

## THE AWARENESS OF THE CIRCULAR ECONOMY PRINCIPLES IN MOLDOVA'S COMPANIES<sup>1</sup>

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### Abstract

*The circular economy is a new approach to the responsible and cyclical use of natural resources, where the economy should aim at minimizing the impact on the environment and stimulating the economy. Solving environmental issues in tandem with promoting sustainable growth has never been more current than it is today. One of the essential stages of the transition to a circular economy is the improvement of waste management, which is primarily due to limited global natural resources and the need to reduce their consumption. The Republic of Moldova, similar to other countries in the world, annually it produces huge amounts of waste, a significant share of which goes to companies and enterprises. In order to hold economic agents accountable in recent years, certain steps have been taken by public authorities, but they have remained without visible impact on the situation in the field. Because the adaptation of such a circular economy model is done at different levels, including at the level of individual, whether owner or employee of a company, we decided to conduct their survey in order to determine awareness of the principles of the circular economy of those who are involved in the real sector of the country's economy. The results of the interview clearly showed that the greatest efforts in the field of raising awareness, empowering companies are yet to be undertaken, and the transition to a circular economy in the Republic of Moldova will take some time.*

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**JEL Classification:** Q01, Q53, C99

### Introduction

The awareness of the need to build and promote an economic system without harmful emissions and waste of materials has practically come with the already widespread emergence of those devastating effects that the linear model of the economy has on the environmental and the quality of human life. Although, in the last two decades, many countries can boast of some progress in the field of environmental protection consumption and trade patterns still remain in contradiction with sustainable guidelines [Bendixen et al., 2021]. In order to actively participate in the protection, the conservation of the environment and at the same time increase the competitive advantage, companies have a number of different approaches in the field of environmental management and sustainable development [Suciu, 2015] but the most commonly used business model currently used by the real sector remains the characteristic of a linear economy, which operates on the principle of production, use, disposal [Ellen Macarthur Foundation, 2013]. A linear economy is characterized by mass depletion of resources, their use for the production of goods that at the end of their life cycle become waste.

Although much progress have been made in the area of resource efficiency, the overall advantage of this approach is lost due to a system that is based exclusively on consumption and not on reuse [Ellen MacArthur Foundation, 2013]. And this in the conditions in which there are already researches that demonstrate that the circular economy can contribute to a better productivity, ecological efficiency, and the renewal of the environmental management system and to the sustainable development objectives [Rodriguez-Anton, 2019]. The implementation of the principles of the circular economy has a positive impact on inclusive and sustainable economic growth, employment, industrialization and promotion of innovations, increasing the quality and safety of life in urban areas, conservation of natural resources through their sustainable use [Rodriguez-Anton, 2019]

We can overlook here the fact that the transition of companies to a circular economy model is driven not only by its known and demonstrated benefits and advantages but also by certain short-term constraints, references to which we find in well-established studies [Planing, 2014], such as the continuous rise in commodity

prices, technological development and the emergency of new business models, changing attitudes and behaviour of final consumers.

The problems and possibilities of transitioning to a circular economy model are currently being discussed very actively and if a few years ago most of the written work in the field came from Asia, now European researches are becoming more active, looking for and providing solutions for both companies. [Kerdlap et al., 2019; Benachio et al., 2020; Blomsma and Brennan, 2017; Suci, 2015] as well as for the authorities in the field [Fassio and Minotti, 2019; Geng & Doberstein, 2008; Avdiushchenko and Zajac, 2019]. However, in the context of this study we have increased interest in the economy of the Republic of Moldova, the purpose of the research being to analyse the current situation and determine the extent to which companies in the country and their employees are familiar with the concept of circular economy or circular economy model, if they know the main reasons for the need to make a transition and what would be the factors hindering this process.

### **1. The principles of the circular economy and their implementation**

The mechanism for implementing the principles of the circular economy is based on the 3Rs related to reduction, reuse and recycling. These are the basic actions without which one cannot imagine the implementation and achievement of the fundamental goals of the circular economy.

In turn, the implementation of the principles of the circular economy, as shown by the experience of one of the most advanced countries in this regard (China), must take place simultaneously at all three levels: micro, meso and macro. This conclusion is supported in the works and studies of several economists, who also classify the practices of the continuous circular economy in four areas: production, consumption, waste management and other support. Respectively, the complexity of the practices increases with the level of action, suggesting that the micro and meso levels are more vibrant compared to the macro level.

At the micro level, namely at the level of production companies and enterprises, the adaptation of the production, packaging and packaging process is encouraged taking into account a number of new requirements by using cleaner production methods in order to reduce emissions and increase efficiency and durability of products over time.

For example, a law to promote cleaner production was adopted in China in 2003, which addresses key issues related to pollution generation and resource efficiency at all stages of the production process. The implementation for enterprises with a high

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level of pollution, energy use and other negative outsourcing is compulsory. Such a law is indispensable to minimize consumption and waste, move to greener production by promoting durable products, the need to recycle waste and use them in other stages of the production cycle, as part of an integrated industrial ecosystem.

At the intermediate medium level, the circular economy practices include the development of eco-industrial parks and eco-agricultural systems. These need to be complemented by other measures, such as green design of industrial parks and proper waste management.

By applying the concept of industrial symbiosis, eco-industrial parks use common infrastructure and services. They allow groups of companies to cooperatively manage resource flows and by-products that reduce environmental outsourcing and reduce dependence on both companies and the nation's resources. In parallel with eco-industrial parks, this includes the ecological design of residential communities to create an ecological living environment. At this level, the same emphasis is placed on regulating and managing the urban consumption of energy, water and other natural resources to reduce their use, as well as the management and recycling of wastewater and solid waste in order to improve the quality of life and well-being of the population.

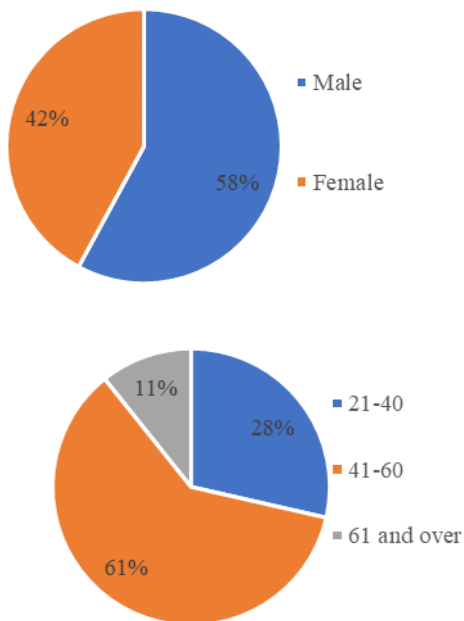
Finally, the practice of the global macro-circular economy requires the complex and extensive formation of a network of active cooperation and collaboration between industries and industrial parks including primary, secondary and tertiary sectors in production areas and in the residential sector. In the context of China, the macro level is addressed to large cities or regions/provinces.

The aims of the 3R principles can be achieved through the appropriate design and management of urban infrastructure and suburban and agricultural industrial production, as well as inventive public programs to phase out energy consumption and polluting technologies, replacing them with environmental friendly technologies and activities.

Regarding the area of consumption, the economists suggest the implementation of system based on renting and ``collaborative consumption``. This practice allows consumers to meet their needs rather through rental, systems based on the services offered by products and agreements. This system will reduce over-demand for resources and waste, and lower production capacity will be offset by the creation of a new range of services. An urban symbiosis as an extension of an industrial symbiosis that needs to be developed to take care of waste management by transferring waste materials for environmental and economic benefits from recycling and reuse.

The last area that includes administrative support includes the initiatives of governmental and non-governmental organizations covering all areas of production, consumption and waste management at all levels of aggregation. The regulations and initiatives of ministries or other administrative structures empowered to implement the principles of the circular economy at various levels must also be strengthened through the development of non-governmental and environmental organizations to change attitudes towards the environment in society. This is facilitated and supported by investments in education, providing information and active involvement of the public in raising awareness of the need to improve the quality of the environment. The healthier the environment, the better our well-being and health will be.

Summarizing the description of the circular economy model, we can conclude with the idea that the circular economy actually offers newly designed products, which are friendlier to changing production market.

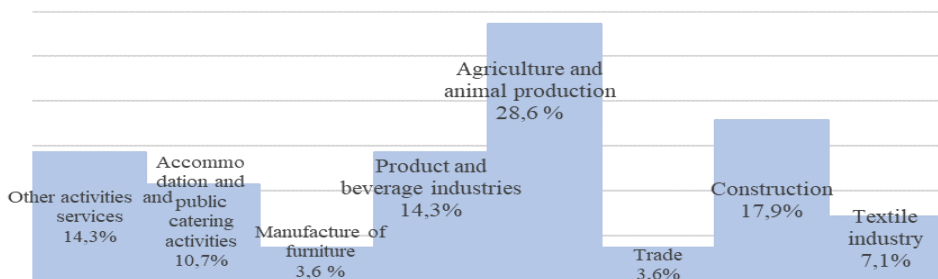


**Fig. 1. Gender and age composition of respondents**

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### 2. Methodology

The main objective of the study is to determine the awareness of Moldovan enterprises on the need to implement circular economy practices in its activity by determining the knowledge and skills of company employees about the circular economy and identifying circular economy practices that may already be implemented in companies. For this purpose, it was developed with a questionnaire that was random distributed online through various social networks and e-mail addresses of companies. The responses were received from 28 employees in various companies. Thus, 42% of women and 58% of men participated in the survey. Most, 61% of respondents belong to the 41-60 age group. 28% of respondents belong to the 21-40 age group. At least 11% in the age group of 61 years or more.



**Fig. 2. The type of activity of the companies in which the interviewees work**

The majority, up to 43% of respondents work in food production companies, 29% in companies whose activity is related to trade or services and 28% in various branches of industry. The structure of companies according to activity is presented in Figure 2.

About 42.9% of the respondents work in small enterprises with up to 10 employees, 32.1% of respondents came from small companies (with about 11-100 employees), 7.1% of medium-sized companies (with 101-205 employees). And 17.9% of respondents characterized the situation in large companies (they have 251 or more employees).

In addition to the basic demographic questions, the research also included questions related to the knowledge of the concept of circular economy. The questions were optional, some with multiple choice answers.

### 3. Research results

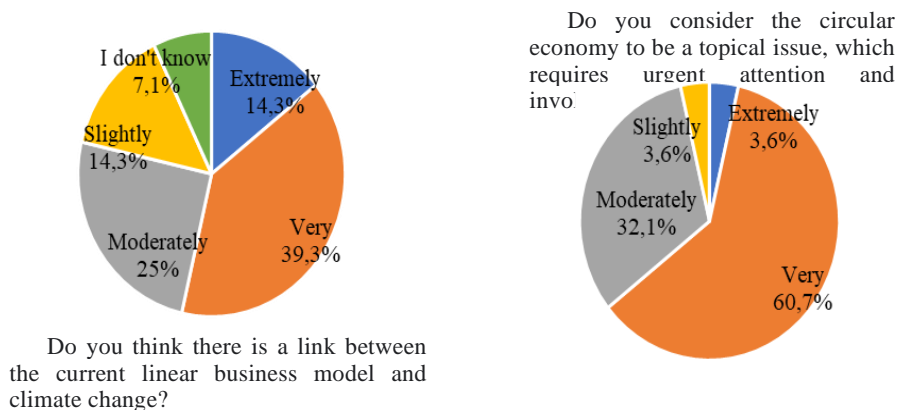
The main purpose of the research was to obtain a perspective image on the situation in the field of circular economy in the Republic of Moldova, by determining the degree of awareness of the principles of the circular economy. The questions to be answered in the survey were:

Q1: To what extent is the concept of circular economy known and if it is considered a topical issue, what requires urgent attention and involvement?

Q2: To what extent are the principles of the circular economy implemented in the companies in the country?

Q3: What barriers prevent companies from engaging in circular economy projects are important to more than half of respondents?

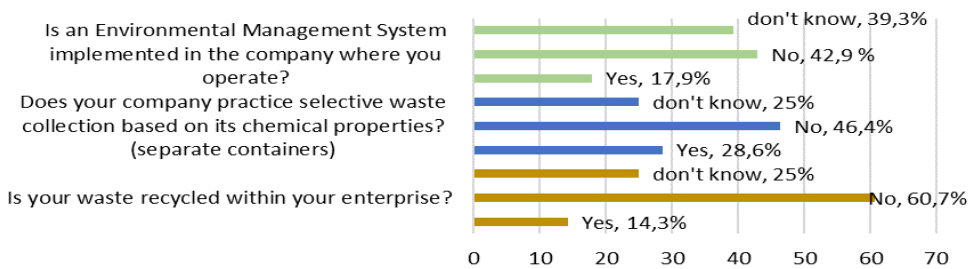
When they asked if they had heard about the term circular economy, the majority, 78.6% of respondents answered in the affirmative. When asked if there is a link between the current linear business model (which does not take into account the issue of waste and the recovery of the resulting by-products) and climate change, 39.3% answered that it exists to a large extent, 25% - to a moderate extent, 14.3% of respondents answered that to a small extent and to a very large extent. At the same time, when asked if an urgent involvement in the implementation of the circular economy is necessary, 60.7% of the respondents considered this issue very important and necessary. The distribution of the answers regarding the knowledge of the concept of circular economy is presented in Figure 3.



**Fig. 3. Answers to the questions related to the knowledge of the concept of circular economy**

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From the answers of the respondents we can deduce that not everyone who has heard about the concept of circular economy is well acquainted with its essence. At the same time, those who consider that there is a direct link between the current business model and climate issues are convinced of the need to speed up the implementation in practice of the principles of the circular economy. The results obtained are encouraging, as they show that more than half of the respondents are familiar with the concept of circular economy that requires attention and involvement.



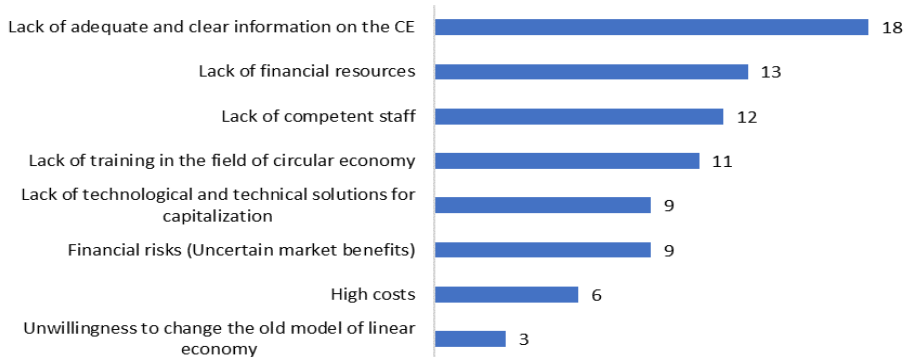
**Fig. 4. Implementation of actions needed for the transition to a circular economy in enterprises**

Whereas that knowledge is not equal to implementation, we set out to see the degree of implementation of the principles of the circular economy in practice. To this end, we aimed to see if the companies in which the respondents operate implement an environmental management system and whether selective waste collection and recycling are practiced – activities that are practically the basis for implementing the principles of the circular economy.

The answers to these questions give us the opportunity to conclude that measures on the implementation of the principles of the circular economy are practically not undertaken in the companies in the country. More than half of the employees are also unfamiliar with whether or not they are employed by the company in which they operate in this direction.

We also asked employees about the barriers that prevent companies from getting involved and reaping the benefits of the circular economy. The figure 5 shows the frequency of occurrence of each barrier.





**Fig. 5. Barriers that prevent companies from reaping the benefits of the circular economy**

Among the barriers that prevent companies from reaping the benefits of the circular economy, more than half of respondents chose the lack of adequate and clear information on the circular economy, the lack of financial resources and competent staff. We note, therefore, that knowledge of the principles of the circular economy is practically one of the essential barriers in the transition to a circular economy model, which is an effect of the lack of information and the lack of trained staff in the field.

92.9% of respondents to the question to what extent the state takes enough action on the transition to a circular economy answered that no action is taken at all (28.6%) and not enough action is taken (64.3%) and please identify the most important tool that could facilitate the transition to a circular economy regulations in the field of circular economy, the active intervention of the state has been selected as one of the main driving forces. After that, a practically identical major importance has the programs of education and awareness of the population and the tools of counselling and financing.

### Conclusion

The implementing sustainable practices is the only visible solution that would protect nature and the environment for future generations. The circular economy model can significantly contribute to the conservation of nature, natural resources and can offer certain economic benefits. The countries around the world are already actively implementing transition practices to the circular model, including

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in business, with increasing success and positive results. Respectively, Moldova should not lag behind in the process of transition to a circular economy either. We conducted this research to determine the current situation and established the starting points for promoting the circular economy model in Moldova.

The results showed that Moldovan companies are insufficiently aware of the importance of the circular economy model and, in general, do not know the model well. The companies attach considerable importance to state legislation and initiatives, which indicates that it would make sense to take certain measures at the state level. For the successful introduction of the circular economy model, it is not only necessary to prepare an individual company, but also the support of all stakeholders, including the state. After all, the state could also ensure that companies are better informed about the circular economy model, which has proven to be the most common obstacle to implementing the model.

The biggest limitation of the research presented is certainly the sample size. Due to the weak response of companies, and especially the high share of companies engaged in agriculture in their core business, we could assume that the survey results are biased and a larger sample would show even less awareness of companies and employees about awareness of the circular economy model. In the future, it would make sense to repeat the research and try to compare the results of the research with any of the other European countries.

## References

- [1] Avdiushchenko, A., Zajac, P., (2019) Circular economy indicators as a supporting tool for European regional development policies Sustainability, 11, p. 3025
- [2] Benachio G.L.F. et al., (2020) Circular economy in the construction industry: A systematic literature review, Journal of Cleaner Production, Volume 260, 121046, ISSN 0959-6526, <https://doi.org/10.1016/j.jclepro.2020.121046>.
- [3] Bendixen, M. et al (2021). Sand, gravel and UN sustainable development goals: conflicts, synergies and ways forward One Earth (Forthcoming), 4 (8), pp. 1095-1111
- [4] Blomsma, F., Brennan, G. (2017) The emergence of circular economy: A new framing around prolonging resource productivity Journal of Industrial Ecology, 21, pp. 603-614
- [5] Ellen MacArthur Foundation. (2013). Towards the Circular Economy: Opportunities for the consumer goods sector. Ellen MacArthur Foundation, 1–112. DOI:10.1162/108819806775545321
- [6] Fassio, F., Minotti, B. (2019) Circular Economy for Food Policy: The Case of the RePoPP Project in The City of Turin (Italy) Sustainability, p. 11

- [7] Geng, Y. and B. Doberstein (2008). Developing the circular economy in China: challenges and opportunities for achieving “leapfrog development”. *International Journal of Sustainable Development and World Ecology* 15(3), 231-239. <http://doi.org/10.3843/SusDev.15.3>
- [8] Geng, Y. et al. (2010). Energy analysis of an industrial park: the case of Dalian, China. *Science of the Total Environment* 408, 5273-5283.
- [9] Hicks, C. and R. Dietmar (2007). Improving cleaner production through the application of environmental management tool in China. *Journal of Cleaner Production* 15, 395-408.
- [10] Kerdlap, P. et al. (2019) Zero waste manufacturing: A framework and review of technology, research, and implementation barriers for enabling a circular economy transition in Singapore. *Resour. Conserv. Recycl.* 151, 104438
- [11] McDowall, W. et al. (2017) Circular economy policies in China and Europe *J. Ind. Ecol.*, 21 (2017), pp. 651-661
- [12] Planing, P. (2014). Business Model Innovation in a Circular Economy Reasons for Non Acceptance of Circular Business Models. *Open Journal of Business Model Innovation*, (April 2015), 1–11
- [13] Rodriguez-Anton et al. (2019) Analysis of the relations between circular economy and sustainable development goals, *International Journal of Sustainable Development & World Ecology*, 26:8, 708-720, DOI: 10.1080/13504509.2019.1666754
- [14] Stahel, W.R. (1986). The functional economy: Cultural and organizational change. In: *The Hidden Wealth. Science and Public Policy*, London, UK. Special issue, 13(4).
- [15] Su, B., A. Heshmati, Y. Geng and X. Yu (2013). A review of the circular economy in China: moving from rhetoric to implementation. *Journal of Cleaner Production* 42, 215-227.
- [16] Suci., R. (2015) Studiu privind managementul de mediu al companiilor din România în contextual dezvoltării durabile, *Revista Transilvană de Științe Administrative* 2 (37)/2015, pp. 197-214 <https://www.rtsa.ro/rtsa/index.php/rtsa/article/viewFile/518/515>
- [17] Zhu, D. and X.F. Huang (2005). Building up a model for circular economy based on object, main body, and policy. *Naikai Academic Journal* 4, 86-93.

