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ESSENTIAL ASPECTS OF TRANSITION TO A CIRCULAR ECONOMY FROM WASTE MANAGEMENT PERSPECTIVE

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Abstract:
Waste is one of the main pollutants of all vital elements of the environment both globally and locally. Thus, waste management is the foundation of long-term policies aimed at sustainable development, with a focus on reducing the volume of waste produced, recycling, reusing and disposing of it in an efficient and least polluting way. Waste management is a first step in the transition to a circular economy as this objective is included in the program implemented by the European Union in 2017. Also, achieving the global recycling target of 50% of waste generated aims to increase the level of recycling among population, the use of recycled materials and energy production. The main objective of this paper is underlined by the idea of outlining the role of waste in the context of the circular economy and to make the transition to a circular economy, given both the threats and the opportunities specific to this path. In this sense, the study aims first of all to identify the way in which waste has a beneficial global contribution, and secondly it aims to capitalize on the concept of circular economy and develop the main steps needed to substantiate that concept.

Key words: circular economy, pollution, recycling, sustainable development, waste management.

JEL classification: O11, O44, Q53, Q57.

1. INTRODUCTION

The emergence of the consumer society at the end of the twentieth century, as well as the trend of population growth have contributed to the considerable increase in the volume of waste and so today, they are a topic increasingly analyzed and discussed in all corners of the world. Highlighting the idea that every day the economic activities undertaken by economic entities undergo changes, we can highlight the fact that production and consumption increase rapidly which leads to an accelerated increase in the amount of waste resulting from various ways. In this sense the importance of acknowledging the long-term effects of education towards the sustainability principles has been already noticed and furthermore implementation of sustainable development includes also strategies of educational programs (Bejinaru et al., 2018).

In addition, the scarcity of natural resources is becoming increasingly apparent. At the same time, we must not neglect the fact that humans must live in harmony with nature. This is necessary because today we are witnessing ecological imbalances caused by the excessive use of resources as a result of the permanent desire to make the most significant profits. Thus, all these phenomena have led to the need to find solutions to protect the environment, to use resources efficiently, but also to ensure sustainable development and to identify other ways of approaching production and consumption systems (Guldman, 2016; Steliac & Steliac, 2019).

2. DEFINING KEY CONCEPTS

Improper waste management poses significant risks to public health and can lead to additional costs in the short and long term. Therefore, it is necessary for the organizations to give significant importance to waste management in order to improve the flow of materials taking into account economic, environmental and technical factors. Waste management is a priority environmental issue as waste is one of the main sources of environmental pollution (water, air, soil) (Cautisanu et al., 2018).

As a result of the increase in the volume of waste, an ingenious, efficient and even profit-generating solution, called recycling, has emerged. The launch of a cost-effective waste management through recycling and selective collection leads to the achievement of objectives such as: reducing waste stored in landfills, as a consequence reducing the effects on the environment, but also saving raw materials (Ghinea & Gavrilescu, 2019). The implementation of efficient and sustainable recycling programs is dependent on determining the factors that influence the level of recycling. This goal is pursued by both government institutions and companies, as illustrated in figure no 1. To this end, the European Union aims to meet a global recycling target of at least 55% of municipal waste by 2025, then 60% by 2030 and 65% by 2035. Given its favorable impact on the environment, as well as its economic and social value, "recycling is a key factor in achieving a circular economy and sustainable development" (Pelau & Chinie, p. 343).

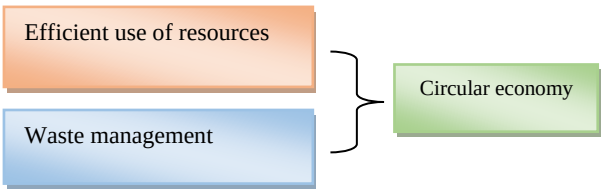

Figure no. 1 Circular economy
Source: adaptation after Tartiu et al, 2016

3. THE IMPORTANCE OF THE CIRCULAR ECONOMY

Undoubtedly, global population growth has produced huge amounts of waste. According to data provided by the United Nations, in 2030 the natural resources needed are expected to be half as low as in 2010, even if the global population will increase. Resources are becoming increasingly limited, clean water is shrinking, as is clean air (EC, 2020a).

From this perspective, the transition to a circular economy is becoming increasingly relevant, both in terms of environmental conservation and the establishment of the principles of a "green" economy, and in terms of consumer satisfaction through technological upgrades (Krasulja et al., 2020).

Waste is currently a priority in the European Union as well as in many countries around the world. It is all the more important as there is a special emphasis on changing the current economic model with a sustainable one, that of the circular economy. The circular economy is the pattern of production and consumption that consists of distributing, reusing, restoring and recycling current products for as long as possible. Its purpose is to ensure that existing products have a long-life cycle, and that the motto of the circular economy is to minimize waste (Steliac, 2020).

The concept of circular economy is defined as "a regenerative system in which the input of resources, waste, emissions and energy losses are minimized by slowing down, closing and narrowing the loops of materials and energy" (Geissdoerfer et al., 2017). In addition, this notion is outlined from the perspective of the European Commission, which states that the circular economy is closely correlated with its basic principles and priorities, proposing a project to reduce the amount of waste collected in landfills and to mobilize the company to reuse and recycling of major waste groups (Abdel-Shafy & Mansour, 2018).

Currently, the idea is maintained that an efficient and viable economic and social development is the result of proper management of waste, raw materials, energy, etc., thus providing the opportunity to maintain limited natural resources and protect the natural environment in which we live.

The transition to a circular economy enjoys the significant attention of public authorities and research institutes as it aims to keep resources and products in the economy as long as possible and, last but not least, to reduce the volume of waste. In addition, the literature (Kirchherr et al., 2017) outline this concept around key notions such as:

• the structure of the 4Rs (*Reduce, Reuse, Recycle, Recover*);
• viable development;
• systemic approach;
• waste hierarchy.

The transition to a circular economy is closely linked to the reassessment of unsustainable consumption and production patterns in order to recognize future development opportunities. In this regard, the introduction of the 2030 Agenda, which aims at sustainable development, emphasizes the importance of integrated support for economic, environmental and social elements (Nastase et al., 2020). The goal of disconnecting economic development from the use of natural resources is a significant process in the succession of efforts to support eco-efficient economies, with a strong emphasis on profitable consumption of natural resources. Thus, the circular economy aims to reduce the consumption of basic sources in the production process by reusing products, as well as by increasing the volume of recycled and reused materials (Cimpan et al., 2015).

Viewed as a component of sustainable development, the notion of circular economy highlights the idea of improving resource consumption in order to avoid, minimize waste and encourage reuse. Circularity, namely the idea of closing the economic loop, is closely linked to the creation of new jobs, increased resource saving, economic competition and avoidance of waste (Babbitt et al., 2018; Nastase & Muscal, 2021). Within the circular economy, there is progress based on the idea that "today's goods are tomorrow's resources at yesterday's prices" (Petcu et al., 2012). Consequently, the objective of launching waste reduction strategies by increasing the life of products through reuse, recovery, technological upgrading is actively supported.

The future opportunities for the development of the circular economy are directly related to the protection of the environment, but also to the increase of competition and technological modernization. Thus, over time, there have been debates about the role of the circular economy, all materialized through a bold project implemented by the European Commission. Thus, in 2015, at the level of the European Union, the European Commission highlighted a plan that aims to protect the environment. This legislative framework aims to replace the so-called "linear" economy (the good is consumed and then discarded) with a system in which the emphasis is on reusing the resources made available. The model of linearity tends to be characteristic of that period in which it was still much to be explored and exploited "first hand": it overlaps with the period that culminated in the era of geographical discoveries which completed the mapping of world riches, extended by technological inventiveness which widened the possibilities of capitalizing on them (Jora et al., 2018).

The introduction of the circular economy mini-package had as its main interest the situation of plastics. The plastics strategy aims to change the way products are designed, made, used and recycled in the European Union. A major focus is also on long-term waste management objectives, with priority given to prevention, reuse, training for reuse and recycling, taking into account the waste hierarchy (prevention, reuse, recycling, energy recovery and disposal) (EC, 2020b).

4. THE TRANSITION TO AN EFFICIENT CIRCULAR ECONOMY

An effective first step towards a circular economy is highlighted by expanding global commitments and resolutions to reduce the amount of plastic in the seas and oceans in order to make waste control more profitable and take action against the effects of climate change. Moreover, the notion of circularity is correlated with the efficiency of the consumption of natural resources at system level, but also with the transformation of waste into new opportunities for industries (Wang et al., 2019). The transition to the circular economy comes with challenges that highlight the need for a political commitment and the development of resource efficiency standards on each waste stream or other resource, the financing of innovation and research in the development of new technologies but also to promote information technology initiatives (Tartiu et. al., 2019).

Another step for the circular economy to function in ideal standards is shaped by the exploitation of secondary products and resources. To this end, the expansion of the new market

plays an important role in the practical introduction of resource efficiency. Given this perspective, an active contribution to improving the use of resources at the level of economic activities is attributed to the digital platforms for the marketing of by-products (Araujo-Galvao et al., 2018; Prelipcean & Bejinaru, 2019).

With the implementation of the principles of circular economy, the life cycle of products must be analyzed step by step from the moment of their conception to the waste stage. A concrete example could be plastics, which need to be rethought at a technical level as the aim is to minimize the negative impact on the environment. This category plays a key role in society. Thus, in order to make the transition to the circular economy, the establishment of some main directions of action is highlighted:

• extending a profitable economy of plastic after its use;

• reduction of pollution with marine waste by companies in the field of plastics industry;

• the need to disconnect the production of plastics from the use of fossil fuels through various methods of analysis and innovation to discover the renewable resources of raw materials.

Marine waste pollution causes problems in various fields such as tourism, navigation or fish farming. Therefore, this mobilization is directed directly at those disposable products that are collected and recycled. Thus, at European level, precise measures have been taken such as banning thin plastic bags (in Romania from January 1, 2019), encouraging the use of biodegradable products, but also notifying the population about the negative effects of plastic on the environment. The adoption of the European Union's plastics strategy also marked a further step towards a circular economy as the aim is to minimize marine plastic waste belonging to various disposable plastic goods as well as plastic fishing gear (EC, 2020a; EC, 2020b).

It is essential to specify that this waste group is a wasted resource at the level of economic activity, directly generating a negative influence on the environment. The development and modernization of technologies conducive to efficient waste management is a necessity that needs to be addressed when it comes to financing. Therefore, "this emerging area of the circular economy is an opportunity for SMEs to develop sustainable business models" (Tartiu et. al., 2019). Last but not least, the increase in the level of information among consumers on the market promotion of new waste products is highlighted by a significant importance in capitalizing on viable business models (Bratianu et al., 2020; Ferasso et al., 2020).

5. GOOD PRACTICES ON WASTE RECYCLING

Recycling and sustainable development projects must take into account "markets for recoverable materials, collection infrastructure and overhead costs" (Plesea & Visan, 2010, p.203). In most cases, the exploitable materials are in the form of a lower quality compared to the incipient materials, in this sense the price brought on the market must attract the attention of potential buyers. Based on the idea of producer responsibility, the main funding for collection and recycling operations must come from producers. As the recycling process is based on objectives such as maintaining natural resources, protecting the environment and improving the quality of life, it must receive economic support from the state (Neamtu et al., 2019; Urbinati, Chiaroni, & Chiesa, 2017).

In some areas, selective waste collection is carried out by both the population and businesses. An objective aimed at this endeavor is to educate the population. Discounts will be reimbursed for those who actively participate in the selective collection of waste, and those who do not comply with the rules will receive penalties. Therefore, the circular economy pursues a prospect of improving the use of resources by discovering favorable practices for the conservation, reuse and recycling of ancillary products. In this regard, viable manufacturing models are being encouraged, which are actively participating in increasing the number of green jobs. In addition, promoting the opportunities of the circular economy contributes to supporting efforts to minimize GHG (Green-House Gas) emissions by introducing eco-efficient procedures and technologies (Arena et al., 2021).

The steps towards the circular economy must be known in detail by all consumers, and not

only because of their social, environmental and economic significance. Promoting the circular economy aims to raise awareness of the need for moderate use of resources in the national and global economy (Nastase & Muscal, 2020).

6. CONCLUSIONS

Conservation and management of natural resources are issues that have become increasingly difficult to achieve today. Thus, it is essential for every consumer to use resources in a profitable way, to know how much to recover and how much they are allowed to lose from them. In this formula, the circular economy emerges, which aims to identify an efficient consumption of resources.

The circular economy sector encompasses all areas of activity, not just waste management, as resource efficiency is an issue that correlates with the ability to deliver cost savings and introduce new technologies that optimize economic processes.

The negative effects of waste on the environment have attracted attention in recent years both globally and nationally, with the focus on marine litter issues. At European level, the overarching goal is to find sustainable solutions to improve the consumption of resources to close the economic loops.

Waste management is an essential component of the circular economy, but it outlines the need for more in-depth research into the value chain of products, starting with obtaining materials, then following the ecological shaping phase and ending with the final product, which will later become a new profitable resource for another company. From this perspective, we can say that the circular economy does not stop only at the level of waste, but it puts in the foreground the closure of consumption loops.

In addition, the development of new sustainable business plans by encouraging the profitable use of resources is the central pillar of a circular economy. In order to accomplish that on the long-run, decision makers should think strategically and be able to design emergent strategies in the spirit of the circular economy paradigm (Bratianu & Bejinaru, 2020; Rizos et al., 2016).

In conclusion, the circular economy continues to be a fundamental interest of mankind given the limited nature of material resources. The concept of circular economy can be outlined and developed in a sustainable environment, characterized by assistance, reuse, repair and recycling. At the same time, the idea of transitioning to a circular economy is of great importance to governments as well.

REFERENCES

1. Abdel-Shafy, H.I., Mansour, M.S.M. (2018). Solid waste issue: sources, composition, disposal, recycling, and valorization Egypt. J. Petrol., 27, pp. 1275-1290, 10.1016/j.ejpe.2018.07.003
2. Araujo-Galvao, G.D., de Nadae, J., Clemente, D.H., Chinen, G., Monteiro de Carvalho, M. (2018). Circular economy: overview of barriers Procedia CIRP, 73, 79-85, 10.1016/j.procir.2018.04.011
3. Arena, M., Azzone, G., Grecchi, M., Piantoni, G., (2021). How can the waste management sector contribute to overcoming barriers to the circular economy?. Sustainable Development.. doi:10.1002/sd.2202
4. Babbitt, C. W., Gaustad, G., Fisher, A., Chen, W. Q., & Liu, G. (2018). Closing the loop on circular economy research: From theory to practice and back again. Resources, Conservation and Recycling, 135, 1– 2.
5. Bratianu, C., Prelipcean, G., Bejinaru, R. (2020). Exploring the latent variables which support SMEs to become learning organizations, Management & Marketing 15 (2), 154-171.

6. Bratianu, C., Bejinaru, R. (2020). COVID-19 induced emergent knowledge strategies. Knowledge and Process Management, 10.1002/kpm.1656.
7. Bejinaru, R., Hapenciuc, C. V., Condratov, I., Stanciu, P. (2018). The university role in developing the human capital for a sustainable bioeconomy. Amfiteatru Economic, 20(49), pp. 583-598. DOI: 10.24818/EA/2018/49/583
8. Cautisanu, C., Asandului, L., Borza, M., Turturean, C., (2018). Quantitative Approach to Circular Economy in the OECD Countries. Amfiteatru Economic, nr. 48/2018, pp. 262-277.
9. Cimpan, C., Rothmann, M., Hamelin, L., Wenzel, H. (2015). Towards increased recycling of household waste: Documenting cascading effects and material efficiency of commingled recyclables and biowaste collection. J. Environ. Manag., 157, pp. 69-83.
10. European Commission, (2020a). Waste: construction and demolition waste [WWW document]. URL http://ec.europa.eu/environment/waste/construction_demolition.htm (accessed 3.1.20).
11. European Commission, (2020b). A new circular economy action plan: for a cleaner and more competitive Europe [WWW document]. URLhttps://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN.
12. Ferasso, M, Beliaeva, T, Kraus, S, Clauss, T, Ribeiro-Soriano, D. (2020). Circular economy business models: The state of research and avenues ahead. Bus Strat Env. 29: 3006– 3024. https://doi.org/10.1002/bse.2554
13. Geissdoerfer, M., Savaget, P., Bocken, N.M.P., Hultink, E.J., (2017). The circular economy–a new sustainability paradigm? Journal of Cleaner Production, 143(1), pp.757-768.
14. Ghinea, C., & Gavrilescu, M. (2019). Solid waste management for circular economy: Challenges and opportunities in Romania–The case study of Iasi County. In Towards zero waste (pp. 25– 60). Cham, Switzerland: Springer.
15. Guldmann E. (2016). Best Practice Examples of Circular Business Models, University of Aalborg, Published by: The Danish Environmental Protection Agency Strandgade 29, pp. 8- 9, http://www2.mst.dk/Udgiv/publications/2016/06/978-87-93435-86-5.pdf
16. Jora, O.D., Pătruți, A., Iacob, M., (2018). The Vicious Circles of Bureaucratic Circular Economy: The Case of Packaging Waste Euro-Targets for Romania. Amfiteatru Economic, 20(48), pp. 478-497.
17. Kirchherr et al. (2017). Conceptualizing the circular economy: An analysis of 114 definitions,Resources, Conservation & Recycling , pp. 221–232.
18. Krasulja N., Ilic D., Markovic B., (2020). Basic principles of circular economy with special focus on sustenable consumption „Y" and „Z" generation, Ecoforum, Vol.9, Issue 2(22).
19. Nastase, C., Muscal, D. (2021). New approaches to value creation in the tourism sector-the circular economy. Studia Universitatis Babes-Bolyai, Negotia, 66(3), 19-32.
20. Neamtu, D., Hapenciuc, V., Bejinaru, R. (2019). The impact of digitalization on business sector development in the knowledge economy, Proceedings of the International Conference on Business Excellence, Bucharest, Romania, 13(1), pp. 479-491.
21. Pelau, C., Chinie, A.C., (2018). Econometric Model for Measuring the Impact of the Education Level of the Population on the Recycling Rate in a Circular Economy. Amfiteatru Economic, 20(48), pp. 340-355.
22. Petcu, M., Miron, D., Sobolevschi, I., (2012). Determinism in evaluarea comportamentului ecologic al consumatorului, Revista Amfiteatrul Economic, nr. 31/2012, pp. 109-121.
23. Plesea D., A., Vișan S., (2010). Bune practici privind managementul reciclării deșeurilor solide, Amfiteatru economic, Vol.XII, nr.27, p.202.

24. Prelipcean, G., Bejinaru, R. (2019). Strategies of leadership success in the knowledge economy, 7th International Academic Conference on Strategica - Upscaling Digital Transformation in Business and Economics, Bucharest, Romania, pp. 453-460.
25. Rizos, V.; Behrens, A.; Van der Gaast, W.; Hofman, E.; Ioannou, A.; Kafyeke, T.; Flamos, A.; Rinaldi, R.; Papadelis, S.; Hirschnitz-Garbers, M.; Topi, C. (2016). Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers. Sustainability, 8, 1212. https://doi.org/10.3390/su8111212
26. Steliac N., (2020). Waste in the circular economy: Romania in the EU context, The USV Annals of Economics and Public Administration, Vol. 20.
27. Nastase, C., Chașovschi, C.E., Scutariu, A.L. (2020). Municipal waste management in Romania in the context of the EU. A stakeholders' perspective, Technological and Economic Development of Economy 25 (5), 850-876.
28. Steliac N., Steliac D., (2019). What is the progress of EU circular economies, Ecoforum, Volume 8, Issue 2 (19).
29. Urbinati, A., Chiaroni, D., & Chiesa, V. (2017). Towards a new taxonomy of circular economy business models. Journal of Cleaner Production, 168, 487– 498. https://doi.org/10.1016/j.jclepro.2017.09.047
30. Wang, J., Wu, H., Tam, V.W.Y., Zuo, J. (2019). Considering life-cycle environmental impacts and society's willingness for optimizing construction and demolition waste management fee: an empirical study of China. J. Clean. Prod., 10.1016/j.jclepro.2018.09.170
31. Tartiu V., Stefanescu M., Petrache, A., Gurau C., (2019). Tranziția către o economie circulară. De la managementul deșeurilor la o economie verde în România, Institutul European din România, Studii de Strategie şi Politici SPOS.