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Practical study of the implementation of circular economy at agricultural enterprises of Ukraine

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Abstract. Given the role of the agricultural sector in the development of the Ukrainian economy, it is important to find methods to improve the efficiency of its operation. Since one of them is the introduction of a circular economy, the study of cases of its application in the country is relevant. The purpose of the study was to show an example of the implementation of this concept in Ukraine, depicting the advantages and disadvantages of its application. The main research methods were analysis, comparison, and forecasting. The most significant example of implementing the principles of circular economics at the enterprise, namely the company Myronivsky Hliboproduct, was evaluated. It was shown that the company's approach is based on processing waste into biogas and using it as energy. This process not only helps to avoid increasing CO_2 emissions into the atmosphere, but also makes much more efficient use of the available resources. In addition, the features water recycling and existing trends in this area were described. Special attention was paid to the difficulties that the company faced during the start of the full-scale Russian invasion in 2022, and what actions were taken to improve the situation. Conclusions were also drawn about the likely opportunities for the company to achieve its goals in the context of the circular economy, considering current trends in the development of Ukraine. The practical value of the study lies in its usefulness for developing recommendations for enterprises to implement the concept of a circular economy. In addition, data from the study can be used by state representatives to improve the effectiveness of policy implementation in the agricultural sector

Keywords: biogas; water resources; finance; public administration; sustainable development

INTRODUCTION

Circular economics is a management concept that is developed to reduce waste and maximise resource efficiency (Barros *et al.*, 2020; Morseletto, 2020). In a traditional (linear) economy, production, use and emissions are sequential stages, while in a circular economy, a closed loop is formed in which resources are used more efficiently and waste is reduced or completely recycled for use in a new production cycle. This allows achieving

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some of the main advantages, namely, the possibility of long-term use of resources (saving them), increasing the environmental friendliness of production. However, the use of this method has its drawbacks: despite the possibility of saving money in the long term, at the initial stage, the company is forced to invest in technology, equipment purchase and training of qualified employees. This leads to the fact that not all companies are able and willing to apply such principles (Mehmood *et al.*, 2021; Corvellec *et al.*, 2022). Thus, the study of cases of implementation of this concept by companies remains relevant, especially in the practice of Ukrainian companies in the agricultural sector, because this area is the most promising for using this concept.

A significant number of researchers have investigated the environmental component of development in Ukraine as a whole. Thus, H. Zelinska *et al.* (2022) examined innovative features of the country's development, including in the context of sustainable development. Researchers paid considerable attention to the fact that innovative technologies should help achieve the principles of this concept, but almost did not provide clear examples of their use. The use of digital technologies in accounting at livestock enterprises was investigated by M. Misiuk & M. Zakhodym (2023). They described the importance of introducing digitalisation in accounting to increase the efficiency of enterprises and, in particular, improve their condition in the context of achieving the sustainable development goals. A. Berxolli *et al.* (2023) investigated innovations in Ukrainian agriculture to mitigate the impact of war. Although the proposals can improve the efficiency of agricultural enterprises, even ensuring their more sustainable development, it is only the beginning of this extensive process. Implementation of the concept of circular economy in the context of regions on the example of the Kharkiv region was studied by S. Strapchuk & O. Mykolenko (2021). Researchers have identified new approaches to production and consumption within the framework of this concept to maximise the efficiency of production at each stage of the life cycle. In addition, special attention was paid to the interregional development of the circular economy, but trends at the level of individual enterprises were not assessed. M. Zlotnik (2022) assessed the problems in implementing the digital economy model in Ukraine. The researcher noted the main barriers to implementing the concept, including: financial difficulties, undeveloped infrastructure, low level of ecological culture. However, the findings do not provide clear recommendations for the development of the national policy in this area.

The purpose of the study was to consider the practical case of using the concept of circular economy in Ukraine on the example of the Myronivsky Hliboproduct company, which will allow drawing conclusions about what advantages and disadvantages exist in this concept, and what are the features of its use in Ukraine.

MATERIALS AND METHODS

The study used some sources that provide access to statistical information, one of which is the website of the Ministry of Finance (n.d.). This is not the official website of the Ministry of Finance of Ukraine, but it provides separate useful statistical information about the current functioning of the country.

Myronivsky Hliboproduct (MHP) was chosen as a case study for the analysis of the circular economy. The reason for the choice was that this company provides the most information in the context of actions aimed at sustainable development, and also achieved a noticeable improvement in its own activities in this area. The data was taken from the company's financial statements related to the achievement of the sustainable development goals (MHP, 2022). The study evaluated a significant number of indicators that characterise the methods used by MHP aimed at achieving the sustainable development goals, in particular, more active use of renewable energy sources and reuse of water resources. However, it is worth paying attention to the fact that data on the company is available only until 2021. It can be assumed that this is conditioned by the beginning of a full-scale Russian invasion of Ukraine in 2022. This has led to a complication of the company's functioning capabilities, and therefore, the achievement of sustainable development goals and even the development of such reports. Given the situation in the country, it can be assumed that in the conditions of war, the company's ability to comply with the principles of the circular economy has worsened, but full-fledged conclusions can be formed only after the end of the war. The company provided information separately about Ukrainian and foreign enterprises in its reports, so it is necessary to clarify that this study uses data only on the facilities located on the territory of Ukraine. All constructions and calculations were generated using Microsoft Excel.

One of the main research methods used in the study was analysis. It was used to assess a significant amount of data sources aimed at investigating features of development of the circular economy in Ukraine. This method also allowed drawing conclusions about how past trends in Ukraine's development in the field of agriculture enabled it to achieve results that are relevant for 2024. Using the comparison, various principles of achieving a circular economy were evaluated, with special attention to forming an understanding of the advantages and disadvantages of each of them. The method of forecasting, in turn, allowed making estimates of

how the MHP can develop in the context of achieving its own strategic goals of sustainable development in the long term, taking into account the war, the possibility of its end, and the state's actions in the new conditions. The tabular method was used to display information and make it easier to understand.

RESULTS

The case of MHP is one of the most famous examples of the circular economy concept in Ukraine. It actively uses innovative technologies for converting organic waste (in this case, chicken manure) into biogas. This process not only reduces CO_2 emissions, but also generates clean energy, heat and steam, contributing to energy security. By-products include organic fertilisers that support soil fertility and position Ukraine as a global player in the agricultural market. This is also particularly relevant, given the country's development during the war: according to estimates of the Bioenergy Association of Ukraine, internal resources can replace about 20 billion cubic metres of gas, or UAH 160 billion (provided the average gas price is UAH 8) (Circular economy is..., 2020; Ministry of Finance, 2023). Representatives of the company themselves suggest that the existence of urgent problems with significant amounts of waste can be beneficial for the country in the future, when technologies for their processing become more common and affordable.

Representatives of the company often attend various conferences where they talk about their own approaches to achieving the sustainable development goals. For example, Oleksandr Dombrovsky, Chairman of the Board of Global 100% RE Ukraine, President of MHP Eco Energy, during the third International Conference "National Challenge: Soil Degradation or Restoration of Soil Fertility", stressed the potential of implementing circular economy principles to solve the problem of soil fertility in Ukraine (An environmental revolution..., 2021). He stressed that the circular economy model is crucial for the "green" transformation, which is in line with the practices of the European Union. MHP adheres to the basic principles of this model, and its division MHP Eco Energy, in fact, is engaged in processing industrial waste into clean energy and fertilisers, contributing to reducing carbon emissions, increasing clean energy production, and improving environmental, food, and energy security. In addition, he called on other companies and organisations to adhere to this approach, in order to switch Ukraine to more environmentally friendly production methods.

In order to assess some of the components of implementing the principles of circular economics at MHP, it is worth examining the data that characterise their transition to sustainable development. Until 2022, the company annually prepared a "Sustainable Development Report", which contained sufficient data that characterised the company's approach and results to achieving the sustainable development goals. However, the publication of such data stopped in 2022 due to the beginning of a full-scale Russian invasion of Ukraine. Within the framework of Table 1, it is possible to evaluate the data that characterise the company's use of certain types of conventional fuel in dynamics (n terms of CO_2 emitted during their combustion).

Table 1. *Data characterising the use of certain types of conventional energy sources by MHPs in terms of CO_2 emissions from their combustion in the period from 2016 to 2021, metric tonnes of CO_2*

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Combustion of natural gas	226,964	161,930	186,414	160,107	165,289	212,491	-6.4%	-1.1%
Diesel fuel use	181,771	167,307	151,620	155,296	142,464	148,446	-18.3%	-3.3%
Gasoline fuel use	16,415	14,529	12,356	8,335	8,464	1,065	-93.5%	-36.6%
Use of compressed/liquefied gas propane butane methane and their mixtures	0	0	0	2,526	5,211	4,401	74.2%	20.3%
Total	425,150	343,766	350,390	328,579	321,428	373,673	-12.1%	-2.1%

Source: *compiled by the authors based on reporting data of MHP (2022)*

As can be seen from Table 1, the company is rapidly reducing emissions from propane-butane-methane fuel sources, such as natural gas, diesel, and gasoline (a decrease of 6.4, 18.3 and 93.5%, respectively, since 2016). However, compressed/liquefied gas, which is considered to be more environmentally friendly than other traditional sources, has become more widely used. Table 2 also shows CO_2 emissions from various sources of renewable energy in dynamics.

Table 2. *Data on the use of certain types of renewable energy sources by MHP in terms of CO_2 emissions from their combustion in the period from 2016 to 2021, metric tonnes of CO_2*

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Combustion of biomass	33,530	36,067	42,260	35,308	103,342	80,097	138.9%	15.6%
Combustion of sunflower husks and pellets	44,251	55,778	54,453	52,812	47,309	54,199	22.5%	3.4%
Total	77,251	91,845	96,713	88,120	150,651	134,296	73.8%	9.7%

Source: *compiled by the authors based on reporting data of MHP (2022)*

Table 2 shows that CO_2 emissions from renewable energy sources are gradually increasing. However, due to the fact that this is associated with the transition to renewable sources, this trend can be considered positive. Data on the total amount of CO_2 emitted into the atmosphere (separately from renewable and non-renewable sources and in total) is shown in Table 3. The company's CO_2 emissions remained virtually unchanged over the period under study. Nevertheless, the fact that the company is switching to the production of energy from renewable sources, that is, the existing structural changes in energy production, can already be considered a positive factor in the country's development in this area. It is the increase in emissions in the reports that is attributed to increased poultry production and changes in the use of natural gas for production purposes. Trends in the types of resources used to manufacture the company's products (e.g. packaging) are shown in Table 4.

Table 3. *CO_2 emissions from renewable and non-renewable energy sources between 2016 and 2021, metric tonnes of CO_2*

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
CO_2 from traditional sources	425,150	343,766	350,390	328,579	321,428	373,673	-12.1%	-2.1%
CO_2 from renewable sources	77,251	91,845	96,713	88,120	150,651	134,296	73.8%	9.7%
Total	502,401	435,611	447,103	416,699	472,079	507,969	1.1%	0.2%

Source: *compiled by the authors based on reporting data of MHP (2022)*

Table 4. *Use of different types of materials in the production of MHP products in the period from 2017 to 2021, tonnes*

Year	2017	2018	2019	2020	2021	Total change	Year-per-year change
Non-renewable, tonnes	390,264	404,632	364,858	317,801	419,194	7,41%	1.4%
Renewable, tonnes	3,399,295	3,721,033	4,120,266	4,027,223	4,180,192	22.97%	4.2%
Total, tonnes	3,789,559	4,125,665	4,485,124	4,345,024	4,599,386	21.37%	3.9%
Non-renewable, %	10.3%	9.8%	8.1%	7.3%	9.1%	x	x
Renewable, %	89.7%	90.2%	91.9%	92.7%	90.9%	x	x

Source: *compiled by the authors based on reporting data of MHP (2022)*

Renewable energy sources occupy mainly a large share in the production of MHP products, and, in addition, this share is gradually increasing, which indicates the existing positive trends in this area. Table 5 contains data describing the use of energy from renewable and non-renewable sources.

Table 5. *Energy consumption from different sources by MHP in the period from 2016 to 2021, TJ*

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Natural gas	3,852	2,895	3,333	2,864	2,957	3,802	-1.3%	-0.2%
Diesel	2,173	2,274	2,061	2,111	1,936	2,018	-7.1%	-1.2%
Petroleum	240	207	176	152	121	119	-50.4%	-11%
Compressed/liquefied gas	x	24	29	42	88	75	212.5%	25.6%
Electricity	112	1,471	1,647	1,892	1,858	1,902	1,598.2%	60.3%
Total from non-renewable sources	7,385	6,871	7,246	7,061	696	7,916	7.2%	1.2%

Table 5, Continued

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Biogas	34	479	562	469	137	1,065	3,032.4%	77.5%
Sunflower husk combustion	489	661	670	672	580	626	28%	4.2%
Total from renewable sources	523	114	1,232	1,141	195	1,691	223.3%	21.6%
Total energy consumption	7,908	8,011	8,478	8,202	891	9,607	21.5%	3.3%
From renewable sources, %	7	14	15	14	22	18	157.1%	17.0%

Source: *compiled by the authors based on reporting data of MHP (2022)*

As can be seen from Table 5, production from non-renewable sources increased by only 7%, while from renewable sources – by more than 200%. The share of renewable energy production in general has also increased significantly. Notably, the company is engaged in the sale of generated energy: and although these values are not significant (131 TJ in 2017 and 429 TJ in 2021), however, the fact that the company has the ability to sell energy indicates positive trends in its development.

In its sustainability reports, the company constantly emphasises that it is committed to environmental responsibility, for which is the responsibility of the company's board of directors. Each MHP facility in Ukraine has a full-time environmental protection specialist, while the European operating segments have different environmental management structures. Key aspects of MHP's environmental policy include a plan to achieve carbon neutrality by 2030, integrating environmental considerations into core business decisions, complying with environmental legislation, continuously improving environmental management efficiency, reducing emissions, reducing waste, preserving fresh water, preserving biodiversity, and using renewable energy. In the future, the company plans to increase the use of renewable energy, focusing on the development of biogas production facilities. Separately, it is worth considering how MHP uses water resources. This can be estimated by analysing the data from Table 6.

Table 6. *Data on the use of water resources by MHP in the period from 2016 to 2021, thousands of cubic meters*

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Surface water	3,872	3,739	4,810	6,093	6,982	6,742	74.1%	9.7%
Ground water	5,929	6,040	6,417	6,997	6,878	7,111	19.9%	3.1%
Wastewater from third-party organisations	0	34	438	438	439	438	1,194.98%	66.9%
Municipal and other water supply systems	109	111	286	288	250	251	130.5%	14.9%
Total	9,909	9,924	11,952	13,816	14,549	14,542	46.7%	6.6%

Source: *compiled by the authors based on reporting data of MHP (2022)*

MHP is gradually increasing the use of water resources, despite the fact that it considers reducing the negative impact on water to be one of its goals. However, in their report, they note that the activities of MHP enterprises do not affect the water balance in the regions, since they strictly adhere to the relevant regulations, including restrictions on the use of land adjacent to coastal strips. Although the general trend was to increase the use of income, in 2021 its volumes decreased. MHP performs actions to ensure the reuse of water resources. Some data on this issue are shown in Table 7.

Table 7. *Data on water waste disposal by MHP in the period from 2016 to 2021, tonnes*

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Reuse	4,441	60,408	9,117	70,732	81,143	63,017	1,319%	55.6%
Composting	7,642	3,479	3,443	16,829	7,269	3,283	-57%	-13.1%
Isolation of valuable components	51,799	1,279	1,111	112	102	59	-99.9%	-67.7%
Combustion	7,642	3,479	3,443	2,610	987	16,308	113.4%	13.5%
Disposal to landfill	5,968	17,087	17,574	13,143	11,754	11,412	91.2%	11.4%
Storage at MHP enterprises	483	1,343	123	529	4,432	2,484	414.3%	31.4%

Table 7, Continued

Year	2016	2017	2018	2019	2020	2021	Total change	Year-per-year change
Transferred to contracted third parties	61,086	28,586	25,843	25,219	24,096	28,867	-52.7%	-11.7%
Total	131,534	112,281	139,280	129,174	129,783	125,430	-4.6%	-0.8%

Source: *compiled by the authors based on reporting data of MHP (2022)*

As can be seen from Table 7, the total utilisation of water resources by the company has also decreased, which is not a good indicator of the achievement of the sustainable development goals. Thus, the main area in which MHP works to achieve the sustainable development goals and achieve a circular economy is the synthesis of biogas from broiler chicken waste and its use as alternative energy sources (Kumar *et al.*, 2023; Kristia & Rabbi, 2023). In the future, there are plans to switch to the production of biomethane (a renewable analogue of natural gas) and biodiesel (respectively, an analogue of diesel). In general, this approach to waste recycling in the industry is quite effective, and the company should continue working in this line, solving problems that may arise along the way (Ebrahimian *et al.*, 2022; Kalita *et al.*, 2023). As of 2024, the biggest problem for MHP is the war in Ukraine. At the beginning of the invasion, the company quickly began to take active actions in supporting Ukrainians, ensuring cooperation with other companies and international partners.

It is important that the state, as one of the important actors influencing the development of enterprises, also helps companies achieve sustainable development goals. Although active conduct of such activities is unlikely in a war, however, after it ends, government officials should begin to pay more attention to such companies and their environmental initiatives. Comprehensive state support should include financial assistance, namely access to subsidies and financing for agricultural enterprises that implement circular practices. Other important components are the provision of information support and advice for farmers and the creation of favourable legislation, the creation of appropriate infrastructure for the development of renewable energy, the possibility of waste disposal, processing of raw materials from agricultural enterprises, etc. Such a set of measures will contribute to the sustainable and environmentally responsible development of agriculture in the context of a circular economy.

DISCUSSION

The concept that MHP uses is just one of the options for how the company can achieve circular development. For example, instead of using waste as sources for fertiliser production (Neeraj *et al.*, 2022; Pajura *et al.*, 2023), it is possible to use waste collection to produce products for other industries: one option is the production of packaging from recycled materials (Ibrahim *et al.,* 2022). There are more such examples, but each company should choose the option that it considers the most effective, which will be influenced by both the financial capabilities of the company and the long-term development strategy: it is likely that it will be formed by using several options for waste processing at once (for example, simultaneous production of energy and fertilisers).

In general, cyclical economics in agriculture was studied by T. Selvan *et al.* (2023). Researchers emphasised the negative impact of traditional food production methods on the environment and their contribution to the development of non-communicable diseases. The paper describes the degradation effects that occur due to the use of a conventional production model, and speaks about the need to switch to a circular one. Researchers also noted the importance of investigating various practices of organic agriculture and agroforestry (biodynamic agriculture, regenerative practices of agroforestry) for the possibility of their use in the future. Given that these practices mimic natural ecological processes, they can simultaneously provide a high level of efficiency in the context of manufactured products and have a positive impact on the environment. Ultimately, researchers note the importance of providing companies with financial support in order to enable them to implement such methods. In the framework of the study on the circular economy in Ukraine, such methods of influencing the environment in the agricultural sector were not evaluated. This is due to the fact that they are not common within the country; however, it is expected that with their more active use in other countries, these methods will be used in Ukraine as well.

The circular economy in the agricultural sector was studied by J.F. Velasco-Munoz *et al.* (2022). The results indicate a growing interest in this area of research with a focus on environmental aspects. Researchers emphasised the existence of problems with feeding a growing population, the negative impact of agriculture on the environment, and the potential of a circular economy to solve these problems. Circular economy is evaluated as a solution for reducing resource consumption, waste

generation, and negative impact on the environment in the agri-food system. The economic and social benefits of implementing the principles of a circular economy, and the potential to increase gross domestic product (GDP), create jobs and increase the profitability of farmers, were evaluated. The study highlights the importance of moving from a linear to a cyclical economic model in food production. As part of the assessment of the situation with the circular economy in Ukraine, the importance of developing this concept in the long term was also described. However, it is necessary to pay attention to the fact that such initiatives are likely not to have significant support from the state, since as of 2024, the primary problem in the country is war.

The introduction of a cyclical economy in the agricultural supply chain based on data from Indonesia was studied by R. Nattassha *et al*. (2020). The study highlights the importance of a circular economy in the agricultural supply chain, and emphasises its role in reducing food waste, improving production efficiency, and promoting sustainability. As part of the study, the researchers proposed a conceptual model aimed at improving the efficiency of agriculture in the circular economy: it functions based on understanding the circular economy as a whole system of seven areas that companies should pay attention to when implementing the model. The importance of using state support to support "green" producers was also described. As noted above, state support is indeed an important component of the qualitative development of such companies. Enterprises with a circular economy can effectively resist the negative impact on the environment. However, only if these two components interact can qualitative results be achieved in the context of achieving the sustainable development goals.

The path of sustainable development of agriculture based on the concept of circular economy was investigated by L. Zhenjian *et al*. (2021). Researchers have shown that significant efforts have been made in China to modernise agricultural production. The development of the agricultural circular economy has become an important strategy for stimulating this modernisation process and is an integral part of achieving sustainable development in the agricultural sector. Thus, researchers note that the concept of circular development is an important component of the future development of the economy of any country. However, certain features of its implementation should be personalised depending on the cultural, social, and economic characteristics of the state. The importance of the circular economy concept was also assessed in this paper on its implementation in Ukraine. Given the need to pay much more attention to environmental issues, applying the concept of a circular economy can be one of the most effective ways to improve the situation.

A system for assessing the state of transition to sustainable development at cyclical agricultural enterprises was developed by S. Rodino *et al*. (2023). Researchers emphasised the heterogeneity of the circular economy in agriculture, drawing attention to the diverse consequences of its implementation and the need for a diverse set of indicators to effectively measure the state of implementation of this concept. These indicators should cover the following aspects: resource use, waste management, assessment of environmental sustainability, and overall efficiency of the agricultural system. Their research drew considerable attention to the fact that international cooperation with other countries plays a significant role in this area. It was also noted that there is a need to develop more accurate measurement methods adapted to the specifics of agriculture in different regions, in order to form more objective assessments of the ecological state of enterprises. Although this study did not focus on the development of such assessment methods, the authors agree that this may help the state in the future to assess compliance with the concept of a circular economy by individual enterprises and thus regulate the amount of their support.

CONCLUSIONS

Myronivsky Hliboproduct is an example of successful integration of the principles of circular economy into a large agricultural enterprise. The company's innovative approach to converting organic waste, in particular chicken manure, into biogas demonstrates its commitment to achieving the sustainable development goals, which goes beyond simple responsibility for the environment. This process not only reduces CO_2 emissions, but also generates clean energy, heat and steam, which significantly contributes to Ukraine's energy security. Despite a break in the publication of sustainability reports due to the beginning of a full-scale Russian invasion, the data available and analysed in the study until 2022 show significant progress of MHP in the context of the development of the circular economy. The trends in biogas production and the unchanged level of CO_2 emissions despite the company's overall expansion demonstrate the effectiveness of the policy. MHP's commitment to becoming carbon neutral by 2030 and integrating environmental considerations into business decisions reflect the company's long-term plans to achieve its sustainable development goals. The company's approach goes beyond energy production and covers water management. Although some steps have already been taken in this area, the efficiency of solving

these problems is relatively lower than in the field of energy production from biomaterials.

The main problem of the company's development as of 2024 is the consequences of a full-scale Russian invasion of Ukraine. As part of the study, it is difficult to assess exactly how it affected the company in terms of achieving a circular economy, but considering other areas of its activities, the company helped Ukrainians from the very beginning of the war, especially in the field of food security support, demonstrating compliance with the principles of corporate and social responsibility. It is to be expected that the situation in terms of the development of the circular economy is deteriorating. However, after the end of the war, together with state support, which plays an important role in achieving sustainable circular production, and with the improvement of the situation in the country in all its areas in general, the restoration of the company's strategic goals in this area will continue. That is why a promising area for future research is to analyse the achievement of circular economy principles by other Ukrainian and global companies to compare their approaches.

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CONFLICT OF INTEREST

None.

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Практичне дослідження впровадження циркулярної економіки на аграрних підприємствах України

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Анотація. Зважаючи на роль аграрного сектору для розвитку економіки України, важливо знаходити методи підвищення ефективності його функціонування. Оскільки одним із них є впровадження циркулярної економіки, то дослідження кейсів її застосування в країні є актуальним. Ціллю дослідження стало показати приклад впровадження даної концепції в Україні, зобразивши вигоди та недоліки від її застосування. Основними методами дослідження стали аналіз, порівняння та прогнозування. В рамках роботи було проведено оцінку найбільш вагомого прикладу впровадження принципів циркулярної економіки на підприємстві, а саме компанії «Миронівський Хлібпродукт». Було показано, що основою підходу компанії є переробка відходів на біогаз та використання його в якості енергії. Цей процес не лише дозволяє не збільшувати викиди CO_2 в атмосферу, але й значно ефективніше використовувати наявні в неї ресурси. Крім того, описувалися особливості вторинної переробки водних ресурсів та існуючі тенденції в цьому напрямку. Особлива увага зверталася на те, з якими складнощами стикнулася компанія під час початку повномасштабного вторгнення Росії 2022 року, та які дії були вжиті для покращення ситуації. Також було зроблено висновки стосовно того, якими є вірогідні можливості досягнення компанією цілей в розрізі циркулярної економіки, зважаючи на сучасні тенденції розвитку України. Практична цінність роботи полягає у користі для формування рекомендацій підприємствам щодо впровадження концепції циркулярної економіки. Крім того, дані з роботи можуть бути використані представниками держави для підвищення ефективності впровадження політики в аграрній сфері

Ключові слова: біогаз; водні ресурси; фінанси; державне управління; сталий розвиток