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## **REGENERATIVE ECONOMY: PRINCIPLES AND PRACTICE OF IMPLEMENTATION**

*The article examines the content of the concept of regenerative economy. The author's vision of the relationship between the concepts of "circular economy" and "regenerative economy" is presented. The principles of regenerative economy are analyzed. It is proposed to develop a meaningful content of the principle of environmental friendliness and to conduct research on implementing the principles with the help of mechanisms of state influence. The practices of implementing the principles or regenerative economy are presented. The National Economic Strategy for the period until 2030 is analyzed and the implementation perspective is revealed.*

**Keywords:** circular economy, regenerative economy, economic principles, National Economic Strategy for the period until 2030.

*References:* 20

**Target setting.** The design and ideas of the regenerative economy emerged relatively recently, but at the same time are extremely promising and progressive. Since independence, the Ukrainian economy has had many problems (high unemployment and low salaries etc.), which have only intensified since the Russian Federation mass military invasion on the territory of Ukraine in February 2022

[1]. It is important to note that an indisputable argument in favor of the introduction of a regenerative economy is the call to solve the many challenges, and as one of its direct consequences - to increase the level of environmental protection on the territory of Ukraine. It is obvious that this approach of the regenerative economy will be of particular importance for Ukraine both at this stage of development and in the post-war period, because in addition to the standard environmental problems (a huge number of landfills and its associated lack of correct state regulation), there are also special problems, that arose or may arise in connection with a mass military invasion (disposal of the remains of military equipment or revival of soil fertility that is littered as a result of military actions).

The analysis of theoretical sources, the content of which was related to the study of regenerative economy, showed insufficient doctrinal development of this matter. The primary and extremely important challenge is the understanding and meaningful filling of the design of the regenerative economy the formation of a complex system of its features, which will allow to characterize the regenerative economy as a separate type of circular economy. Not only the development of its principles, but also measures of practical implementation depend on determining the place of regenerative economy in the system of types of circular economy.

**Actual scientific research and issues analysis.** The theoretical understanding of not only the principles of regenerative economy, but also its understanding in Ukrainian science and context is an understudied issue. For instance, in the monograph "Economics of uncertainty: a practical view of the problem" edited by V.I. Hrushko contains references only to the field of regenerative design, next to the results of research by scientists in such areas as industrial ecology, environmental efficiency, etc. [2, p. 10]. Many studies indirectly mention the regenerative economy within the framework of consideration of the circular economy (M. Geissdoerfer, P. Savaget, N.M.P. Boken, E.J. Hultink [4]; I.L. Tatomyr, L.G. Kvasnii [5]; N.V Trushkina [6]; O. Sysoiev [8]; N. Serbulova, E. Syvolapenko, S. Panosian [5], P. Morsetto [10] et.al.). In addition, the work of B.D. Fas, D.A. Fiscus, S.J. Goerner, A. Berea and R.E. Ulanowicz [13] should be considered extremely positively; researchers described the system of the regenerative economy principles. M. Dmytryshyn highlighted certain important aspects of the practice of implementing the circular economy both at the global level and on the example of Ukraine [18].

**Uninvestigated parts of general matters defining.** According to the topic of the publication, several challenges can be singled out, which are currently not fully explored in the current context: - understanding of the regenerative economy and its relationship with the circular economy; - formation of the system of regenerative economy principles, its consideration and meaningful filling; - development of measures aimed at practical implementation of concepts and ideas of regenerative economy.

**The research objective.** The task of this publication is a critical analysis of the meaningful content of the understanding of the regenerative economy on the basis of available doctrinal research, its principles and practice of implementation, as well as an outline of general challenges in this direction that will require further consideration.

**The statement of basic materials.**

1. *Some aspects of the problem of theoretical understanding and meaningful filling of the concept of regenerative economy in modern economic science.*

The theoretical understanding the principles of regenerative economy is an understudied issue in Ukrainian economic science, therefore foreign sources were studied in the majority. The concept of regenerative design developed by J. T. Lyle. J. T. Lyle based his theory on the understanding of processes that can be reused in all systems their own energy and materials [3, p. 10]. At the same time, J. T. Lyle indicates that the demand of society must be satisfied within the limits of the nature possibilities [3, p. 57].

The approach of M. Geissdoerfer, P. Savaget, N.M.P. Boken and E.J. Hultink is also interesting. M. Geissdoerfer, P. Savaget, N.M.P. Boken and E.J. Hultink understands the circular economy through the prism of the regenerative system category, which is characterized by the minimization of resource consumption and losses, emissions and energy leaks due to optimisation, closing and narrowing material and energy cycles [4, p. 758]. M. Geissdoerfer, P. Savaget, N.M.P. Boken and E.J. Hultink emphasize the fact that under the conditions of the circular economy functioning of an all-encompassing, inclusive nature, its growth should be ensured at the expense of human capital, and not at the expense of natural resources extraction [4, p. 758].

In general, such constructions as "regenerative production system" and "regenerative closed system" take place in the systematization of approaches to the developers of the concept of "circular economy", proposed by representatives of various scientific schools [5, p. 12].

The publication, written by N.V. Trushkina, dedicated to issues of the concept, evolution of development, barriers, problems and prospects of the circular economy, refers to a closed cycle of the economy, which is a regenerative type of economy. The purpose of such type of economy is to preserve the vast majority of the value of products, components and their materials. During the examining of the regenerative type of economy, N.V. Trushkina is guided by the research of Oxford University experts, based on a series of interviews with participants of the Platform for Accelerating the Circular Economy (PACE; 2019) [6, p. 10]. Trushkina emphasizes that under the regenerative type of economy, the growth of components and materials of valuable products should not be stimulated and should not depend on the use of limited resources. In general, this type of economy characterizes a new trajectory of society's development on the way to sustainability [6, p. 12].

O. Sysoiev uses the doctrinal construction of "regenerative ecologically clean production and consumption" while characterizing the circular economy to understand economic activity, which aim is energy saving [8, p. 50]. At the same time, in the work of O. Sysoiev, there is a reference to the concept of the circular economy, which was described by Stachel and Redai-Mulvey in the 1980s as an economy with a closed cycle, in which not only recycling, but also the reuse and regeneration of products are necessary [8, p. 12].

N. Serbulova, E. Syvolapenko and S. Panosian formed a scientific approach to understanding the category of "circular economy" as a restorative or regenerative production system [5, p. 11].

P. Morsetto raises an interesting issue about whether it is appropriate to be guided by the concept of "regenerative" when it comes to the circular economy [10, p. 764].

The authors are convinced that during studying the correlation between the concepts of "circular economy" and "regenerative economy", the following points should be taken into account. (i) The content of the circular economy construction consists, first of all, in the fact that such type of economy is the type of economy of the so-called closed cycle. (ii) The regenerative economy certainly belongs to the closed cycle economy, but its main goal is the regeneration of capital funds or resources. The authors are convinced, that such approach allows considering the regenerative economy as a subtype of the circular economy. That point of view will be important for building a system of the regenerative economy principles, which will be discussed further. (iii) The correlation between the concepts of "circular economy" and "regenerative economy" requires further scientific research.

In support of their own position outlined above, the authors would like to highlight the point of view of M. McElligott. M. McElligott not only supports the concept of the non-identity of the terms "circular economy" and "regenerative economy", but is also convinced that the circular economy is a transitional stage to the formation of a regenerative economy ultimately [11].

## *2. Principles of regenerative economy.*

Before investigating and conducting a critical analysis of the available theoretical sources regarding the principles of regenerative economy, it is worth noting what exactly it is understood by the theoretical construction "principle of economy".

This category has a tangential character to the concept of "economic law", because like economic laws, economic principles reflect the phenomena of the economy, which are interconnected. At the same time, economic principles represent theoretical generalizations, the content of which are certain assumptions, averaging, which aim is to reflect the general trends in the development of the economic system. Unlike economic laws, economic principles are not so stable and not so obligatory. In general, economic principles, like principles in any field of science, represent fundamental views and provisions that act as the basis for

building thorough categories of this science, and consequently they are not binding to any requirement [11, p. 18].

B.D. Fas, D.A. Fiscus, S.J. Goerner, A. Berea and R.E. Ulanowicz formed a system of ten fundamental principles of regenerative economy. Such system consists of next principles:

- support of reliable interscale circulation of flows of a critical nature, such as energy, information, resources and money;
- regenerative re-investment;
- use of reliable resources;
- obtaining reasonable results;
- maintaining a healthy balance in the field of integration of small, medium and large organizations;
- maintain a balance between sustainability and efficiency;
- introduction of sufficient diversity support;
- development of mutually beneficial relations and clarification of reasons of general importance;
- activity should be constructive, and excessively extractive and speculative processes should be limited;
- it is necessary to introduce effective, collective learning with adaptive character.

Returning to the standard understanding of the principles of any economy, not only regenerative, the authors would like to make the following remarks.

It is necessary to investigate what system of principles is common both to the circular economy and to the regenerative economy as its subtype. It is worth talking about the interdisciplinary principles of the regenerative economy, which are common to other subtypes of the circular economy. Thus, the authors propose the following system of principles of the regenerative economy:

- general principles (those that are common both for the regenerative economy and the circular economy);
- interdisciplinary principles (principles that are common for the regenerative economy and other subtypes of the circular economy);
- special principles (principles characterizing exclusively regenerative economy).

The meaningful filling of such principles requires further scientific research and can serve as a basis for theoretical discussions.

Regarding the system of principles of regenerative economy, presented by B.D. Fas, D.A. Fiscus, S.J. Goerner, A. Berea and R.E. Ulanowicz, it is obvious that it has a special importance: it is necessary to distinguish between the principles of building the economy, the principles of the functioning of the economy, the principles of obtaining the results of economic activity, as well as the principles of forming the foundation for the introduction of a regenerative economy.

According to this approach, the authors propose to share the principles of regenerative economy described by B.D. Fas, D.A. Fiscus, S.J. Goerner, A. Berea and R.E. Ulanowicz, as follows:

- principles of building a regenerative economy (regenerative re-investment; use of reliable resources; maintaining a healthy balance in the field of integration of small, medium and large organizations; introduction of sufficient diversity support);

- the principles of the functioning of the regenerative economy (support of reliable interscale circulation of flows of a critical nature, such as energy, information, resources and money; development of mutually beneficial relations and clarification of reasons of general importance; activity should be constructive, and excessively extractive and speculative processes should be limited; maintain a balance between sustainability and efficiency);

- principles of obtaining the results of regenerative economic activity (obtaining reasonable results);

- the principles of forming the foundation for the introduction of a regenerative economy (it is necessary to introduce effective, collective learning with adaptive character).

However, under the authors' perspective, the system of principles of regenerative economy, formed by B.D. Fas, D.A. Fiscus, S.J. Goerner, A. Berea and R.E. Ulanowicz, can be, subsequently improved - it must be completed by the principle of environmental friendliness as well as it is also desirable to develop the principles of implementing the regenerative economy into practice by using the instruments of the state influence at the doctrinal level.

Currently, it is worth noting that the principles of the regenerative economy are being implemented by multiple actors through research projects (European, National or regional funded) at different scope levels. An example of such an institution that successfully implements regenerative practices is the Biodiversity, Ecology and Environmental and Food Technology Technological Center - BETA Technological Center of the University of Vic-Central University of Catalonia (UVic-UCC, Spain) [14; 15]. This Technological Center, through the European-funded research project RE:GEN-U (ERASMUS+ KA2 research & innovation programme; grant agreement №101087610: 2023-2026) , aims at implementing the principles of regenerative economy and increasing the potential of higher education institutions in strengthening their influence in this direction [16]. In recent decades, higher education institutions (HEIs) have stimulated economic growth through research, technology commercialization, and development of scientific potential.

The RE:GEN-U project addresses the need for innovation in the universities by definition, implementation and development of prospective educational approaches that have the high potential to establish the foundation for a "green" transition through education and training practices.

The main goals of the REGEN-U project are to provide HEIs' professionals, researchers and students with the knowledge, necessary skills, recognition and attitudes of the regenerative economy; the proactive involvement of universities, enterprises, government and society in focusing on environmental policy; expanding the capabilities of university staff and students in the transfer of knowledge and innovative ideas into implemented regenerative solutions [17].

*3. Assessment of the current state of the regenerative economy implementation practice in the Ukrainian economic space.*

Examples of circular economy implementation are described by M. Dmytryshyn. Such practices took place abroad and in Ukraine. M. Dmytryshyn reminds of the experience of H. Nzemudjo, which was implemented in West Africa, starting in 1985. This experience was positive - H. Nzemujo implemented the main ideas of the circular economy in practice, which made possible solution to such problems as food shortages, unsanitary conditions, the spread of diseases and unemployment, which are inherent in African regions [18, p. 122]. Another positive experience of introducing the circular economy model belongs to G. Pauli and took place during the establishment of rational coffee production [19].

M. Dmytryshyn mentions the IMMER Group factory, which owns a recuperation station of flexible plastic packaging, as an example of a Ukrainian enterprise that is guided by the principles of circular economy in its activities [18, p. 124]. In the context of the experience of implementing the principles of the circular economy, M. Dmytryshyn also speaks favorably of the activities of the public organization "Promprilad. Renovation", which takes place in Ivano-Frankivsk. The Ukrainian researcher is convinced that in many areas this organization is ahead of large industrial centers.

The authors would like to underline that in the National economic strategy (NES-2030) for the period until 2030, approved by the Resolution of the Cabinet of Ministers of Ukraine, dated March 3, 2021 № 179 the development of the circular economy is provided as one of the guidelines, principles and values of the economic policy of Ukraine [18]. NES-2030 includes not only such a strategic goal as "stimulating the development of the circular economy", but also describes a number of tasks designed to implement this goal in practice. Among such tasks, the Strategy separately notes, for example, stimulation of reducing the volume of waste generation, simplification of the procedure for carrying out operations with scrap metal, formation of a circular economy policy, introduction of a system of extended producer responsibility [19]. The authors are convinced, that "circular economy policy formation" is, obviously, a rather broad concept and close to the term "stimulation of circular economy development".

The enumeration of tasks that, in fact, are designed to stimulate the development of the circular economy (such as the introduction of a system of extended producer responsibility and the implementation of a set of measures for the commercial development of industrial waste) indicates a violation of the formal and

logical method of presenting the material, because the tasks of a special nature, which detail the general task, in the NES-2030 are laid out next to each other.

Returning to the question of the practice of implementing a regenerative economy, the authors paid attention to another important aspect of the NES-2030, namely, "increasing resource efficiency", that is indicated under number 5 in the list of ways to achieve the strategic goal [18]. This provision is extremely important, because it confirms the position, that the authors stated at the beginning of the work - the concepts of "circular economy" and "regenerative economy" are related, but not identical. "Increasing resource efficiency" can be the theoretical meaning of the doctrinal understanding of the "regenerative economy" that will allow us to distinguish the concepts, which were considered in this article.

At the same time, it is worth to note that the concept of "regenerative economy" is not mentioned in the NES-2030.

**Conclusions.** The analysis, that was carried out in this article, provides a broad basis for further scientific research in the field of economics. The first challenge scientists should pay attention to is to fundamentally and comprehensively research how the concepts of "circular economy" and "regenerative economy" relate to each other. Under authors' opinion, it is obvious that these concepts are related to each other as general and special.

At the same time, following the formal-logical method of researching theoretical constructions, it is obvious that with such an approach it is important to:

- clearly outline what other special types of economy, in addition to the regenerative one, the circular economy includes;
- to investigate what should be the defining characteristics of the regenerative economy, which will allow it to be distinguished from other types of circular economy and, in general, may serve as a basis for distinguishing the regenerative economy as a separate type of circular economy;
- to develop a system of signs (characteristics) of regenerative economy of general and special content.

As for the principles of the regenerative economy, here, according to the authors' opinion, it is necessary to finalize the existing scientific research. The approach to dividing the principles of the regenerative economy was highlighted in the work, but it is necessary to pay attention to at least two more aspects: (i) The development of a meaningful content of the so-called ecological principle of the regenerative economy and (ii) The study of what should be the principles of implementing the regenerative economy into practice by using the instruments of the state influence.

To summarize, the presented material on the practice of implementing the regenerative economy, the authors can single out the following points:

- the analysis of the available sources showed that, mainly, when it comes to the implementation of the regenerative economy, it means a circular economy;

- a progressive moment is the indication of the need to introduce a circular economy at the level of the National economic strategy for the period until 2030.

At the same time, the implementation of the regenerative economy main ideas into practice is extremely dynamic, as it will make possible to solve a wide range of economic problems that have been arising in the Ukrainian society for a long time (from waste management to unemployment).

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**РЕГЕНЕРАТИВНА ЕКОНОМІКА:  
ПРИНЦИПИ ТА ПРАКТИКА ВПРОВАДЖЕННЯ**

*Ідеї регенеративної економіки є надзвичайно перспективними та прогресивними. Безперечним аргументом на користь впровадження регенеративної економіки є покликання вирішення проблем управління з відходами, і як наслідок - підвищення рівня екологічної захищеності населення не лише на території України, а й на світовому рівні. Очевидно, що такий підхід регенеративної економіки для України як на даному етапі розвитку, так і в повоєнний період матиме особливе значення.*

*Досліджено проблеми теоретичного осмислення та змістовного наповнення поняття регенеративної економіки в сучасній економічній науці. Представлено авторське бачення співвідношення понять "циркулярна економіка" та "регенеративна економіка. Аргументовано, що поняття співвідносяться між собою як загальне та спеціальне.*

*Проаналізовано принципи регенеративної економіки. Поділ принципів регенеративної економіки на: принципи побудови, принципи функціонування, принципи отримання результатів, принципи формування підґрунтя для запровадження регенеративної економіки; рекомендовано доповнити. Запропоновано розроблення змістовного наповнення принципу екологічності та необхідності проведення досліджень щодо принципів впровадження регенеративної економіки в практику за допомогою механізмів державного впливу. Наведено практики впровадження регенеративної економіки. Виявлено переваги та недоліки чинної Національної економічної стратегії на період до 2030 року. Серед завдань стратегії виокремлено стимулювання скорочення обсягів утворення відходів та формування політики циркулярної економіки, запровадження системи розширеної відповідальності виробника.*

*Доведено перспективність впровадження у практику основних ідей регенеративної економіки для вирішення широкого спектру економічних проблем, що постають перед українським суспільством протягом тривалого часу.*

**Ключові слова:** циркулярна економіка, регенеративна економіка, принципи економіки, Національна економічна стратегія на період до 2030 року.

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