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**THE CONCEPT OF CIRCULAR ECONOMY IN ENSURING FOOD SECURITY (REGIONAL ASPECT)**

**КОНЦЕПЦІЯ ЦИРКУЛЯРНОЇ ЕКОНОМІКИ В ЗАБЕЗПЕЧЕННІ ПРОДОВОЛЬЧОЇ БЕЗПЕКИ (РЕГІОНАЛЬНИЙ АСПЕКТ)**

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***Abstract.** The modern architecture of the world economic system with its inherent threats and challenges requires the search for alternative models for ensuring sustainable development. The practical implementation of certain postulates of the circular economy concept creates additional mechanisms for ensuring food security. The food redistribution mechanism, which is widely used by the countries of the Scandinavian region, is a proven tool that implements the main principles of the circular economy - recovery and rational consumption. The effectiveness of such state policy instruments as state intervention, regulation of the labor market, coordination of environmental protection activities, active state policy in the field of health care, ecological production and responsible consumption allows to obtain a complex socio-ecological-economic effect. This is a unique regional concept of the circular economy model, which has proven its effectiveness in practice.*

***Key words:** circular economy, food security, sustainable development, food redistribution, responsible consumption.*

***Анотація.** Сучасна архітектура світогосподарської системи з властивими їй загрозами та викликами вимагає пошуку альтернативних моделей забезпечення сталого розвитку. Практична реалізація окремих постулатів концепції циркулярної економіки створює додаткові механізми забезпечення продовольчої безпеки. Механізм перерозподілу продуктів харчування, який широко використовується країнами Скандинавського регіону, є випробуваним інструментом, що реалізує основні принципи циркулярної економіки – відновлення та раціональне споживання. Ефективність таких інструментів державної політики, як державне втручання, регулювання ринку праці, координація природоохоронної діяльності, активна державна політика в сфері охорони здоров'я, екологічного виробництва та відповідального споживання дозволяє отримати комплексний соціально-екологічно-економічний ефект. Це є своєрідною регіональною концепцією моделі циркулярної економіки, яка на практиці довела свою ефективність.*

***Ключові слова:** циркулярна економіка, продовольча безпека, сталий розвиток,*

*перерозподіл продуктів харчування, відповідальне споживання.*

### **Introduction.**

Social risks, environmental problems, climate change, income imbalance, food insecurity, uneven economic development of individual countries and regions in the general world economic system - this is far from a complete list of challenges that must be considered in the process of building an economic model and state socio-economic policy. The circular economy is an alternative to the traditional classical economic model, which involves restoration, responsible consumption, saving resources, and ecologically responsible production. Most of the mechanisms and tools for implementing the circular economy concept have long been implemented in the model of general welfare and sustainable development, which are implemented within the framework of complex strategies of socio-economic development of the leading highly developed countries of the world. The first place in the development of the toolkit of such models is occupied by the countries of the Scandinavian region, which managed to obtain simultaneously both ecological and social effects against the background of economic development. One of the key mechanisms of the practical implementation of the circular economy model by the countries of this region is the redistribution of food products.

**The purpose of the article** is to analyze the legislative framework and the main mechanisms for the implementation of individual tools of the circular economy model; to determine the characteristic features of the model of sustainable development, which are obtained because of the practical implementation of these concepts, in particular aspects of food security, within the framework of the regional aspect.

### **Literature review.**

Current issues of combining and implementing the concepts of sustainable development and circular economy are discussed in the works of M. Geissdoerfer (2017), M. Hoffman (2022), M. Lewandowki (2016), J. Korhonen (2018), J. Kirchherr (2018), J. Scott (2015), P. Planing (2015), S. Paulyuk (2018), J. Elkington (2018), and others. Gephart J. et al (2016), Porkka M. et al. (2013), Kumm M. (2020) paid attention to the issue of food security and methods of ensuring it. Social aspects of such mechanisms of influence as redistribution of food products and responsible consumption are considered in the works of F. von Hayek (1944), M. Friedman (1970), E. Roth (2023), J. Tirole (2018), A. Filipenko (2017). Models of general welfare with their specific features of practical implementation are actively researched by leading organizations of regional development and are the focus of specialized commissions and committees of the EU, which conduct global research to find alternative ways of development.

### **Main results of the research.**

The redistribution of food products is one of the components of an active socio-economic state policy of provision, a guarantee of the implementation of the main principles of the preventive model of general well-being. Its most effective mechanism, widespread in all European countries, is the functioning of food banks, whose activities are coordinated by the Federation of European Food Banks. Of the countries of the Scandinavian region, only Denmark and Norway are members of the Federation.

However, all countries in the region have developed national strategies to reduce food waste, some of which are aimed at overcoming differences in the functioning of food supply chains. This is a characteristic feature of the Scandinavian model of management of food redistribution processes, which is considered rather to ensure the efficient use of excess resources (the "society without waste" model (Depedri 2012)), than exclusively as the construction of a perfect system for providing the population with food products.

The redistribution of food stocks is perceived as a win-win scenario for the participants in the process, which ensures the simultaneous efficient use of surplus resources, processing of food waste, establishment of food redistribution chains, support of socially vulnerable population groups, overcoming structural poverty, obtaining additional economic effects, etc.

Most measures implemented by the countries of the region in this area can be defined as food donation, which involves both sponsorship and redistribution of products that have lost their market value. Redistribution within consumption chains from the producer to the final consumer, in turn, can be carried out either through redistribution centers, such as food banks (usually applied at the general

state level), or directly to consumers in the form of charitable organizations (local level of management).

It is fundamental for the Scandinavian region to implement this system of measures not exclusively in the sphere of social, but mainly social-ecological direction. The differences between these approaches are clearly illustrated by the system of food redistribution as a component of active social and economic state policy (Launay, 2007).

An important task of the Council of Ministers of the Scandinavian region is the development of systems for tracking and determining the amount of food products to improve the existing mechanisms for their redistribution and disposal of food waste. The urgent priority is to improve the existing means of coordination and regulation of activities and relationships between all participants in the food redistribution process: manufacturers, retail and wholesale trading partners, food banks and others.

Within the framework of the European Union, there is a single harmonized approach to the regulation of the food redistribution system. The harmonized EU law on food safety and standardization (No. 178/2002) was supplemented by additional rules on food hygiene (No. 852/2004 and 853/2004), control measures for their compliance (No. 882/2004), regulation of the activities of food manufacturers industry (No. 854/2004). In this context, the redistribution of food products is considered a distribution activity, and its regulation applies to all operators and counterparties of this process.

However, the peculiarities of the interpretation of these methods within the framework of the national legislation of the countries of the Scandinavian region have several differences. A characteristic feature is the stricter application of rules developed in the EU within the region in comparison with other EU countries.

According to regional legislation, all counterparties involved in the processes of food redistribution and provision of services in this field are considered food industry operators. In Norway, however, the regulatory procedure is somewhat simplified, as the national food bank and national charities providing social services in the field of food provision are additionally defined as end consumers.

A distinctive feature of the regional system of regulating the redistribution of food products among all its participants is the national regimes of phased control. In accordance with EU Regulation (No. 178/2002), the activities of all food industry operators as a priority within the preventive model of general welfare are subject to control at all stages of implementation. In Denmark, Finland and Sweden, all food banks and charities are subject to such control. In Denmark, the main means of control is excessive detailing of all information about manufacturers, product composition, directions of their redistribution, sources of financing, etc. In Finland, where the activities of food banks are not centralized, but locally, which contributes to the shortening of supply chains and more prompt satisfaction of urgent public needs, the main requirement is exclusively the registration of all donor operations in this area. Thus, the administrative burden is reduced, and the redistribution system is improved.

Control measures in the field of food redistribution are a key aspect of the functioning of the preventive model of general welfare. Distinctive for the countries of the Scandinavian region are the issues of financing the implementation of these mechanisms. Surely, control of food industry operators in Norway is completely free; in Denmark - initial control is free, while in-depth control is carried out at the expense of retail operators; in Finland, even charitable organizations and food banks cover the cost of control measures, but such control is only possible if there are strong prerequisites for their application.

A separate aspect of the regulation of this area in EU countries is the exemption of food industry operators from paying value added tax, which is regulated by EU tax legislation. According to the regulations in force in individual countries, food products going for recycling are not subject to VAT, while food products that go as part of sponsorship and donor programs are taxed. This situation leads to the fact that it is more profitable for producers to dispose of the products instead of donating them and bringing them through food banks and other organizations to the end consumers.

The rather strict interpretation of this directive in Sweden and Denmark prevents the redistribution of food among all stakeholders, while the more flexible policy of Finland and Norway allows the successful implementation of the policy of avoiding food waste and satisfying public services through the redistribution of food as an element of an active socio-economic policy state.

In each country of the Scandinavian region, the coordination of this area is carried out under the auspices of specialized organizations. Thus, in Finland, the main institution is the Finnish Food Safety Authority, the main purpose of which is to reduce food waste and safely redistribute food. In Denmark (Danish Veterinary and Food Administration), an initiative is being implemented to limit food waste in the retail and hospitality sectors by transferring surplus products to food banks or charities. In Denmark, a unique online platform has been developed, which allows extremely quickly to display the surplus of products, which necessarily meet the norms of safety of consumption, and to redistribute it between interested donor organizations. Thus, proper control of food safety is satisfied, food waste is reduced, and targeted needs of society are met.

The Norwegian government places the main emphasis on the ecological component of the food redistribution system. Thus, the national industry is actively involved in the processes of environmental protection by strengthening the responsibility of producers, regarding the processing of packaging materials (glass, plastic, metal, paper, cardboard), the introduction of the use of renewable energy sources, etc.

Given these differences, full harmonization of the legal framework and the practice of using specific mechanisms within the region is currently impossible. The supremacy of the principle of reducing food waste through the redistribution of food products remains common, the social effect of which has a secondary, in this case, effect.

Although official statistics indicate the need to use food redistribution programs specifically within the framework of social security (even with a steady decrease, the share of the population in need of assistance and social protection is still quite large: Sweden - 3.9%, Finland - 6.7 %, Denmark – 3.6%, Norway – 3.6% of the population) (Jeffrey 2016).

In general, the countries of the region are moving in the direction of the transition to a circular economy model common to the entire EU (EU Circular Economy Package, 2015). To ensure sustainable development within the framework of the concept of a circular economy, a 50% reduction in food waste by 2030 is expected, as well as the implementation of the most successful practices of coordinating the redistribution of food products, proposed by a specialized working group of experts from most EU countries. Denmark and Norway are members of the working group, actively involved in these processes, representing the strategy of reforming this area within the framework of the region.

Currently, there is no unified regional strategy or even an approach to the functional definition of the main subjects of food redistribution. The low social efficiency compared to the ecological management system of food redistribution and food waste in the Nordic region compared to other EU countries is explained by the rather short history of existence (the first one was created and registered in Copenhagen in 2009) and functioning of national food banks and the perfect social security system of these countries, which does not require additional tools of influence.

The main sources of funding for food banks are: state funding of banks that provide social services to certain vulnerable segments of the population (however, such funding is often provided in the form of non-monetary assistance or has a one-time project nature, that is, it is low liquid and unstable); redistribution of profits received from other spheres of activity, if the food bank carries out additional activities, in addition to the provision of social services; paid provision of additional logistics services to subjects of the food industry; volunteer and sponsorship deductions.

Social work is usually the prerogative of state funding and activities of charitable organizations. However, the redistribution of food products is currently not only of a social nature, but also a service provided to the subjects of the food industry and contributes to the reduction of their costs for food waste management. It is the reduction of costs for disposal, incineration or anaerobic digestion that is the reason for the free transfer of food products to end consumers through donor organizations and/or the financing of food banks and charitable donor organizations by paying for the logistics services provided by them for the redistribution of products, the cost of which is usually much lower than cost of waste management.

For effective social integration of food banks, it is necessary to coordinate the participation of system operators at the national, regional, and local levels. At the same time, the food banks themselves, such as, for example, foodbanks in Denmark, perform the function of a single platform based on which charities, organizations receiving aid, producers and end users of social services interact. The main directions of this cooperation and interaction are: exchange by experience; development of common guiding principles of activities of donor organizations; minimizing the costs of processes related to the redistribution of food products by improving communication networks in order to accelerate the exchange of information and to balance supply and demand as quickly as possible; optimization of the formation and use of the resource base through exchange and mutual substitution (for example, joint use of warehouses or vehicles); implementation of the principle of social partnership with the aim of comprehensive involvement of state authorities in these processes in general and the formation of a perfect legislative framework for the regulation of the redistribution process in particular.

Logistics is usually carried out using a variety of IT systems, which allows to increase the efficiency of redistribution (for example, Foodcloud in Ireland and krøssmad.dk in Denmark).

Recently, in the Scandinavian region, as well as in some other EU countries, the following system of tripartism has become widespread, in which the central food bank performs a monitoring function rather than redistributes. Thus, within the framework of the tripartite agreement between the food bank, donor organizations and food producers, cooperation is carried out through the main coordination center - the food bank, which acts as a guarantor of quality, while the final redistribution is carried out mainly by charitable organizations. In addition, the food bank provides administration, staffing (recruitment, training) and accelerates redistribution processes by coordinating applications and orders from counterparties. That is, in addition to performing exclusively logistical functions, food banks as the main subjects of the redistribution process act as system operators. A similar organizational structure is used by such banks as Maistobankas (Lithuania), Toidupank (Estonia) and others.

As an alternative way of development, such a system operator can be formed on the initiative and with the active participation of other agents of the food industry, in particular manufacturers and/or trade networks. Currently, the concept of extended producer responsibility is actively spreading in Norway, which provides for responsible waste management, the process of redistribution of food products is recognized as an effective mechanism for preventing its occurrence at the legislative level.

Inviolable conditions for effective redistribution should be the reliability of supply chains, quality guarantees and confidence in the intended purpose of such aid. The long-term implementation of these projects is ensured by the interest of all parties in the process, and especially business partners, in participating, and most importantly, to provide financing. Such interest is ensured by the presence of benefits and incentives that participants receive as a result. In particular, the donors of the food bank fødemøBanken, companies such as ARLA, Aarstiderne and Irma Online, form their own social profile (social sustainability, corporate social responsibility, social partnership), the economic effects of which fully compensate for the expenses incurred in the process of participating in the redistribution of food.

The concept of sustainability is key for most participants in the process, which embodies the social and environmental benefits of its implementation. However, it is extremely important to uphold the prerogative of the social aspect over the environmental aspect. In addition, the social orientation is primary, determining in the process of food redistribution, and the environmental effects and economic benefits that participants receive because of waste management as one of the main methods of redistribution are concomitant positive effects.

Many charitable organizations around the world are involved in the processes of food redistribution to provide additional social services free of charge, meet the needs of the most vulnerable population groups, and implement social integration of business processes. The most important aspect of their immediate activity is the search for sources of financing and their involvement on a long-term basis. Direct redistribution, perfect coordination, establishment of logistics networks, provided there is an adequate amount of financial and material resources, are the

key to the successful functioning of the system in general and the maximization of the obtained social effects.

The issue of funding sources and methods remains controversial. The choice of a redistribution model and its active participants depends on several factors and is not unambiguous. Thus, the state authorities should be involved in this process in the process of fulfilling their direct functional duties of social security of the population. Business structures, in turn, are involved in this process because of tax preferences and subsidies, which stimulates the activity of their positions and participation. However, the participation of business, in particular food producers, although it will increase the volume of their participation in kind in the redistribution process itself, it will not provide the necessary funding to food banks, which need funds to support the logistics networks of redistribution (the movement of goods from the donor to the final consumer), but will also reduce the amount of deductions to the budget and extrabudgetary funds as a result of the reduction of the tax base or the provision of tax benefits and preferences to donors, which will negatively affect the implementation of other social protection programs designed as part of the socially oriented state economic policy.

Sustainable business models with sufficient funding can be achieved because of negotiations between donors and state authorities to find the optimal structure of redistribution of expenses and areas of participation in the process. It is expected that the donor companies will receive maximum benefits from this process (economic effects, social responsibility, environmental responsibility, reduction of disposal costs, subsidies, tax benefits, etc.). Moreover, under the condition of the functioning of an effective logistics system used by food banks in the process of redistribution, the volume of such effects will increase. That is why they are interested in increasing the amount of funding.

Under such conditions, even participation in the redistribution process itself will become an element of the competitive advantages of companies on the market, and participation in projects will be carried out on a competitive basis.

The implementation of such a policy will allow us to optimize the existing compensation models. Significant logistics expenses for the maintenance of additional warehouses, storage, disposal, etc. are redistributed from retail chains and production facilities to food banks or other entities that perform certain roles in the process of redistribution. Currently, this scenario of behavior is more acceptable for business, since, in addition to more economically efficient actions (in particular, the redistribution tool is less expensive than alternatives, for example, the production of biogas or animal feed), companies receive several of the above advantages, and society receives social services on free of charge and ecological effect.

### **Conclusion**

The Scandinavian countries are a kind of bridgehead, a base for the development and implementation of the basic principles of the circular economy.

The existing dissonance of the practical implementation of certain provisions that exists within the region once again clearly demonstrates the need for national coloring of certain models of state social and economic policy, sustainable development, food security, etc. Food redistribution along with long-term training, a flexible taxation system, reforming the classical health care system and implementing a comprehensive approach to social security and protection has become an effective mechanism for implementing this model in practice. A characteristic feature of the practice within the Scandinavian region is the combination of the social and ecological components of the food redistribution process, which ensures the sustainable development of the region.

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