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Landscape and circular economy as a mechanism of sustainable development in globalisation and digitalisation of the world economy

Abstract. The concept of a circular economy is becoming a central component of local and regional economies. Therefore, the purpose of this research was to identify the impact of landscape development and the circular economy on achieving sustainable development goals in the context of globalisation and digitalisation of the world economic system. The following methods were used: system-analytical – to evaluate the details of the structure and functioning of mechanisms of state regulation in the formation and development of the circular economy; categorical and analytical – to demonstrate the theoretical foundations of the formation of a purposeful state policy in the field of development. Digital distribution has great potential for implementing the principles of sustainable development and changing consumer behaviour and outlook in the context of globalisation and digitalisation of the world economic system. It has been studied that the depletion of natural resources creates problems for the future development of industry, providing the world's population with material goods and quality of life. As a result of the irrational use of nature, the increase in material intensity, and inefficient resource provision, there is a deterioration of the ecological state, the depletion of natural resources, a decrease in the efficiency of enterprises, and a deterioration in the quality of products. Based on the analysis, it is concluded that the idea of sustainable development has emerged as the primary paradigm for social development in the future and that one of the mechanisms achieving these goals is the development of the circular

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economy because of its connections to processes like the globalisation and digitalisation of the world economy, the stimulation of innovative activity, and the advancement of digital distribution. It is concluded that this can be considered one of the mechanisms for achieving goals. The provisions, findings, and suggestions produced enhance the theory and practice of the development of the closed-loop economy, which is the practical importance of the acquired results

■ **Keywords:** resource cycle; local government; innovative activity; digital distribution; environmental condition; economic development

■ INTRODUCTION

It is almost impossible for the conventional economy to serve as a positive role model for how society will evolve in the future. Large-scale resource usage has had unanticipated and essentially irreversible effects on regional ecosystems as well as the biosphere overall. The notion of sustainable development is currently capturing the attention of the global community and is poised to transform society's development paradigm going forward. Nevertheless, there isn't much support globally for the systems that would put the ideals of sustainable development into practice. One of the best ways to put the concepts of sustainable development into practice is through the circular economy. The circular economy aims to recover and use resources in a reasonable manner, replacing the current economic structure (Goyal *et al.*, 2021). Furthermore, the circular economy is linked to the ideas of sustainable development and seeks to lessen the negative effects of human activity on the environment.

According to studies by A.J. Hoffman (2018) and M. Varfolomeev & O. Churikanova (2020), circular economy began to develop actively as a result of deep technological, economic, and social changes, including the following. Technological change: the widespread use of 4th Industrial Revolution technologies and the development of the global Internet have changed consumer attitudes towards product ownership, purchase, and use. Economic changes: the digitalisation of the economy, the virtualisation of transactions, and the widespread adoption of e-commerce, on the one hand, and the economic crisis and declining levels of employment and purchasing power, on the other, have changed attitudes towards how products are owned and how they are used. Social changes: consumption as the main meaning of human life and growing opportunities to satisfy needs with the lowest costs have led to a significant increase in communal consumption.

K. Pouikli (2020) considers the circular economy as an economic system of closed cycles, based on systemic thinking, using renewable energy sources with the least possible loss of the value of raw materials, components, and products. J. Korhonen *et al.* (2018) consider the key foundations of the circular economy, the definition of the principles of the circular economy, as well as the definition of the problems of the implementation of the circular economy in modern conditions, and B.C. Lin (2020) considers the circular economy in the context of sustainable development and draws attention primarily to active cooperation between producers and consumers. In their investigation and analysis of COVID-19's effects on the global ecosystem, T. Ibn-Mohammed *et al.* (2020) make the case that substantial structural changes in the economic model – but most importantly, in people's attitudes towards it – are necessary for the sustainable growth of the world

economy. However, despite numerous publications in the fields of sustainable development and circular economy, the importance of digital distribution in the context of increasing sustainability remains unclear.

Among the global problems, one of the most important is the problem of optimising the interaction of humanity with the surrounding natural environment. In the conditions of the modern scientific and technological revolution, the general scale of the impact on the surrounding natural environment of industry, agriculture and transport – in other words, the entire set of forms of human life activity – is such that there are many adverse consequences of this activity, and above all, various forms of pollution and degradation of the natural environment become more and more obvious and wide, spreading far beyond the borders of those territories where such activity is concentrated. Therefore, it is quite natural that concern about the fate of the environment as the basis of sustainable development and the existence of all mankind is growing all over the world. Human development requires a transition to a “green” economy – a system of economic activity related to the production and consumption of goods and services that leads to an increase in human well-being without exposing future generations to significant environmental risks. As a result, the global growth of the circular economy is a pressing issue. In order to accomplish the aims of sustainable development in the context of globalisation and the digitisation of the economic system, this paper will examine the effects of landscape development and investigate the theoretical framework of the circular economy.

■ MATERIALS AND METHODS

In the context of globalisation and the digitisation of the global economy, to complete the research assignments pertaining to the notions of landscape development and the circular economy of sustainable development, attention is focused on general and specific methods of studying economic processes, development, phenomena, and facts, first of all, which are related to resource integration and digitisation. In the course of the study, general scientific and special research methods were used: analysis and synthesis to examine economic processes and phenomena; generalisation of theoretical and practical material; the main provisions of economic, statistical, and comparative analysis; forecasting of socio-economic processes; and graphical interpretation. To achieve the goal of the research, a logical-heuristic approach was used. This method made it possible to assess the level of digitalisation of the country's economy, understand its impact on economic growth, identify risks that affect the effectiveness of digital transformation, and justify how, as a trend of the development of a circular economy and society, digitalisation affects the

modern world. The hypothetical-deductive method was applied to find out the essence of the research object.

To generalise the definition of concepts, a number of theoretical and categorical provisions were analysed. Methods of analysis and synthesis – to summarise the scientific experience of strategic management in the conditions of the modern circular economy. Using the methods of grouping and systematisation, the approach to the interpretation of the concept of “closed-loop economy” is generalised, motives and goals are classified, types of strategies for the implementation and development of the closed-loop economy are developed, the main obstacles to the strategic management of enterprises operating in the conditions of the closed-loop economy are summarised, and an evaluation system is formed to determine the effectiveness of strategies for the implementation and development of the closed-loop economy. The graphic method is for clarity of presentation of the theoretical and methodological material of the work. A visual presentation of the impact of the circular economy on the achievement of sustainable development is offered. The process approach is the determination of the structure of a purposeful, comprehensive policy of the state. A systematic and comprehensive approach to the implementation of a closed economy can be implemented as a whole, but at the same time, the

characteristics of a closed economy are the basis of each regional or city system. The informational and analytical basis of the work is the legislative and by-laws of the state, which regulate the issue of the competitiveness of the economy; the scientific achievements of researchers; the statistical data of state authorities; and the authors’ research.

■ RESULTS AND DISCUSSION

In reaction to the depletion of natural resources, civilisation developed the idea of a circular economy. In a broader sense, the circular economy is a new paradigm for economic systems, with its key components being the judicious use of natural resources, their restoration, and the balancing of social and environmental relations. It is founded on the realisation that nature is cyclical and that humans must learn to live within the bounds of closed systems, as well as on a paradigm shift in human behaviour towards the environment. As a result, society is forced to make a choice about further development. Traditional industrial development has drained a large amount of minerals from the earth’s interior, depleted the soil, and caused environmental pollution. The very prospects of the future existence of modern societies were under threat. According to projections of mineral reserves, modern industrial production may continue for several more decades (Table 1).

Table 1. World reserves of certain minerals

Resource type	The number of years for which the resource will last
Coal	270
Oil	53
Natural gas	60
Gold	19
Iron Ore	93
Aluminium	31
Zinc	18
Copper	21
Uranium ore	80
Indium	10
Tin	16
Lead	19
Silver	20

Source: compiled by the authors based on J. Vaupotič (2024)

These figures are subject to adjustment and are not final. However, the essence of the problem of resource depletion remains unchanged. It is easy to assume that the world to which the population is accustomed will be completely destroyed. In the coming decades, the global economic system will have to prepare for the absence of such natural resources as oil, natural gas, and silver, which are now necessary for the modern economy. Moreover, the demand for certain materials and resources is likely to increase rapidly. For example, global demand for lithium is growing rapidly against the background of information about the development of electric vehicles and electrical engineering. However, with the advent of new technologies, it can be expected that the demand for this mineral will decrease sharply while the demand for other minerals will increase (Sidhoum, 2018). The same is happening with oil, which was the world’s main source of energy a few decades ago. With the advent of new technologies and the development

of the gas industry, as well as the development of nuclear technologies and alternative energy sources, the share of oil in energy carriers is gradually decreasing.

For the modern economy, the landscape is the most integral and common resource and the most important in the life of the population of any country. According to the European Landscape Convention (ELC) of the Council of Europe, it is the landscape approach that should be prioritised when solving key environmental problems and preserving the historical, cultural, and natural heritage of Europe. The socio-economic sphere of the landscape is formed by a set of managed systems that are created for the rational use of natural and socio-economic resources with optimal provision for their needs. The control that a person exercises over the development of the sociosphere varies depending on the nature of the laws of social development (De Jesus & Mendonça, 2018). Man is able to regulate the functioning of socio-economic systems in such a way that the

material and energy components of the geosystem are maintained at a level that allows optimally meeting the needs of human society and contributing to the sustainable development of the circular economy. This means that when “exiting” the geosystem, part of the information, on the contrary, is sent in the form of “input”, which ensures the regulation and stability of the system as a whole.

The problems of determining the supply of resources arise due to the difficulties of assessing geological deposits. For example, in the 1970s of the 20th century, the first alarming forecasts regarding the depletion of natural resources were made. Humanity was told the figures of 30–40 years to run out of oil, natural gas, etc. After more than half a century, the earth still contains natural gas and oil. This is a result of advances in deposit discovery and development techniques, as well as the application of new machinery and technology. As a result, estimating mineral reserves is a very difficult procedure with a lot of unknowns. However, this doesn’t alter the fundamental nature of the problem – namely, the depletion of natural resources. There is only one solution to the global resource crisis: technological advancement, adherence to closed-loop system theory, and adoption of circular economy concepts.

In addition to the problem of mineral depletion, attention should also be paid to other problems arising from deforestation, air pollution, the marine environment, the loss of biodiversity, and the neglect of the rules of traditional agriculture and the development of natural ecosystems. Logical questions arise about possible ways to ensure that the future of modern society does not have such prospects. Prospects for a better future are presented in the concept of sustainable development (Velasco-Muñoz *et al.*, 2018).

A key principle of the concept of sustainable development is intergenerational equity, which means that current generations must take into account guarantees of the ability of future generations to meet their needs. In other words, the world should prioritise qualitative rather than quantitative indicators of development. The notion of sustainable development may be seen as a comprehensive paradigm of human growth for the future, as evidenced by its six key aspects: economic, social, political-legal, international, ecological, and informational. Changing perspectives on the pillars of society’s existence, such as its interactions with the environment and other people, is the first step towards sustainable development. Sustainable development is a dynamic idea. Despite the criticism of certain provisions of the concept of sustainable development, society has not been offered a better one to date.

In the process of the evolution of socio-economic systems, their territorial specialisation occurs. Specific regions specialise in a specific monoculture. For the purpose of sustainable development in a particular region, the stability of the system can be maintained only through interaction with other regions of the country. As a result, a socio-economic geosystem of higher order emerges, which includes a number of factors (Zeweld *et al.*, 2017). The sustainable growth of the nation’s regions and the nature of the terrain are impacted by the specialisation of socio-economic systems. A global strategy is required to address the population’s most urgent issues in the global community. It is sufficient to remember how the coronavirus pandemic affected the global economy’s rate of growth and the

conditions of each of its different businesses. Therefore, no country can stand aside from the problems of the development of the world economic system. However, the practical implementation of the principles of sustainable development has encountered problems that can be divided into different categories: political, economic, technical, legal, informative, etc.

The landscape sphere is a hierarchically ordered geosystem. It is a complexly organised open system, the main components of which are interconnected by direct and feedback links, are interchangeable, and partially interpenetrate each other. The impact on individual components causes a chain reaction in the system, which eventually transforms its other elements as well. The basis of the integrity of the landscape sphere is the exchange between the components of the system, where the continuous exchange is accompanied by a change in the structure of the landscape sphere. It should be noted that the rate of change is not the same in different components, which is a characteristic property of the landscape sphere as a self-regulating system.

Thus, four main approaches to defining the term are distinguished. Landscape as a territory. Such an interpretation is considered regional and is hardly used today, as it is limited in definition with an emphasis on territorial boundaries. Structure (pattern) is first and foremost understood as a combination of interacting spatial elements, their area, arrangement, orientation, neighbourhood, connectivity, or fragmentation (Geng *et al.*, 2019). Structure is interpreted as the result of radial and lateral processes, as an indicator (one) and a state (the other). This interpretation turns out to be particularly productive for areas heavily altered by anthropogenic activities, such as zonal landforms preserved in the form of several “islands”.

It is no coincidence that, at the initial stage, it was the theory of island biogeography by A.P.M. Velenturf & P. Purnell (2021) that served as the basis for the development of this concept. Landscape as a territory under human influence. As the first international treaty dedicated to all aspects of the landscape, the Landscape Convention of the Council of Europe addresses key issues in the fields of human rights, democracy, and the rule of law for sustainable development. The Convention applies not only to significant landscapes, but also to unusual and degraded landscapes. By taking into consideration the cultural features of the landscape, the signing nations affirm their desire to achieve sustainable development based on a balanced interaction between social demands, economic activity, and the environment. The agreement covers the entire territory, including natural, rural, urban, and suburban areas (Manning *et al.*, 2018). The landscape is used to denote a general idea of the relationship between components. This group consists of the largest number of definitions, which means that it is based on the relationship and active role of land users in the landscape that they use and that they will co-ordinately transform. J. Haegglom & I. Budde (2020) define in the landscape of the system triad an element, a connection with elements, a new quality arising as a result of a connection. In addition to the mentioned approaches, the landscape is considered from the position of levels that depend on certain characteristics (Fig. 1).

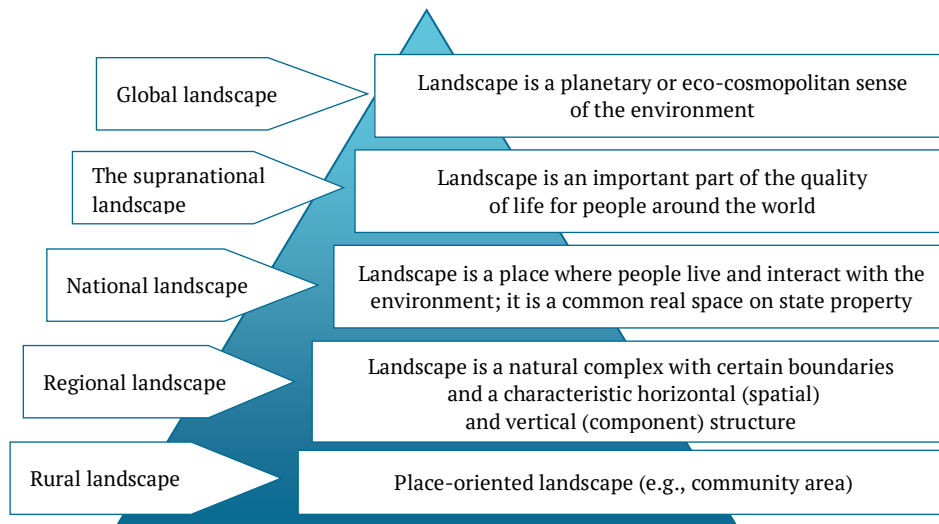


Figure 1. Landscape positions at different levels

Source: made by the authors based on K. Govindan & M. Hasanagic (2018), D. Reike *et al.* (2018), G. Sucozhañay *et al.* (2022)

In addition, one of the important features of the scale of the landscape is the role of the human population, in particular, as the main factor in disrupting ecological processes, which causes the heterogeneity of landscape components (Tura *et al.*, 2019). On the one hand, spatial landscapes are distinguished by V. Gurochkina & M. Budzynska (2020). From the viewpoint of an outside observer, spatial landscapes are perceived as a component of a broader (national, for example) space; conversely, they are place-oriented landscapes (i.e., the territory of a local community). The 1990s of the 20th century can be considered the conditional beginning of the theoretical justification of the circular economy, which was determined by the need to reduce, first of all, the load on the environment and optimise the use of resource potential due to a significant

increase in the world population from 3 billion people in the 1960s to 7.9 billion people in 2020, of which China and India account for the largest shares (Take action..., n.d.) In general, this approach became a continuation of the idea of ensuring the sustainable development of economies. At the same time, due to the intensification of research on the problems of ensuring sustainable development, confusion with the terminological apparatus has arisen in Ukrainian science, as the categories “circular” and “sustainable” development are often equated. Thus, S.I. Kodnaeva (2020) emphasises the complexity, ambiguity, and multifacetedness of the concept of “sustainable development”. The new term “circular economy” adds to these difficulties. Hence, there are fundamental differences between sustainability and circularity that were systematised (Table 2).

Table 2. Fundamental differences between sustainability and circularity of the economy

Sign	Sustainability of the system	Circularity of the system
Definition	Such a state of the system will provide for the needs of the current generation without reducing future opportunities generation	Possibility of regeneration of the system resources by designing it as such in order to minimise consumption of resources, goods, and waste
Characteristics of processes	Responsible for society and the environment	Closed, based on circulation resources and goods
Basic processes	Any processes between stakeholders that meet the principles of sustainability	Design and production, innovation, and services
Relationships between subjects	Responsible for society, current and future generations	Based on various agreements and contracts
Scope	Biosphere	Technosphere, man-made design for maximum circulation of resources
The main initiators	All stakeholders	Public authorities, business structures

Source: made by the authors

Thus, the circular economy is not an economic component of sustainable development but rather a strategy for its implementation. The circular economy also helps to minimise the risks of system operation, especially those related to the volatility of resource prices and the limited availability of resources on the world market. There is a supranational level between national landscapes, which form an integrated economy and infrastructure and form

a single perspective, and the global landscape, codified in Europe in the ELC. In the comments to the ELC it is stated that accordingly, the public is encouraged to actively participate in the management and planning of the landscape and to feel responsible for what happens to the landscape. ELC offers a multidimensional approach to landscape architecture and views local government as the primary level of landscape planning. The ELC defines landscape in

terms of social practice rather than aesthetics, taking into account various interests such as social needs, economic activity, and the environment. It is acknowledged that the landscape is of exceptional beauty in both urban and rural areas, in degraded areas, and of high quality (Tura *et al.*, 2019). The ELC aspires to include all landscapes, even those not of outstanding universal value in contrast to the UNESCO Convention on Historic Sites.

An area of land and water that was jointly created by humans and nature is known as a rural landscape. It is used to extract resources for agriculture, livestock and pastoralism, fishing and aquaculture, forestry, hunting, harvesting wildlife, and salt mining in order to produce food and other renewable natural resources. All rural places are also significant to people's culture, both in and out of towns. Thus, territorial borders are typically used to define landscapes. Politics, agriculture, tourism, ecology, technology, education, the military, and other factors are all framed by this demarcation of the landscape notion. The benefit of the landscape idea is that it makes it possible to comprehend the interactions between different natural and human variables in a constrained region in more detail.

Researchers summarise the main areas of activity that form the definition of "landscape": focus on land use (at first exclusively for non-urban areas, further included urban and urbanisation environments); direct aid to the protection of the ecological environment; understand the interaction of man and the environment, which leads to a change in the landscape; use interdisciplinary approaches from environmental and social sciences; and provide solutions to improve human and environmental well-being through design (Abbaszade, 2021). A model that can give impetus to the development of both the urban landscape and the global landscape is a circular economy model, which is based on the principles of resource efficiency, product life cycle control, the formation of an environmentally responsible environment, and the implementation of effective business models. Its solution is the development of a toolkit for strategic diagnostics of the innovative landscape of regions, characterised by the level of innovative development as a basic platform for the transition from a linear economy to a circular economy, taking into account the parameters of resource efficiency, environmentalisation, waste management, and secondary use of materials.

In 2001, UN Secretary General Kofi Annan delivered a report entitled "Changing consumption patterns" at the organisational session of the UN Commission on Sustainable Development in which it was proposed to develop effective measures to promote changes in consumption and production patterns in order to raise the standard of living of the population and simultaneously reduce the negative impact of resource consumption on the environment (Changing consumption patterns, n.d.). The 2012 World Summit on Sustainable Development launched the 10-year framework for sustainable consumption and production (10YFP), a global commitment to accelerate the transition to sustainable consumption in both developed and developing countries (The 10 year framework..., 2014).

In 2015, the 10-year framework formed the basis of the 12th UN Sustainable Development Goal, which includes: effective use of natural resources; target indicator; sustainable models of consumption and production in the food

industry; reduction of emissions of pollutants; reducing the level of environmental pollution due to waste processing; involvement of participants in the process of sustainable development, including the private sector; participation of the public sector in achieving the SCP through the effective practice of public procurement; dissemination of information among consumers and improvement of population literacy in the field of sustainable development and healthy lifestyle; financing and strengthening the potential of sustainable development; development of ecotourism; rationalisation of inefficient fossil fuel subsidies (Singh & Raghubanshi, 2019). The goal of the 12th Sustainable Development Goal of the United Nations is to replace the antiquated production and consumption paradigm with a more effective circular economy model, of which the sharing economy is one of the foundational elements. When building a model, the decisive influence of stakeholders should be determined. To consider their opinions, it is proposed to use a digital platform that allows you to collect and analyse big data. In this way, it is possible to ensure greater objectivity and relevance of the research conducted as well as the content of the developed recommendations.

Resource circulation is connected to the concept of product recycling. The core of the circular economy is the idea of "waste as food", which refers to using trash from one manufacturing process as a raw material in another, thereby lowering consumption by sharing or reusing items in addition to recycling. Creating a circular economy is one way to put the concepts of sustainable development into practice. This growth paradigm perfectly conforms to the fundamentals of sustainable development, as it is predicated on resource recovery and wise consumption. This growth plan is attractive because it can prolong the life of Earth's resources. Innovative efforts aimed at future scientific and technological advancements that will enable the creation of materials at the atomic level must go hand in hand with this process. Only then will future generations be able to meet their needs without depleting finite natural resources or harming the environment.

According to Yu. Neustroiev (2021), the following categories of business models align with the circular economy's tenets: circular value chains: they include substituting entirely renewable resources for scarce ones; restoration and processing: a paradigm whereby advances in technology offer a chance to both restore and process natural resources; maintenance of the product life cycle by rebuilding, repairing, or reselling – the concept is predicated on the shift from the selling of goods to the supply of services for their usage; shared consumption and use: a concept centred on granting access to resources or commodities with minimal utility; a product as a service is a business model where clients rent products or other assets and are paid according to how they use them. It should be noted that the sharing economy is not only closely related to the principles of the circular economy but is also one of its main links and ways to achieve sustainability. Therefore, the circular economy is understood as a system of production and consumption with the most efficient use of resources, zero waste generation, and minimisation of external negative impacts on the environment (Moraga *et al.*, 2019).

Another aspect of solving the problem of sustainable development through the circular economy is the

restoration of natural ecosystems and the creation of new natural and anthropogenic ecosystems (Govindan & Hasanagic, 2018; Velenturf & Purnell, 2021). The need to improve the state of the environment is due to the significant impact of modern man-made civilisation on the environment. It should be agreed that man has significantly changed part of the earth's surface. However, these landscapes can also exist and develop over a period of time. For example, agricultural land, provided it is used rationally, can feed the population for hundreds of years without losing soil fertility. The global economic system is becoming more digital and globalised, which is alter-

ing how international marketing is structured. Traditional items are being replaced by digital goods and services. Comparatively speaking, e-commerce is growing at a far faster rate than traditional commercial practices. There is a great deal of opportunity for digital distribution to use sustainable development concepts. Digital distribution causes shifts in consumer behaviour and attitudes in the context of globalisation and the digitisation of the global economic system, with the goals of optimising consumption and balancing societal and environmental links. Figure 2 displays the increasing rate of Internet penetration from 2013 to 2023.

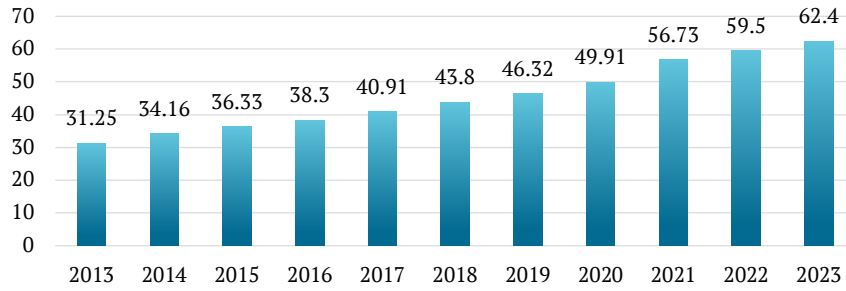


Figure 2. Internet penetration in the world, % of the world population

Source: made by the authors based on Individuals using the Internet (% of population) (2022), Internet penetration rate worldwide (2024)

Thus, it can be said that the synergistic effects of information flows have reached many different areas of society. The transformation of the concept of sustainable development has a significant impact on the transformation of international marketing and also contributes to the development of digital distribution in modern society (Brogi *et al.*, 2022). In turn, the globalisation of the world economy and digital distribution in the context of digitalisation have acquired significant digital content on the Internet. The increase in digital content serves to satisfy the population with intelligent products to achieve the goals

of sustainable development. At the same time, a new vision is being formed, based primarily on the principles of rational product consumption as well as finding ways to optimise relations between society and the environment. The circular economy is one of the strategies for accomplishing the objectives of sustainable development. The sensible use of resources is the primary characteristic of this economic development model. The rise of digital distribution, which was based on processes like globalisation and the digitisation of the international economic system, partially provided the groundwork for it (Fig. 3).

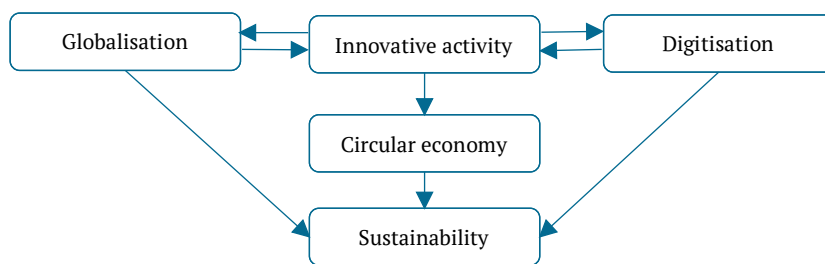


Figure 3. The impact of the circular economy on achieving sustainable development

Source: made by the authors

It is obvious that the development of the circular business model requires persistent support and stimulation from the state – a unified and systematic approach to re-orientation to the principle of circulation in the context

of ensuring sustainable development. This is evidenced by the main measures of the national regulatory policy of the largest countries in the world, aimed at stimulating the development of circular business models (Table 3).

Table 3. The main measures of the state regulatory policy to stimulate development circular economy

Business model	Characteristics of the event	Country
Circular suppliers	Preferential rates for loans	France
	Tax deductions	Netherlands

Table 3. Continued

Business model	Characteristics of the event	Country
Recovery and recycling of resources	Tax on waste collection and disposal	Great Britain, Germany
	Value-added tax (VAT) reduction for companies that use recycled raw materials	China
	Reduction of VAT on repair services of a certain group of goods (bicycles, clothes, etc.)	Sweden
Sharing platforms	Legal support for consumers of online services (Law on Electronic Commerce of the People's Republic of China)	China
	Development and dissemination of the map of circular initiatives (the list of enterprises participating in sharing is publicly available)	Norway
Extending the life cycle of the product	Direct financial support from grant funds	Scotland
Product as a service	Stimulation of giving consumers access to goods and services as users	Great Britain

Source: made by the authors

Thus, it can be concluded that one of the business models for ensuring the circular economy, which can be implemented with minimal costs, should be the model of “joint consumption” (“joint participation”, “sharing model”). This format has already become widespread in developed countries, for example, in the form of garage sales. With the development of technology and the emergence of various online platforms, the costs of providers and users have decreased significantly, which has led to increased coverage and additional growth in demand. Such platforms are already present not only in the segment of consumer goods that can be purchased, but also in services (Airbnb, BlaBlaCar, NeighborGoods, Uber) (Chen *et al.*, 2022; Shebanin *et al.*, 2022). In general, the sharing business model can be used to share knowledge, skills, production capacities, etc.

The restoration of resources not only helps the circular economy fulfil its second purpose, but it also promotes the advancement of information technology and the rise of the knowledge economy. The significance of the circular economy's growth for the accomplishment of the sustainable development goals is determined by the interplay of these many contributing elements. Because of its connections to globalisation and digitisation of the global economy, innovation and the expansion of digital distribution, and the activation of inventive activities, the circular economy can help accomplish the sustainable development goals. Many contemporary perspectives on the idea of a circular economy have developed throughout the years. The circular economy was born at the junction of the two sciences of ecology and economics. The circular economy has gradually transcended its boundaries, and with the development of the sharing economy, it has acquired a social component.

After conducting an analysis of the circular economy research, one should pay attention to how scientists considered this problem, and reveal their own point of view regarding the circular economy of sustainable development. D. Reike *et al.* (2018) believe that the transition from the traditional linear model of the economy is taking place to a closed-loop economy as a means of ensuring product processing, secondary use, and recovery. In the process of research, the team of authors C.J.C. Jabbour *et al.* (2019) identified a number of stimulating components of the circular economy. The authors point out that in order to eliminate barriers, a group of actors can leverage new

technology to influence changes in the legal, social, or economic spheres in a way that will help establish a circular economy. This will open up chances for cyclical processes. According to J. Haegglom & I. Budde (2020), every incentive element has a distinct effect on lowering obstacles and establishing a circular economy. Thus, for instance, the quality, scalability, and financial feasibility of the primary circular economy tactics are determined by product design.

Considering the obstacles to the implementation of the closed-loop economy, the author team G. Sucozhañay *et al.* (2022) noted that the system of indicators for evaluating the closed-loop economy can be divided into the following groups: political and economic indicators; social development; concern for the environment and depletion of resources; regulatory requirements; self-fulfilment market; and competition. It should be agreed that all these indicators can be reflected in the so-called logical matrix (frame) of the results of the implementation of a closed economy. It clearly shows the contributions, measures, and results and how they correlate with the goals (summaries) of the program. N. Tura *et al.* (2019) identify organisational factors related to the implementation of a common circular economy and sustainability (which may also be related to other organisational factors such as hierarchies), opportunities for value creation, skills, and employee skills.

After studying the scientific sources, a number of technical barriers were identified that prevent the implementation of the closed-loop economy. In particular, if there are technical difficulties in working with materials in a closed-loop economy, there is a technological gap, which is a lack of technical skills. Many authors, including K. Govindan & M. Hasanagic (2018) and C. Vinante *et al.* (2021), recognise that technological development is an important factor determining periodicity. But it is worth agreeing with the authors N. Drebot & I. Semehen (2019) and J. Vaupotič (2024), who believe that technologies and knowledge will facilitate the transition to cyclicity and allow enterprises to use them effectively. For example, information sharing platforms and digitisation can help in efficient planning and management of the circular economy, as well as in material tracking and product identification. Different methodology, sets of indicators, formulas, units of measurement, and calculation goals are used in the scientific literature by K. Govindan & M. Hasanagic (2018) and M. Varfolomeev & O. Churikanova (2020). Some tools are intended to support the process of selecting

indicators, while others aid in monitoring the company's operations, and still others represent the process of developing new products while taking the concepts of the closed-loop economy into consideration. To support the process is the aim. Research such as those of S. Goyal *et al.* (2021) attest to the fact that every mean has a unique structure and approaches the closed-loop economy from various angles.

The concept asserts that the process of forming a closed economy as a major occurrence in economic activity combines ecological and economic efficiency. Businesses may view the circular economy as a chance to distinguish their brand and business strategy, which will enhance value generation and product development. The reputation and image of businesses are impacted by the closed-loop economy since it is linked to their ability to satisfy their social and environmental responsibilities. The government's influence is the primary requirement for the closed-loop economy model to operate well. Financial incentives and administrative and legal compulsion are the two key items that it has recognised, which are basically opposites and may be utilised in many other areas. The most successful approach was found to be the situational application of the second technique and the dominance of the first strategy in state policy.

■ CONCLUSIONS

Although the idea of sustainable development has emerged as the primary theory guiding the long-term growth of civilisations, there are still major obstacles to putting the concept's tenets into practice. One way to meet the goals of sustainable development in connection with the processes of digitisation and globalisation of the global economy, the start of creative activities, and the expansion of digital distribution is through the rise of the circular economy. The goal of the circular economy, which stands in contrast to the conventional economic structure, is to enhance and rationalise resource usage. In addition to conceptually integrating with the ideas of sustainable development, the circular economy aims to reduce the adverse effects of human activities on the environment.

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The implementation of the circular economy model contributes to sustainable economic development. This model ensures the optimal use of resources, taking into account the needs of present and future generations, and is consistent with the UN definition of sustainable development. The pioneers in the development of the circular economy model are the Asian countries, especially China, and the European countries, where appropriate regulatory and legal frameworks have been created and national authorities are developing projects to stimulate the circular economy model together with companies. Thus, the circular economy is one of the fastest-growing contemporary inclusive economic models, based on the principles of social support, collective and responsible consumption and use of goods and services, and environmental care. These ideas make the circular economy inherently consistent with the idea of sustainable development. In summary, the world economy is becoming more digitalised and globalised, which means that sustainable development, economic efficiency, and environmental friendliness are all conditioned by the cyclical model.

The prospect of further research in this direction is the implementation of this stage of transformation in the digital economy. Having gone through all the stages of digital transformation, it is possible to systematically and harmoniously approach a successful organisation of transformation, which determines the key directions necessary for the implementation of digital processes in society. Further research will be aimed at studying one of the most pressing issues of circular economics: the formation and management of reverse flows, which are studied by reverse or reverse logistics, which can be understood as the processes of waste management of products at the end of their life cycle in order to reuse and reduce pressure on the environment, and save resources and energy.

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■ CONFLICT OF INTEREST

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Ландшафт і циркулярна економіка як механізм сталого розвитку в умовах глобалізації та цифровізації світової економіки

■ **Анотація.** Концепція циркулярної економіки стає центральним компонентом місцевої та регіональної економіки. Тому метою цього дослідження було виявити вплив ландшафтного розвитку та циркулярної економіки на досягнення цілей сталого розвитку в контексті глобалізації та цифровізації світової економічної системи. Системно-аналітичні методи використано для оцінки деталей структури та функціонування механізмів державного регулювання становлення і розвитку циркулярної економіки; категоріально-аналітичний для демонстрації теоретичних засад формування цілеспрямованої державної політики у сфері розвитку. Цифрова дистрибуція має великий потенціал у реалізації принципів сталого розвитку, зміні споживчої поведінки й світогляду в контексті глобалізації та цифровізації світової економічної системи. Досліджено, що виснаження природних ресурсів створює проблеми для майбутнього розвитку промисловості, якості життя та забезпечення населення світу матеріальними благами. Внаслідок нераціонального природокористування, зростання матеріаломісткості та неефективного ресурсозабезпечення відбувається погіршення екологічного стану, виснаження природних ресурсів, зниження ефективності діяльності підприємств, погіршення якості продукції. На основі проведеного аналізу зроблено висновок, що ідея сталого розвитку стала основною парадигмою суспільного розвитку в майбутньому, а одним із механізмів досягнення цих цілей є розвиток циркулярної економіки через її зв'язок із такими процесами, як глобалізація та діджиталізація світової економіки, стимулювання інноваційної активності та розвиток цифрової дистрибуції. Зроблено висновок, що це можна розглядати як один із механізмів досягнення цілей. Сформульовані положення, висновки та пропозиції поглиблюють теорію і практику розвитку економіки замкненого циклу, в чому полягає практичне значення одержаних результатів

■ **Ключові слова:** кругообіг ресурсів; місцева влада; інноваційна діяльність; цифрова дистрибуція; екологічний стан; економічний розвиток