

# Influence of Closed-Loop Technologies on Local Development of Communities and Formation of Their Social and Economic Security

Olena Shebanina<sup>1,\*</sup>, Iurii Kormyshkin<sup>2</sup>, Valentyna Umanska<sup>3</sup>, Iryna Allakhverdiyeva<sup>4</sup> and Georgiy Reshetilov<sup>4</sup>

<sup>1</sup>Full Doctor in Economics, Dean of the Faculty of Management, Mykolayiv National Agrarian University, Mykolayiv, Ukraine.

<sup>2</sup>Full Doctor in Economics, Professor at the Department of Public Administration and Administration and International Economy, Mykolayiv National Agrarian University, Mykolayiv, Ukraine.

<sup>3</sup>PhD in Economics, Department of Public Administration and Administration and International Economy, Mykolayiv National Agrarian University, Mykolayiv, Ukraine.

<sup>4</sup>PhD Student, Department of Public Administration and Administration and International Economy, Mykolayiv National Agrarian University, Mykolayiv, Ukraine.

**Abstract.** Regional development in Ukraine is an important component of state policy. This is due to the fact that in the conditions of social and economic security, each community will be provided with security of the country as a whole. This study is topical in the role of community development for the modern economy of Ukraine. In the article describes how technologies of a closed-loop in the territory of regions help to achieve the highest level of social and economic security. The purpose of the work is to image this influence. The main method of writing the article was the analysis. In the article the author showed that the impact on the development of the region from the introduction of the concept of circular economy on its territory will be generally positive. This is justified by the reduction of dependence of the region on resource prices and other external factors, the reduction of the price of products in the long term, the lower pressure on ecology, creation of new jobs and some other advantages. However, the introduction of this concept of development can create some problems, especially at the initial stage. They are connected with financing of processing technologies, because of which local communities will need considerable support of the state. The article will be useful for studying ideas of sustainable development and helps other authors in writing their works; also, it can be useful for analysis of socio-economic situation in regions of Ukraine, etc.

**Keywords:** Sustainable Development; Regional Development; State Policy; Economy of Ukraine; Social and Economic Security.

**JEL Codes:** L38, L53, Q01

## 1. INTRODUCTION

Ensuring sustainable human development is recognized today as one of the most important problems facing the world community. Its essence is to satisfy simultaneously all kinds of needs of people (i.e., economic, social and ecological) without harm to future generations (Sharma, 2009). Some scientists believe that humanity is now at the crucial stage of its evolution on a planet that requires a shift toward this development paradigm, as it will enable the development and support of both human and the environment (Skutaru, 2013). Most countries are trying to implement the Paris Agreement in every way to achieve the goals of humanity for sustainable development (it is worth noting there is not unanimity among scientists regarding to effectiveness of this agreement) (Raiser et al., 2020). In addition, there is no consensus

among scientists on the concept of sustainable development: as a result of the complexity of this concept, complexity, importance and degree of influence on the development of society, many of its issues remain open and require further research (Haustova and Omarov, 2018).

The urgency of the concept of development has grown considerably, when threats to humanity from significant ecological problems created by the so-called "linear economy", the main one of which is the one-time use of resources (that is, without the possibility of their recycling), became especially noticeable. Recently, the concept of circular economy becomes more and more urgent, i.e., that provides for maximum efficiency from each process in the life cycle of goods or services and is characterized by maximum optimization of production process, repeated or joint use of already processed products or wastes (Aleksandrova, 2019). Thus, it leads to the economy of natural resources and to the reduction of emissions into the atmosphere, which is its economic effect.

\*Address correspondence to this author at Faculty of Management, Mykolayiv National Agrarian University, 54020, 9 Georgy Gongadze Str., Mykolayiv, Ukraine. E-mail: shebanina8921-2@nuos.pro

In general, the concept of the circular economy was introduced most effectively in large areas. However, it is possible and on a smaller scale, i.e., in separate regions or even within one business enterprise. Generally, the world experience of state policy (especially for countries with transition economies and developing countries) shows that for effective socio-economic development, the country should use measures to ensure regional development (Abbaszade, 2021). It should be noted that the region, which is a separate socio-economic complex of the country, is not a reflection of the problems of the common system (i.e., whole country), however, the aggregate problems in each region can be considered as a very close reflection of problems in the country (taking some simplification) (Bozhko, 2012). It also says that each region will have its own development features, and therefore each of them should be treated with a special approach both for policy and for the introduction of closed-loop technologies. Therefore, it is important to consider how the introduction of closed-loop technology within the Ukrainian regions or amalgamated territorial community will affect the implementation. The creation of the latter was caused by reforms in the regional development of Ukraine, which was accompanied by the unification of the previous village local government. This allows to increase the effectiveness of development of regions of the country at once several ways, which is described in detail later in the work.

Therefore, the purpose of this work is to monitor how closed-loop technologies will influence on the development of socio-economic security of Ukraine. The object of this work is the regions of Ukraine and the influence from the introduction of the concept of circular economy on their territories. The novelty of this study lies in the considering the concept of a closed-loop technologies as a method of achieving social and economic security at the regional level, which is not a widespread and studied topic within the framework of modern Ukrainian economic literature.

## 2. MATERIALS AND METHODS

Firstly, it is worth noting that among the scientists there is no single notion of so-called "closed-loop technologies". Together with the word "closed-loop" basically used "economy". In other words, the scientists describe the "economy of a closed-loop", which is a close concept to the "circular economy", which was considered in the introduction, and is also considered further in the article. For these reasons, in this study under closed-loop technologies, the author proposes to understand the methods by which it is possible to bring into effect the concept of circular economy.

Besides, the important question is the definition of social and economic security, as different scientists understand it in different ways. Thus, for a long time only the concept of "economic security of the region" was used. Abalkin (1995), for example, considered it a combination of conditions and factors ensuring the independence of the region, its stability and fixity, ability to permanent reproduction and self-improvement. Knorr and Trager (1977) considered that the absence of threats of changes in the volume and distribution of income and wealth; employment levels. Inflation, access to the market, supply of raw materials, etc. in contrast to them, there is an idea that economic security is only a sub-

component of social security, one in general scientists are forced to think that social and economic security is a concept of comprehensive and complex, because it invests both in ensuring economic development and meeting the needs of people and society. The so-called social and economic security of the region is considered either the quality and life of the population or the existing state of tension of society on a certain territory (Bielai, 2010). Nevertheless, the author considers that it is important for the region to resist the curves and decide them by its own forces, to ensure stability for its own citizens. Therefore, within the framework of this study, the socio-economic security of the region is defined as the ability of the region to withstand any external and internal shocks, as well as to be least dependent on the state leadership (in the sense, not to need their help in case of problems). As for the concept of "region", which can mean both a spatial, natural-geographical and political-social concept, we will have an oblast or amalgamated territorial community, i.e. the regions connected with social, economic and spatial ties; If necessary, there is a clarification on which of these two concepts is being discussed in the study (Angrisano et al., 2019).

The work can be divided into three main stages. At the first stage the main existing problems in the activity of regions of Ukraine and their social and economic security are described. Also, the data on the rating of regions by level of socio-economic development and the main reasons of the current situation in the country are shown. The second stage shows the model of functioning of the concept of circular economy and describes the basic principles and peculiarities of its work. At the third stage, the main positive and negative changes that will bring introduction of closed-loop technologies into the development of the region, as well as how this concept will influence their development, are analyzed. In addition, the examples of the introduction of this concept in the world and the options for its implementation in Ukraine are described.

## 3. RESULTS AND DISCUSSION

### 3.1. Analysis of the Current State of the Regions of Ukraine

The current situation in the development of Ukrainian regions is connected not only with their capabilities, but also with the reform of the decentralization of government, which was launched in 2014. Therefore, it is important to consider in detail how it affects the development of Ukrainian regions. The main achievement of this reform is the increase in revenues of local budgets as a result of community unification and the introduction of new administrative-territorial division of Ukraine as a result of the consolidation of districts, the revival of economic activity in Amalgamated territorial communities (there has been revival of business activity, increase of number of establishments of food, shops), increase of the level of attraction of citizens to social and public life, etc. (2021). Incentives to the process of unification were formed through the publication of subventions to newly created Amalgamated territorial communities; reduction of the number of administrative centers (their number decreased by more than 5 times) made the process of budget management and distribution much easier, and thus in-

creased efficiency of budget use. In addition, budget expenditures were reduced by reducing the number of civil servants, which, at the same time, caused temporary unemployment problems due to significant reductions in staff. Decentralization has also increased the powers of communities, giving them more space to implement projects in different spheres (culture, health care) within their facilities.

Although this reform has generally brought many positive changes to the life of communities and for Ukraine, it has also had some negative aspects. Among them are the massive reduction in unemployment rates in some regions and the increase in contradictions between the centers and regions in local self-government policy (which is connected with increasing financial independence in newly created communities). In addition, the lack of official executive committees, as well as some problems in the consolidation of decentralization reform into the constitution (Bugriega and Krugliashov, 2021) are important problems that still exist in the community. Some scientists also have doubts about the fact that local authorities will be able to effectively independently fulfill their authority for the development of regions, primarily because of the low qualification of local self-government staff personnel (Vasylenko and Dobrovinsky, 2017). Another problem is not a complete understanding of the essence of the reform by the local population, because district administrations and local governments have faced (and are still facing) with opposition and negative moods among local residents, the risks of corruption and issues of regulation of local self-government (Drebot and Semehen, 2019) also increase. The existing issues require special solution and attention from the authorities to address regional development issues.

In recent years, the Ministry of Communities and Territories Development has published a rating of the regions according to the level of socio-economic development. Although it cannot be considered a reliable reflection of the socio-economic security of the regions, it is a significant approximation of the existing picture. The ranking of regions from 2015 to 2020 by this figure is shown below, in Table 1.

**Table 1. The rating of regions of Ukraine and Kyiv by Level of Socio-Economic Development from 2015 to 2020.**

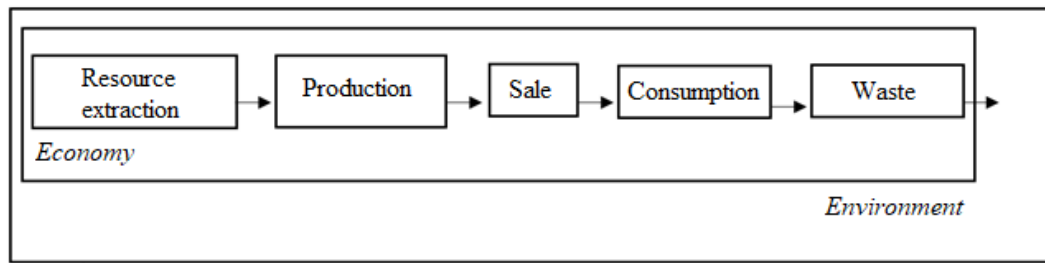
City	Year					
	2020	2019	2018	2017	2016	2015
	Place in the rating					
Kyiv	1	1	1	1	1	1
Rivne	2	4	3	3	6	11
Vinnitsia	3	2	4	7	4	7
Kharkiv	4	6	2	2	2	2
Lviv	5	8	11	9	13	9
Khmelnyskyi	6	17	12	11	8	13
Ternopil	7	10	7	6	20	15
Kyiv Oblast	8	5	8	14	3	6

Chernivtsi	9	7	6	5	5	3
Kirovohrad	10	9	15	17	18	21
Zhytomyr	11	16	13	12	11	16
Volyn	12	18	14	10	9	12
Odessa	13	13	22	21	15	18
Dnipro	14	3	5	4	10	5
Sumy	15	21	17	19	23	19
Chercasy	16	11	8	16	7	10
Ivano-Frankivsk	17	14	16	8	12	4
Poltava	18	15	10	15	17	14
Zakarpattia	19	20	19	13	16	8
Chernihiv	20	22	23	22	22	23
Kherson	21	19	18	18	21	20
Mykolaiv	22	12	21	23	19	22
Zaporizhzhia	23	23	20	20	14	17
Luhansk	24	24	25	24	24	24
Donetsk	25	25	24	25	25	25

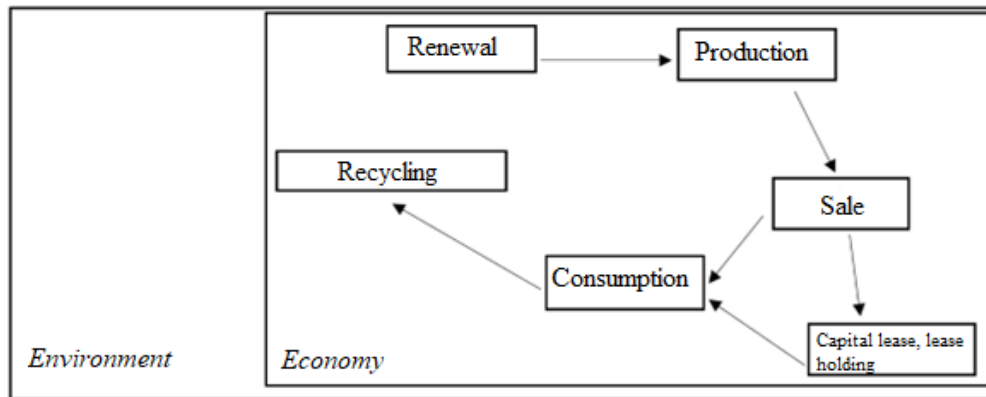
Source: compiled by the author on the basis of data Ministry of Development of Communities and Territories of Ukraine. Rating Assessment of Regions (2022).

Table 1 shows that the country has a significant instability in the development of regions: although Kyiv is the first place in the country, the last – Donetsk and Luhansk regions, the other regions change their positions in the rating year after year. So, we can see that in 2018 Odessa region reached 22 places in the rating of socio-economic development, whereas in 2019 already 13; Dnipro region took 3 places in 2019, but already 14 in 2020. At a more detailed analysis it is possible to notice similar tendencies in development of whole parts of Ukraine. In fact, inequality in the development of regions is a normal phenomenon for countries, and therefore different competitive advantages at all levels. Nevertheless, we should strive for the uniform development of all regions as far as possible, as this leads to an increase in efficiency of functioning of the economy.

The main threats related to the development of regions in Ukraine are the following: low level of technology use; outdated production equipment; low profitability of production; changes in the structure of incomes and expenditures of population; high differentiation of population by level of life; instability on external, internal political and social levels; low efficiency of taxation and use of funds. Also, the decline in competitiveness of national producers and high level of corruption of the state apparatus and many others (Petrenko and Polischuk, 2020). To solve each of these problems it is necessary to use fundamentally different methods. Nevertheless, state and local authorities should be able to ensure sustainable development of regions in order to guarantee social and economic security for the region. It is worth paying special attention to attraction of highly qualified human capital, since during the research of economic well-being of regions



**Fig. (1).** Model of linear Economy Functioning.  
Source: compiled by the author on the basis of data Valko (2018).



**Fig. (2).** Model of cyclical economy functioning  
Source: compiled by the author on the basis of data Valko (2018).

of Ukraine and determinate, which influence it. It was revealed that the greatest influence on this is made by human capital (Getzner and Moroz, 2021).

**3.2. Fundamentals of the Circular Economy Concept**

As it has already been mentioned, the basis of the circular economy is the re-use of products and waste products in order to save resources. For the first time this concept was mentioned back in the 1960s, which was caused by a significant pace of industrial development in the world. However, this model is somewhat more complicated, because it provides for the possibility of renting, repairing, leasing and other types of prolongation of the product life, while the basis of the "linear economy", which is often opposite the circular, lies in the use of products and its immediate "destruction", which leads to significant problems for the environment (Mashukova, 2016). Under the conditions of the "linear economy" production is cheaper because the extraction of the majority of resources is not a cost-effective type of activity. As producers strive to improve their competitive opportunities, this model has evolved in the process of human evolution; it can be called a kind of market failure, because reducing the cost of production makes mankind harm itself in the long term. In order for the circular economy to function, it is necessary to spend considerable sums of money to build technologies of processing of products, which in the short term will increase the cost of production and will decrease in the long term. Nevertheless, this is a significant problem for the implementation of the circular development model, especially in the conditions of modern Ukraine (Bureha and Kruglashov, 2021).

For a more visual comparison of these concepts the author has built two models showing production and sales processes under the conditions of circular and linear economy. They are shown in Figs. (1 and 2):

Fig. (1) depicts the concept of the "linear economy", in the process of production of which the products fall into the environment; While Figure 2 shows the model of the circular economy, where a large part of the production is going to be restored, but (since in modern conditions processing absolutely all waste is impossible in most cases) the other part, which is non-processed, still falls into the environment. Thus, non-recyclable waste can be marked as NRW (non-recyclable waste), and those that are recycled are RW (recyclable waste). Then it is possible to say that the basic model of circular economy is to minimize NRW, i.e.,  $NRW \rightarrow min$ , and maximization of RW, i.e.  $RW \rightarrow max$ . Pachomova and Richter in their work also allocate own produced products  $r$ , the output of which should be minimized, and satisfaction of human needs will be due to asceticism brought up in them and understanding of the need for low consumption; the need for new products will gradually decrease due to the increase in the life cycle of products (Pakhomova and Riechter, 2020). However, according to the author, this concept is doubtful for several reasons. The most important of them are: firstly, as we know, human nature does not change so quickly (even if people are trained in modern environmental needs) in order to be able to implement asceticism in people in a short time (especially taking into account modern trends in a significant increase in consumption in society); secondly, there is a question about how the current growth rates in countries will be maintained while the economic activity in

countries is reduced and how this will affect not only the economic development, but also the technology. Therefore, although the reduction of output would definitely reduce environmental pollution, this practice is doubtful for realization and may become a threat to the economy of the countries of the world.

As it has already been mentioned, the concept of circular economy can be introduced both within the economy and within smaller limits, that is, on the territory of regions and enterprises. Of course, the effect in each case will be different, and the smaller the area will be implemented this concept – the lower the effect. There are working business models for the introduction of this concept within enterprises, which are mainly oriented on replacement of usual resources with effective natural substitutes, on restoration of already used resources, on increase of life cycle of the product or use of the product and service (i.e. granting of goods for temporary use) (Mochalova, 2020). There is a real practice in the world in applying all these types of business models, especially common ones, in the countries of the West, and they can be introduced within Ukraine as well. When the author speaks about the introduction of this concept within the territory or country, he/she means the formation of relations between enterprises (private, and if necessary – and the creation of state or mixed enterprises), which will form in general a single module of production, depicted in Figure 2.

### 3.3. Implementation of the Closed-loop Economy within the Region in Ukraine

As a first step, it is worth noting that the goals that the regions of Ukraine need to achieve and which can give them the introduction of closed-loop technologies are quite similar. For example, the circular economy allows entrepreneurs to be less dependent on resource prices (since they will have their own base on recycled waste), the introduction of this concept allows them to increase the number of jobs on the territory (that is, to have a positive social effect), to be an incentive for infrastructure development, logistics and information technologies, reduce environmental stress. Special attention should be paid to increasing the independence of the region, as this is the main goal of modern decentralization. Although, as described below, a policy in the regions aimed at stimulating enterprises to introduce processing technologies is important for the introduction of an effective model of a closed-loop economy, the main requirements for its functioning remain developed market institutions, regulatory and legal system, and existence of a clear long-term goal in the state policy, overcoming corruption problems at all levels of public administration. Thus, for the effective functioning of this model within the regions, the initiative should be primarily on the part of the state, not just local authorities.

Speaking about methods of stimulation of introduction of closed-loop technologies on a certain territory, one can distinguish several basic, among which there will be economic or financial, that is, monetary support in various its modifications, and normative-legal, that is, creation of laws, on which enterprises are forced to introduce within their limits methods of a circular economy. The first type of methods is more effective in the long-term perspective by its nature, and the second type is more efficient in the short-term, but cre-

ates losses in the long-term perspective. This is due to the nature of each method: voluntary and compulsory. Also, the first method can be applied both at the level of the country and at the regional level, while the process of adoption of laws is a purely state benefit. In addition, not only enterprises, but also other important sectors, such as health and education (Shpak et al., 2020), need to be developed at the same time. Therefore, the role of public administration and management at all levels plays an important role for the effective functioning of the concept of closed-loop economy. However, this management is a problem in itself, because it is difficult to achieve effective management in the public sector, especially in the existing corruption problems, which should also be solved. Thus, under the conditions of modern Ukraine, the introduction of this model will be rather difficult; nevertheless, it is not impossible.

The positive impact on the development of the region and, in particular, on its social and economic security was considered above. However, there are also negative effects, which are typical only in the short term. This is a temporary increase in the number of unemployed due to the reduction of the role of resource extraction sectors and the need for significant funds to implement this concept. Therefore, one of the most important methods of support was allocated financial: the companies will need a considerable amount of funds for equipment of enterprises by processing technologies. This will increase the price of the products at the initial stage, which may make the products of these enterprises less attractive, especially for the poor people. As a matter of fact, enterprises may need subsidies to reduce the cost of production. This is one of the main reasons for the important role of scales where this concept is introduced, because the larger the scale – the less noticeable the rise in prices will be. However, after recouping of all costs for technological upgrading, enterprises with introduced closed-loop technologies will become more competitive than others, and their profitability will become higher. Thus, without active participation of the state and its financial support, the implementation of this model is difficult and impossible.

For a better understanding of the functioning of this concept, real examples of its implementation can be considered. So, the plant "Reno" in the French city of Choisy-le-Roi, by means of the concept of a closed-loop economy, in 2015 was able to save about 80% of electricity and water and 4 thousand tons of metal; In the company, planning of construction of the closed-loop process takes place at the stage of planning and development of plants or parts, which allows to simplify dismantling and processing, than to optimize later use (Mashukova, 2016). There are attempts to introduce this concept on a larger scale. So, the construction sector of Amsterdam has taken a course for recycling: now 98% of the building materials of the city are being processed, and about one third of waste is used for energy generation (Gavanyuolo et al., 2019). In order to achieve such results, the authorities have formed a number of programs, each of which has specialized in developing opportunities for waste use in a certain niche. So, for plastic processing have been created the program for re-use of plastic for fuel from ships, re-use of plastic in the port area, program of stimulation for families that reuse plastic, etc. e. Today, the concept of sustainable development is formed in London. This is based on production of

"low-carb products", optimization of the energy sector and improvement of waste utilization efficiency. By 2036, it is expected to receive income from the concept of 7 billion pounds and create about 40 thousand jobs in many sectors of the economy (Kodnaeva, 2020). Examples of the formation of a circular economy within the country are not yet known to the world, but it is likely that they will appear in the future.

In general, in Ukraine some principles of the circular economy have already been introduced by companies and the state. So, in the regions of the country began to build factories on processing of certain kinds of products, and this practice continues. The number of such plants is increasing every year. The government should promote this by means of the methods considered above. Nevertheless, in Ukraine is not widespread development of rental and leasing, which is one of the components of the concept of circular economy. A small number of leasing companies in Ukraine could receive tax subsidies or support in obtaining cheap loans. It is also important to increase the awareness of citizens about these companies, because they are not too well known among residents, and in small cities they are often not represented. An interesting idea is the idea of a voluntary exchange between residents, which has already been partially implemented in the book sphere. Small premises where people could exchange books could not only partially raise the educational level of the population, but also increase the life cycle of the book. Although this example is quite banal, the exchange practice can be developed in all spheres. One of the options is to create a local site that would allow people to exchange goods of absolutely different origin. These methods are low-cost, but at the same time will not lead to a sharp transition to a circular economy. However, it is such trifles that the state of regions and the country in all spheres is formed.

Therefore, closed-loop technologies would certainly have a positive impact on the development of Ukraine's regions in the long term. It would be mainly due to the increase of independence of regions, decrease of production cost, increase of profitability, creation of new jobs, etc. Nevertheless, such changes would have brought some difficulties in the short term, as they would have led to significant costs for processing technologies, and thus to a temporary rise in the price of products. Because of such losses, at the initial stage this model will require serious state intervention, mainly from financial support. The peculiarities of Ukraine's development in modern economic, social and political situations make the introduction of this concept a difficult task, but possible. The beginning of the activity toward this model can be started even from the smallest steps on the part of local communities, and the state is not obliged to start financing the road processing equipment for plants, but to start from other spheres, such as leasing and rental.

#### 4. CONCLUSIONS

The situation with social and economic security of the regions of Ukraine was analyzed in this research. The author came to the conclusion about instability and inequality of development of regions of the country, which is explained by some factors such as political and economic situation, low efficiency of regional management, corruption, historical and

natural differences in competitiveness of regions and others. Having analyzed the main benefits, among which the main ones are decrease of dependence on resource prices and increase of profitability of products in the long-term perspective, which can be obtained from introduction of technologies of sustainable development, it became clear that this concept is suitable for increase of socio-economic security of regions.

The main condition of effective functioning of this model, at least at the initial stage, is the state influence. It can be carried out in many areas, but the main ones were allocated two, which in fact are the opposite: financial incentives and administrative and legal force. Their opposite is that the first method is more effective in the long term, and the second one is more effective in the short term, due to the existing pressure, through which companies react quickly, but inefficiently. Thus, the most effective would be the predomination in the state policy of the first method, and the situational use of the second method. Due to the need for state action in the implementation of this concept, certain problems may arise, characterized primarily by inefficient management of state bodies and the need to allocate significant amounts for project financing. Nevertheless, it is still possible. Real cases of implementation of this concept can be an example for policy-making, in particular in the major trading cities of the world in Amsterdam and London, and local authorities can start their activities independently in small steps, such as creating real or virtual points for the exchange of goods by local people.

Therefore, Ukraine has a real chance of effectively introducing a model of a circular economy within its regions. The achieving this goal requires a significant increase in the effectiveness of the functioning of the state machinery.

#### REFERENCES

- Abalkin, L. I. (1995). Economic Security of Russia: The Threat and Their Reflection. *Economic Issues*, 1, 127-134.
- Abbaszade, M. (2021). The Main Directions of Regional Economic Development in the Conditions of Modern Market Economy. *Agroworld*, 5, 82-86.
- Aleksandrova, V. D. (2019). The modern concept of the circular economy. *International Journal of Humanities and Natural Sciences*, 5, 87-93.
- Angrisano, M., Gravanguolo, A. and Girard, L. F. (2019). Circular Economy in Eight Historic Port Cities: Criteria and Indicators Towards a Circular City Assessment Framework. *Sustainability*, 11, 1-24.
- Bielai, S. 2010. Application of the Taxonomic Method for Assessing the Socio-Economic Security of the Regions of Ukraine. [http://www.dridu.dp.ua/vidavnictvo/2011/2011\\_04\(11\)/11bsvbru.pdf](http://www.dridu.dp.ua/vidavnictvo/2011/2011_04(11)/11bsvbru.pdf)
- Bozhko, Yu. N. (2012). Strengthening the role of the region in the socio-economic development of the national economy as a vector for improving regional policy. *Socio-Economic Phenomena and Processes*, 10, 29-33.
- Bureha, V. and Kruglashov, A. (2021). Achievements and difficulties in the implementation of decentralization of power in Ukraine. *Aspects of Public Administration*, 9(2), 68-76.
- Drebot, N. P. and Semehen, I. B. (2019). Decentralization Reform in Ukraine. Current Situation and Development Prospects. *Scientific Bulletin of NLTU of Ukraine*, 1, 24-27.
- Getzner, M. and Moroz, S. (2021). The Economic Development of Regions in Ukraine: With Tests on the Territorial Capital Approach. *Empirica*, 49, 225-251.
- Haustova, V. E. and Omarov, Sh. A. (2018). The Concept of Sustainable Development as a Paradigm of Development of Society. *Economic Theory*, 1(35), 265-273.

- Knorr, K. and Trager, F. (1977). Economic Factors as Objects of Security; Economic, Security and Vulnerability. *Economic Issues and Security*. Lawrence, 1, 67-98.
- Kodnaeva, S. I. (2020). Circular Economy: Current Approaches to Content and Measurement. *Economics: Abstract Journal*, 1, 51-58.
- Mashukova, B. S. (2016). Basic principles of the circular economy. *European Science*, 7(17), 14-16.
- Ministry of Development of Communities and Territories of Ukraine. Rating Assessment of Regions. (2022). <https://www.minregion.gov.ua/napryamki-diyalnosti/derzhavna-rehional-na-polityka/monitorynh/monitorynh-monitorynh/rejtingova-otsinka-regioniv/>
- Mochalova, L. A. (2020). Circular Economy in the Context of Implementing the Concept of Sustainable Development. *Journal of New Economy*, 21(4), 5-27.
- Pakhomova, N. V. and Rikhter, K. K. (1999). *Environmental Economics and Environmental Management*. Saint Petersburg: University.
- Petrenko, N. O. and Polishchuk, O. A. (2020). Formation of Economic Security of the Region: Theoretical and Methodological Aspect. *Investments: Practice and Experience*, 21, 112-118.
- Raiser, K., Kornek, U., Flachsland, C. and Lamb, W. F. (2020). Is the Paris Agreement effective? A systematic map of the evidence. <https://iopscience.iop.org/article/10.1088/1748-9326/ab865c#erlab865cs5>
- Sharma, R. (2009). Sustainable Development: The Way for Future, Where Are We? *Indian Journal of Community Medicine*, 34(4), 276-278.
- Shpak, N., Kuzmin, O., Melnyk, O., Ruda, M. and Sroka, W. (2020). Implementation of a Circular Economy in Ukraine: The Context of European Integration. *Resources*, 9(8), 1-15.
- Skutaru, L. (2013). Economic Development Versus Sustainable Development. *Ecoforum*, 2, 35-40.
- Valko, D. V. (2018). Circular Economy: Theoretical Model and Effects of Implementation National Interests: Priorities and Security, 14(8), 1415-1429.
- Vasylenko, L. and Dobrovinsky, M. (2017). Decentralization and Local Government Reform. *Administrative Law and Procedure*, 3, 123-126.

---

Received: June 21, 2022

Revised: Jul 10, 2022

Accepted: Oct 14, 2022

Copyright © 2022– All Rights Reserved

This is an open-access article.