to be utilised as the input materials to a new production process in the value chain with a close loop materials cycles

that improves resource efficiency, resource productivity, benefit businesses and the society, creates employment opportunities and provides environmental sustainability”.

The European Environment Agency says about circular economy that “It provides opportunities to create well-being, growth, and jobs, while reducing environmental pressures. The concept can, in principle, be applied to all kinds of natural resources, including biotic and abiotic materials, water, and land” (European Environment Agency, 2016).

Another author (Mitchell, 2015) considers that “a circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extracting the maximum value from them while in use, then recovering and reusing products and materials”. The European Commission states that the circular economy is an economy where “the value of products, materials, and resources is maintained in the economy for as long as possible, and the generation of waste minimized” and the transition to a circular economy is “an essential contribution to the EU’s efforts to develop a sustainable, low-carbon, resource-efficient, and competitive economy” (European Commission, 2015).

### **Circularity and the “R principles”**

Circularity is defined as a “performance that indicates to what extent raw materials, parts and final products are restored or regenerated into technical or biological flows” (Vlajic, Cunningham, Hsiao, Smyth, & Walker, 2021). But the problem and the question that arises is how can we achieve circularity? In the literature it is said that circularity can be achieved by “creating a closed-loop supply chain, where reverse flows cycle back in the system, to the organisations where they started” (Vlajic, Mijailovic, & Bogdanova, Creating loops with value recovery: empirical study of fresh food supply chains, 2018) or by “open-loop supply chains, where reverse flows cycle and cascade to alternative supply chains in the same sector” (Weetman, 2017). In the literature I identified different R principles frameworks: the 4R principles framework (European Parliament and the Council, 2008), the 5R principles framework (Doppelt, 2010) and many others, but in this section I am going to focus on 8 principles that contribute to a sustainable development and to the development of circular economy.

*The first R. Rethink:* To rethink means a lot of things and it includes a lot of different actions such as “reconceptualization of ideas, processes, constitutive elements of Circular Economy and other R principles” (Morseletto, 2020). For circular economy to be effective and to really exist, it is important to rethink the production system and also the consumption system. In order to rethink the production, it is demanded to develop new and modern business models (Ludeke-Freund, Gold, & Bocken, 2019), new recycling and reprocessing systems and even new and innovative products (Pagell, Wu, & Murthy, 2007).

*The second R. Redesign:* When we think about redesign the first thing that comes into our minds is change, innovation, improvement even. To redesign means to improve or change for the better the design of products, processes or services in order to “enable input from recycled materials, extend the useful life of products and enable easy recovery of products, components and materials and their return to biological and technical cycles” (Doppelt, 2010). To redesign meant to come closer to sustainability, to improve the economy while

reducing the environmental impact and taking into consideration the social impact of a company.

*The third R. Reduce:* In order to apply the “reduce” principle, a lot of things must be taken into account such as “strategies that aim to reduce inefficient use of resources in the pre-manufacturing phase, inefficient use of energy and the use of virgin materials in manufacturing, generation of toxic by-products in manufacturing and post-manufacturing phase” (Vlajic, Cunningham, Hsiao, Smyth, & Walker, 2021). To optimise the use of resources and to help reduce the use of natural resources, in the literature was suggested to use new technologies like “The Internet of Things, Block-chain and robotisation” (Ivanov, 2020).

*The fourth R. Replace:* It is obvious that this principle aims to replace the existing strategies, technologies, materials and others with more sustainable ones in order to achieve a higher degree of sustainability. Nowadays, there is a global tendency to replace wood and construction materials with more sustainable ones like bamboo for example, and even in the food industry it is tried to replace the meat with more sustainable plant-based alternatives and to replace the packaging with ones made out of recycled materials. Another aspect that needs replacing and it is a global trend to try to make a change is in the renewable energy sector where “energy sources based on the use of sun, wind, waves and residual heat from industry” (Bauwens, Hekkert, & Kirchherr, 2020) is being used.

*The fifth R. Reuse:* The “reuse” principle is understood in different ways in the literature, but it basically means “the recovery of products and components that result from commercial returns, lease returns, warranty returns or returns due to overstocking” (Vlajic, Mijailovic, & Bogdanova, 2018). Some of the main activities linked to “reuse” are “re-labelling, repacking, repairing or refurbishing” (Vlajic, Cunningham, Hsiao, Smyth, & Walker, 2021) and “resale or donations of second-hand or surplus products” (Weetman, 2017).

*The sixth R. Repurpose:* To repurpose means to use something for another function, and the application of this principle is considered difficult and challenging: “while many parts can be repurposed in a variety of products, not many products can be easily repurposed; moreover, the scale of an operation is small and traceability of parts and products can be lost” (Morsetto, 2020).

*The seventh R. Recycle:* The recycling refers to “a recovery of materials that do not retain the functionality of used parts or products” (Vlajic, Cunningham, Hsiao, Smyth, & Walker, 2021). The recycling strategy is a challenging one especially because it is based on the organised collection of the waste, this being especially important and also difficult to achieve.

*The eighth R. Recovery:* The recovery of other resources takes into account the natural renewable sources that are being used both in production and consumption such as energy, water, soil and so on.

### **National Strategy regarding the circular economy- food and drinks sector**

In Romania, the adoption of circular economy practices has been slow, but in recent years there has been increasing interest and efforts to promote and implement the principles of circular economy in various sectors of economy. One key challenge facing Romania in the implementation of circular economy is the lack of awareness and understanding among the

general public and many businesses about the benefits of the circular economy and how it can be applied in practice. Thus, our hope is that, by adopting the most recent Government Decision, some of the problems are going to be solved.

In September 2022, in Romania was adopted the Government Decision no. 1172/2022 for the National Strategy regarding circular economy. This strategy will be complemented by an Action Plan which will include specific actions for sectors with high circularity potential.

The Strategy has some main directions of action which I am going to briefly mention. First, the aim is to reduce the consumption of raw materials through more sustainable extractions of raw materials and through recycling and recovery activities. Secondly, to reduce the consumption of consumer goods by extending the life of products, applying a circular design and material efficiency. Thirdly, to reduce the environmental impact of production activities by applying more innovative and environmentally friendly technologies and processes, by promoting digitalisation and by favoring renewable energy. Fourthly, it is intended to reduce the environmental impact of wastewater management and disposal activities by promoting waste prevention, promoting the waste sorting activities. Finally, to improve the policy coherence and governance, communication and collaboration between local, regional and national authorities.

In the following section, I am going to present the main findings from the Government Decision no. 1172/2022 regarding the food, drinks and tobacco sector, as part of consumption goods.

*General overview:* The food, beverages and tobacco sector is the largest production sector in Romania, in 2020 Romania produced 24% of the mentioned products (Guvernul României, 2022), the sector accounting for 5% of the GDP. The most important thing is that, according to the Strategy, over 4.5 million Romanians struggle purchasing daily food, but the food waste is 2.55 million tons every year. Of course some of the most important actions that could be taken in this situation to achieve circularity is the reduction of food waste, alongside eco-labelling, eco-packaging and composting food-waste to achieve recovery.

*Problems identified:* The biggest problem related to the transition from the linear economy to a circular economy consist of low recycling rates, Romania having among the lowest recycling rates in Europe for plastic, paper or glass. Another important problem is the one of food waste, the generation being very high, while the separate collection of waste remains very low. According to the 2019 BIOREGIO report (Guvernul României, 2022), “the annual amount of food waste in Romania corresponds to 129 kg per capita, while the amount of food waste in France is only 29 kg per capita”, while food waste corresponds to 67% of the municipal biological waste. The subsequent problem is that in 2020, only 18 kg of biological waste per capita was recycled, while the EU average is 90 kg per capita. It is known that recycling and sorting technologies exist in Romania, but they are not really being used because the education regarding the environment is lacking. Even though some environmental-related subjects have been in school for a while, they were optional and not many students attended, and only recently through the Government Ordinance no. 6/2021 „the central authority in the filed of education, through decentralized public services, carries out information activities on the prevention of waste generation in general and the

prevention and reduction of the impact of single-use plastic products” (Guvernul României, 2022). I personally found really concerning that in 2019, the Romanians consumed 106 liters of bottled water per capita. In comparison, in Sweden, Finland and Denmark, the consumption of bottled water is less than 20 liters per capita.

*Possible solutions:* The possible solutions are divided in stages. In the stage of production and distribution, the Strategy suggests that the most important action to take is the replacement of packaging and switching to the use of recycled materials. In order to achieve this, it could be introduced the mandatory eco-design for packaging and eco-labelling of products. In the consumption phase, the most important issue to be dealt with is the food waste prevention and possible solutions are encouraging food donations and promoting this strategy through education. In order to encourage food donations, the Strategy suggests “tax credits and deductions and remodelling waste taxes to make donations more economically advantageous than disposal”. Moreover, the prohibition of the use of certain single-use plastic items is important and increases circularity in the food value chain. At the same time, the revised drinking water Directive of 2021 needs to be incorporated in the Romanian legislation which “provides measures to promote the consumption of tap water, such as the free supply of water in public administrations and public buildings, or free of charge or for a reduced service fee for customers in restaurants, canteens and catering services” (Guvernul României, 2022). Regarding the use of single-use packaging in food and drink consumption, the Governance Ordinance no. 6/2021 on reducing the impact of certain plastic products on the environment is already initiated. In addition to this, it is important for Romania to improve the infrastructure for separate collection, especially by engaging the citizens to take part in this action. A possible solution suggested in the Strategy is “to promote and develop an infrastructure dedicated to composting at home or jointly”. Moreover, it is important to introduce awareness and education programs on waste management which can be prepared at national level through partnerships such as with NGOs and also with the private sector.

## **Conclusions**

The circular economy is an economic system with the aim of reducing waste and promoting sustainability by minimizing the consumption of natural resources and maximizing the use of renewable resources. The food and drinks sector is one of the most significant contributors to waste and greenhouse gas emissions globally, and Romania is taking small steps to having a more circular economy. In this article I highlighted some of the main problems Romania is facing at the moment regarding circular economy in the food, drinks and tobacco sector and some solutions which could be applied. The most important area where actions must be taken is reducing food waste. In this sector, Romania could introduce more policies and initiatives that encourage consumers to reduce food waste by buying only what they need, and businesses to donate unsold food to charities. Another area where action must be taken is promoting the use of recyclable and recycled packaging. Nevertheless, it is extremely important to encourage the use of renewable energy because the food and beverage industry is a significant energy consumer and using renewable energy sources can reduce its environmental impact by using energy sources such as solar, wind and hydropower. Even though there are challenges to implementing a circular

economy in the food and drinks sector, such as changing consumer behaviour and investing in new technologies, the benefits far outweigh the costs. As such, it is essential for businesses and policymakers in Romania to prioritize the circular economy and to work towards a more sustainable future.

In conclusion, this article provides an overview of Romania's circular economy strategy in the food, drinks and tobacco sector and highlights the importance of adopting circular economy principles to promote sustainable economic growth while reducing environmental impact.

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