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Natalia Skorobogatova

CREATING THE MODEL OF BALANCED BUSINESS DEVELOPMENT BASED ON ECOSYSTEM APPROACH

The object of research is the process of creating effective relationships between the participants of the economic system, which is based on the need to ensure its balanced development in an unstable environment. One of the most problematic places is that at present the main criterion for the effectiveness of the model for organizing relationships between participants is the economic result, other aspects of the rational creation of an ecosystem are not considered, namely: innovative, environmental, social.

The study proved that considering a systematic approach allows making effective management decisions at the level of a business ecosystem, considering the results obtained by all its agents. The basis of the model of balanced business development model is the transition to a circular economy, which allows reducing resource consumption, reducing the negative impact on the environment, and complying with relevant socio-economic standards.

On the example of an agricultural complex, a model of an agribusiness ecosystem was created, including participants and internal relationships between them. The agents of the internal environment include resource (service) providers, agricultural manufacturers and customers (buyers), detailing their roles in this system.

A methodical approach to assessing the effectiveness of management decisions based on a multi-criteria assessment in four areas is proposed: economic, environmental, social, and innovative. For implementation, one should choose a solution that gives the maximum value of the integral indicator at the system level, considering the participation of each of its agents.

The proposed solutions will contribute to more sustainable production and consumption patterns, which will provide opportunities for developed and developing countries to achieve economic growth and sustainable development.

Keywords: *balanced development, agribusiness ecosystem, sustainable development, model efficiency, systemic approach, economic agents.*

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1. Introduction

For a long time, the main stimulus for the development of scientific and technological progress on a global scale was the maximum satisfaction of human needs. The main quantitative indicators of production efficiency were productivity and profitability, that is, the goal of the production process was to increase productivity and profitability. With further observance of this development strategy, while simultaneously increasing the population in the middle of the 20th century, a group of scientists [1] predicted crisis phenomena in the future: climate change, natural disasters, depletion of natural resources, land degradation, lack of food, etc. The need to revise the model of development of society has been declared by international organizations at the global level. A number of scientists have been looking for ways to solve this problem for a long time. In particular, the concept of sustainable development of society, the transition to a green economy, the introduction

of a circular economy, etc. were proposed. Each of the available approaches reflects the temporal and technological features of development. In order to form a model of balanced development that considers not only economic and environmental problems, we consider it necessary to apply an ecosystem approach that considers the peculiarities of the interaction of all elements of the economic system and the possibility of their adaptation to changing environmental conditions.

2. The object of research and its technological audit

The object of research is the process of creating effective relationships between the participants of the economic system, which is based on the need to ensure its balanced development in an unstable environment. One of the most problematic places is that at present, the main criterion for the effectiveness of the model for organizing relationships

between the participants in the process is the economic result. Other aspects of the rational creation of an ecosystem are not considered, namely: innovative, environmental, social.

3. The aim and objectives of research

The aim of research is to develop a structural and logical model of balanced business development based on the ecosystem approach. According to the purpose of research, the following tasks are set in the work:

1. To identify the reasons that hinders the effective functioning of business at the present stage of development of society.

2. To create the diagram of the relationship between participants in business processes based on the ecosystem approach using the example of the agricultural sector.

3. To assess the prospects and threats for the further development of the business ecosystem on the example of the Ukrainian agricultural sector.

4. Research of existing solutions to the problem

For a long time, the basis for creating an economic system was the model of a linear economy, within which resources are mined and turned into goods or services, sold and used, and then thrown into the trash [2, 3]. This model has been at the heart of the world economy since the first industrial revolution, which implies the growth of wealth due to the growing extraction of resources. The trend towards an increase in population and income on a global scale encourages an increase in demand for goods and services [1, 4]. One of the options for solving this problem was proposed the concept of sustainable development [5], which provides for a triune solution: economic, environmental and social areas. At the same time, this concept has rather fuzzy criteria and parameters. The problem of reducing the burden on the natural environment was studied by representatives of ecological economics [6, 7]. The evolution of this issue has led to the need to review approaches to the organization of production processes and the transition to a circular economy model as a way to reduce dependence on primary materials and energy [8–10]. At the same time, the rapid development of information and communication services within Industry 4.0 has made it possible to significantly change the organization of business and production processes. In particular, the authors of [11] note the positive impact of these technologies on economic results. A number of scientists recognize possible threats to the social development of society and the ambiguity of the impact on the environment [12]. In addition, the high degree of uncertainty inherent in the modern economy due to the impact of COVID-19, international military conflicts, etc. lead to an objective need to revise scientific approaches to creating a sustainable development model based on an ecosystem approach, which will ensure the sustainability of the business ecosystem.

5. Methods of research

The following scientific methods were used in the study:

- methods of critical analysis – for critical analysis of existing approaches to ensuring a balanced development of society;

- a combination of methods of analysis and synthesis, a systematic approach – to formulate the concept of an agribusiness ecosystem and identify internal relationships between its agents;
- multi-criteria approach – to develop a model for assessing the level of balance in business development.

6. Research results

The main goals that were determined by the owners of private businesses for a long time were focused on maximizing profits and business value. The dominance of economic goals is confirmed by the priorities of investors when choosing an object for investing free resources, and by the structure of financial reporting forms, on the basis of which investment and management decisions are also made. Thus, the main factor was the effectiveness as the degree of achievement of the planned indicators. Efficiency, as the comparability of the results obtained with the costs of their achievement, was discussed only from an economic point of view. The impact on nature, the degree of depletion of resources, social consequences were considered as a single side effect. At the same time, society's awareness of the threats to its continued existence in the face of existing resource consumption trends to meet existing needs has led to the need for a radical change in both the consumer's mind and the producer's priorities. In particular, as noted [13], the problem of sustainable development of society prompts a revision of the paradigm of further development: from the ideology of accumulating material wealth to the ideology of «smart sufficiency», from the ideology of competition to the ideology of mutual assistance. Therefore, the priorities of the owner and potential investor should shift from the assessment of economic efficiency to a comprehensive assessment of efficiency in order to obtain the desired result, given the expediency of the costs incurred [14].

An analysis of the current degree of development of society indicates the transition to the stage of crisis phenomena that scientists predicted in the last century [1]. Currently, there are a number of analytical studies to assess the prospects for the functioning of a business. According to experts from the World Economic Forum [15], the main risks that the world economy will have to face are the following:

- failure to combat climate change;
- extreme weather conditions;
- loss of biodiversity;
- erosion of social cohesion;
- livelihood crisis;
- infectious diseases;
- environmental damage from human activities;
- natural resource crisis;
- debt crises;
- geo-economic confrontation.

Let's believe that one of the ways to solve this problem is the use of an ecosystem approach to the organization of business processes.

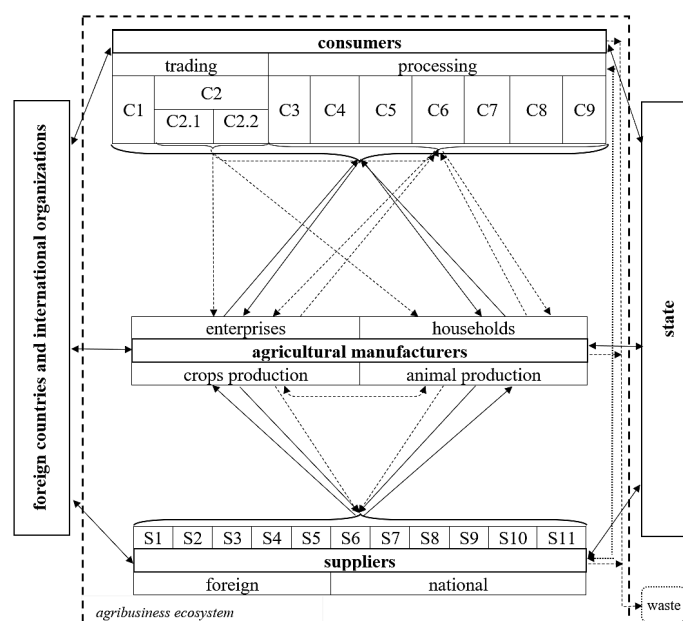
The concept of an ecosystem was first introduced by the English ecologist A. Tansley in 1935. Under the ecosystem, he understood the basic functional unit in ecology, since it includes organisms and the inanimate environment – components that mutually influence each other's properties, and the necessary conditions for maintaining life in its form that exists on Earth. That is, an ecosystem

is understood as a set of living organisms (communities) and their habitat, which form a stable system of life due to the circulation of substances. For existence and further prosperity, these living organisms compete and interact, change, adapting to changing environmental conditions. Thus, the basis of this concept is the sustainable development of certain objects in a certain environment. In the early 1990s, business strategist James Moore adapted the concept of an ecosystem to the business environment. He proposed the concept of a business ecosystem [16]. In particular, a company (enterprise) should not be viewed as a separate player in the market, but as a representative of a business ecosystem that includes many participants from different industries. Similar to an ecosystem in biology, business ecosystems also adapt to changing conditions, moving from a random set of elements to a more structured composition. Many scientists offer different approaches to the definition of a business ecosystem, considering the type of activity, the analysed scale and management methods. The economy of Ukraine is closely dependent on the development of the agricultural sector. We consider it appropriate to introduce a model of balanced business development in agriculture. In particular, the example of the highly developed countries of the world shows that the possibility of creating a much greater added value in agriculture than there is today in Ukraine. For this, the processing of raw agricultural products should be carried out in Ukraine, and not exported. It will also stimulate the development of processing industries and engineering, reduce waste, create additional jobs and help restore the national economy. In addition, in their pursuit of greater productivity, agricultural producers and processors are neglecting the environmental impact on both nature and consumers. A systematic approach is needed to solve these problems [17].

Thus, let's propose to understand the agribusiness ecosystem as a set of economic agents that interact for the rational combination and use of resources in the process of manufacturing, processing and marketing agricultural products, considering the balance of economic, environmental, social and innovative components of its development. The participants in the agribusiness ecosystem and relationships emerging between them are schematically shown in Fig. 1. It should be noted that the basis for building a model of balanced business development is the concept of a circular economy, which provides for the reuse of resources and products as much as possible, their processing back into raw materials, and use as a source of energy or, in extreme cases, recycling. Thus, the consumption of resources and environmental pollution are significantly reduced. The transition to environmentally friendly organic production using a circular economy model allows to completely eliminating waste that must be disposed of outside the system. In Fig. 1, the waste streams produced by each of the participants and redirected for processing to other participants in the system are displayed with dotted lines. For example, unsold and

unused amounts of food from resellers and end-users can be returned to agricultural producers and used as animal feed or fertilizer. Also, unsold vegetables and fruits can be sent to processors for food production, etc. At the same time, the relationship of the consumer (customer) – manufacturer – supplier within the ecosystem can significantly reduce the impact of the risk of the external environment and reduce logistics and transaction costs. With the influence of time, it is possible to change technologies, market conditions, the interests of economic agents of the system, etc., which can lead to a change in the ecosystem.

The efficiency of the functioning of an ecosystem should be determined by the results of all its agents in the aggregate, and not separately. Moreover, according to a systematic approach, the maximum effect of cooperation cannot always be achieved with the simultaneous best result of each of the participants. As already noted, in modern conditions, management, considering external restrictions, should prevail the principle of logical sufficiency, and not maximizing the economic effect. It is necessary to apply the concept of total cost of ownership, when the decision on the feasibility of acquiring or producing an object is determined not on the basis of its initial cost (acquisition price plus delivery, collection, adjustment, storage, etc.), but considering the associated costs for maintenance and operation.



Consumers:

- C1 – exporters
- C2 – domestic market
- C2.1 – resellers
- C2.2 – end users
- C3 – manufacturers of food products, drinks, tobacco products
- C4 – manufacturers of textiles, clothing, leather products
- C5 – manufacturers of wood products, paper, printing
- C6 – manufacturers of chemicals and products
- C7 – manufacturers of pharmaceutical products and preparations
- C8 – furniture manufacturers
- C9 – biofuel producers

Suppliers:

- S1 – melioration
- S2 – technologies
- S3 – land
- S4 – labour personnel
- S5 – machinery and equipment
- S6 – fertilizer
- S7 – plant protection products
- S8 – selection
- S9 – packaging
- S10 – feed
- S11 – veterinary drugs

Fig. 1. The model of agribusiness ecosystem (created by the author)

In addition, we consider it necessary to supplement this concept. In particular, the full cost of ownership should be understood as the full costs of acquiring and maintaining an object, considering the economic, social, environmental consequences and the degree of its innovativeness.

The criteria for innovation can be quantitative and qualitative features (quality of services provided, ease of use, duration of possible use, etc.). In accordance with the concept of a circular economy, the lengthening of the life cycle of a product is welcomed. That is, it should be used for as long as possible. In relation to the agricultural complex, this may be a different technology for tillage or fertilization. According to this concept, when choosing alternative options for fertilizing, it is necessary to consider not only current benefits (increased yields when applying mineral fertilizers), but the possibility of land restoration, pollution of water bodies with runoff from agricultural fields, compliance with environmental requirements for harvested crops, etc. The best option will be the one that provides an overall positive result. According to experts in the field of agriculture, the excessive use of mineral fertilizers has a number of negative consequences for the environment. The Green Deal has been adopted at the European Union level. One of the programs is Farm to Fork [18], based on organic farming. Comparing the results of each of the ecosystem agents in four components (economic, environmental, social, innovative), a comprehensive multi-criteria assessment of the feasibility of making a particular management decision in terms of its impact on the ecosystem can be carried out. Of course, over time there will be changes in the composition of the agents of the agribusiness ecosystem, and in the relationship between them, and in the state of the environment itself within the system. However, the task of effective management is to ensure the balance of its development in four directions for all agents. To do this, it is proposed to assess the feasibility of deciding based on the analysis of the model indicators:

$$BD_{AM} = EC_{AM} + EN_{AM} + S_{AM} + I_{AM},$$

$$BD_C = EC_C + EN_C + S_C + I_C,$$

$$BD_S = EC_S + EN_S + S_S + I_S,$$

$$BD_{AES} = BD_{AM} + BD_C + BD_S \rightarrow \max,$$

where BD_{AM} , BD_C , BD_S , BD_{AES} – integrated indicator of balanced development of each of the agents of the agribusiness ecosystem (manufacturers BD_{AM} , suppliers BD_S and customers BD_C) and the system as a whole (BD_{AES}); EC_{AM} , EC_C , EC_S – economic component for each of the agents, respectively; EN_{AM} , EN_C , EN_S – environmental component for each of the agents, respectively; S_{AM} , S_C , S_S – social component for each of the agents, respectively; I_{AM} , I_C , I_S – innovation component for each of the agents, respectively.

At the same time, the proposed approach will lead to more sustainable production and consumption patterns. This can provide opportunities for developed and developing countries to achieve economic growth and inclusive and sustainable development. The proposed approach can be implemented not only in Ukraine but also in other countries.

The disruption of supply chains due to military operations on the territory of Ukraine has a significant impact on the development of the agrarian complex and the national economy as a whole. Well-established business

processes have been disrupted both with the participation of Ukrainian economic agents and with the participation of foreign partners. In addition, in an effort to minimize their own risks, many countries are actively moving to the introduction of protectionist policies. Thus, let's believe that the use of the proposed sustainable development model based on the ecosystem approach by businesses has significant prospects for further application. The proposed approach makes it possible to reduce the dependence of the national economy on external suppliers and processors, since it is based on the principles of a circular business model. In addition, in the conditions of war and post-war economic recovery, the application of the business ecosystem will stimulate the development of related industries and the transition to the production of agricultural products with higher added value. The agribusiness ecosystem model includes all stages of value-added creation: supply of resources – production – processing – consumption. At the same time, a threat to a full-fledged transition to the proposed model is the need to revise the priority goals of the business, namely the desire not only to obtain the maximum economic effect (profit), but also to consider the social and environmental consequences of decision-making; their impact on the activities of other participants in the system. Therefore, in this case, state support is necessary both through the adoption of the necessary legislative documents and additional funding (including by attracting foreign investment).

7. SWOT analysis of research results

Strengths. The paper proposes a business development model that allows:

- to build effective relationships between all its participants and reduce the impact of risk and uncertainty;
- to reduce the negative impact on the environment;
- to reduce the consumption of natural resources, reduce waste; helps to reduce the logistics costs of its participants.

Weaknesses. It is possible to check the effectiveness of the proposed measures only after their implementation.

Opportunities. The results of the study can be implemented at the national and local levels when creating a development strategy for the state, industry, region. They can also be useful for individual economic agents to determine the feasibility of merging with other market participants into a business ecosystem.

Threats. Threats can be brought by the unwillingness of individual economic agents to introduce a balanced approach to assessing the feasibility of making managerial decisions and their consequences because of the desire to maximize profits, ignoring the interests of other participants, as well as environmental and social consequences.

8. Conclusions

1. Recognition of economic characteristics as key business results does not allow it to work effectively at the present stage of development. The reduction of natural resources, the increase in consumption with population growth, the increase in emissions and waste, social conflicts in society, the rapid development of information and communication technologies in the context of Industry 4.0 – all these factors must be considered to build an effective

business model. To streamline the goals and results of business, it is proposed to systematize them in four areas: economic, environmental, social, and innovative.

2. Internal relationships between participants in business processes were identified (on the example of the agricultural sector), which made it possible to combine them into a single agribusiness ecosystem. Based on the ecosystem approach, a model of balanced business development has been developed, which is based on the transition to a circular economy. Combining economic agents within a closed ecosystem, considering the identified internal relationships between them, will improve the efficiency of the entire business ecosystem, while ensuring its balanced development.

3. Since agriculture is one of the basic sectors of the national economy of Ukraine, its example suggests the use of an ecosystem approach to ensure a balanced business development. A model of an agribusiness ecosystem has been developed that includes all stages of value-added creation: supply of resources – production – processing – consumption. A mechanism of interaction between its participants is built on the basis of possible functional relationships in a circular economy. The proposed approach will ensure the sustainability of the existence of business ecosystems and promote the development of the national economy.

References

- Meadows, D., Meadows, D., Randers, J., Behrens, W. (1972). *The limits to growth. A Report for the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books. Available at: <https://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf>
- Michelini, G., Moraes, R., Cunha, R., Costa, J., Ometto, A. (2017). From Linear to Circular Economy: PSS Conducting the Transition. *Procedia CIRP*, 64, 2–6. doi: <https://doi.org/10.1016/j.procir.2017.03.012>
- Saiatli, F. (2017). Linear Economy Versus Circular Economy: A Comparative and Analyzer Study for Optimization of Economy for Sustainability. *Visegrad Journal on Bioeconomy and Sustainable Development*, 6, 31–34. doi: <https://doi.org/10.1515/vjbsd-2017-0005>
- Climate Change 2021: The Physical Science Basis* (2021). Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf
- Report of the World Commission on Environment and Development: Our Common Future* (1987). Available at: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>
- Hoepner, A. G. E., Kant, B., Scholtens, B., Yu, P.-S. (2012). Environmental and ecological economics in the 21st century: An age adjusted citation analysis of the influential articles, journals, authors and institutions. *Ecological Economics*, 77, 193–206. doi: <http://doi.org/10.1016/j.ecolecon.2012.03.002>
- Melnik, L. G. (Ed.) (2009). *Sustainable development: theory, methodology, practice*. Sumy: University book, 1216. Available at: https://essuir.sumdu.edu.ua/bitstream-download/123456789/44445/1/Melnik_sustainable_development.pdf
- Geissdoerfer, M., Morioka, S. N., de Carvalho, M. M., Evans, S. (2018). Business models and supply chains for the circular economy. *Journal of Cleaner Production*, 190, 712–721. doi: <http://doi.org/10.1016/j.jclepro.2018.04.159>
- Manninen, K., Koskela, S., Antikainen, R., Bocken, N., Dahlbo, H., Aminoff, A. (2018). Do circular economy business models capture intended environmental value propositions? *Journal of Cleaner Production*, 171, 413–422. doi: <http://doi.org/10.1016/j.jclepro.2017.10.003>
- Lewandowski, M. (2016). Designing the Business Models for Circular Economy – Towards the Conceptual Framework. *Sustainability*, 8 (1). doi: <http://doi.org/10.3390/su8010043>
- Vyshnevskiy, O., Liashenko, V., Amosha, O. (2019). The impact of Industry 4.0 and AI on economic growth. Scientific Papers of Silesian University of Technology. *Organization and Management Series*, 9 (6), 391–400. doi: <http://doi.org/10.29119/1641-3466.2019.140.32>
- Buhr, D. (2017). *Social Innovation Policy for Industry 4.0*. Available at: https://japan.fes.de/fileadmin/user_upload/events/2017/pdf-files/Social_Innovation_Policy_for_Industry_4.0.pdf
- Shkarupa, O. V. (2015). Ecological modernization of socio-economic development of the region in the light of social transformations: theoretical and methodological principles. *Marketing and innovation management*, 3, 235–249.
- Skorobogatova, N. Ye. (2012). Liquidity as a factor in managing the financial development of industrial enterprises. *Bulletin of KNUiD*, 2, 149–157. Available at: https://er.knutd.edu.ua/bitstream/123456789/3562/1/V64_P149-157.pdf
- The Global Risks Report* (2022). World Economic Forum. Available at: https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf
- Moore, J. F. (1999). Predators and prey: a new ecology of competition. *Harvard Business Review*, 71 (3), 75–86.
- Skorobogatova, N. (2019). Conceptual basis for formation of sustainable development of society in the context of Industry 4.0. *Economic Bulletin of NTUU «Kyiv Polytechnical Institute»*, 16, 388–400. Available at: <http://ev.fmm.kpi.ua/article/view/182748/182675>
- Farm to Fork strategy – European Commission* (2020). Available at: https://ec.europa.eu/food/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf

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