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Determinants of “green entrepreneurship” competitive strategies implementation in the agro-industrial sector of Ukraine

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Abstract. “Green entrepreneurship” practice dissemination is one of the “sustainable development” concept strategic goals. In agro-industrial sector this practice involves the business processes environmental optimization, which requires significant investments for technological changes and limits the competitive strategies variability for small and medium enterprises. Ukraine’s agricultural sector “green entrepreneurship” projects investing analysis confirmed that they mainly involve big business. This updates the problem of “green entrepreneurship” competitiveness increasing. This article purpose is to substantiate vectors and modalities for participatory development of agro-industrial business network for realization the competitive business strategies in the “green business” field. It has been emphasized that the membership and the business network structure should provide business processes adaptive and proactive flexibility. It has been identified this flexibility determinants in the structure of the participants innovative potential, which can accumulate specific resources and competencies for the “green” entrepreneurship competitiveness. The scheme of formation the specific resources owners’ strategic partnership for the competitive business strategies realization has been developed. It has been indicated that in the agricultural sector this allows to increase the joint innovation potential for cleaner production in all parts of the value chain. It has been recommended to coordinate the strategic priorities of the participants on the methodological basis of the game theory, which will contribute to the partnership stability and effectiveness.

Keywords. Green entrepreneurship, sustainable development, agro-industrial sector, competitive strategies, business network structure, strategic partnership

1. Introduction and review of literature

The problem of “green” entrepreneurship development is multifaceted and is considered primarily within the context of the “sustainable development” concept. It is based on the idea of economic growth while maintaining a dynamic balance within the economic capacity of the natural environment, which does not cause nature irreversible changes and does not pose threats to the long-term human existence as a species. This concept is becoming increasingly relevant under recent events, when the pursuit of economic growth for the people current well-being has led to the acceleration of climate change threatening the existence of future generations. In addition, overcrowding in metropolises and the significant geographical length of logistics chains (as factors and results of economic growth) endangered the existence of the current generation, as they created the conditions for the rapid spread



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of infectious diseases, which are becoming more frequent and scale, crossing the epidemiological threshold. And the Covid-19 pandemic has significantly intensified discussions on the feasibility of globalization processes further development this time within the context of human security and its survival as a species. The rise of such threats on a global scale is forcing us to think about how to make national economies less vulnerable to the global challenges and more competitive.

In this connection scientists are paying more and more attention to the environmental component of the “sustainable development” concept – emphasizing the priority of environmental protection. For example, Ali Özgür Karagülle noted in his work that the environmental problems solution should be of a strategic nature, occupying an important place in the “sustainable development” strategy. He also indicated that the greening of business, as well as corporate social responsibility, will have positive impact on the company’s competitiveness level [1].

This is emphasized in the work of Mohd Helmi Ali, Norhidayah Suleiman – exploring the relationships between standard food production practices and the sustainable production principles, they indicated that compliance with environmental standards can go hand in hand with other sets of production standards [2].

Bulent Menguc and Lucie K. Ozanne consider this problem in the same way – they define NEO (natural environmental orientation) of business as three components: entrepreneurship, corporate social responsibility (CSR) and commitment to the natural environment [3].

The ecological component of business is very visible in the work of H. Baumann, F. Boons and A. Bragd – using the “environmental optimization” concept, they focus on the formation of conditions and tools for its implementation at the micro level (within companies); at the same time, they point to the need for interaction of “green” business entities with public administration bodies. The latter should be reflected in the state policy of supporting such business at the strategic level. The authors emphasize the need to combine the efforts of science and business [4]. This statement is absolutely true, but for its implementation it is necessary not only to promote the goals of resource consumption environmental optimization, but also to stimulate the relevant processes. In the field of research through the grants system and in business by the microcredit environment.

Rouf, Kazi Abdur considered the peculiarities of the “green” microcredit implementation for enterprises and its impact on environmental and economic development. In particular, the author found that microcredit contributes to the economic development of enterprises, local communities and meets the goals of sustainable development [5]. Therefore, the issue of financing “green” business initiatives is considered by the authors as crucial and important for ensuring the balanced development of the community, region, country.

Tim Newton and George Harte share the same view – analyzing the content of the economic category “green business”, they noted that environmental changes in the organization will occur only through increased government regulation [6]. We believe that state regulation is important to ensure sustainable development, as it acts as a lever to provide external incentives for entrepreneurs to comply with environmental, ethical and moral requirements. However, the internal motives of the producer, intermediary, consumer are no less relevant, because the self-motivation for energy-saving, environmentally friendly production and “smart” consumption will ensure the preservation of natural resources and the environment for future generations.

Such motives are of particular importance for the network of partners who are planning to move to “green” entrepreneurship. A. Abuzeinab and M. Arif found that a business model is considered to be “green” when changes are made to it ensure the environment preservation combined with economic benefits. The authors also stressed that a key factor in gaining a competitive advantage in a changing market environment is the ability of business to interact with stakeholders [7]. In our opinion, such interaction should be especially fruitful for the development of “green” entrepreneurship – because innovative changes in one of the business model links usually require appropriate changes in the production and marketing systems of other participants in the value chain. To maximize the effects of their implementation, it is necessary not only to harmonize the content of innovative changes within the current project, but also to increase the ability of participating companies to create and implement

future innovations. That is, joining forces to develop the overall innovation potential of the partnership in accordance with the concept of “green entrepreneurship”.

This requires the innovative potential information and marketing components strengthening and filling them with specific tools for work with the market. This is emphasized in researches of Legominova [8], Khachatryan [9], Vdovenko, Deriy, Seliverstova & Kurmaiev [10]. It can also take the in-company training form to acquisition of new competencies by employees in the field of marketing researches, communications and the intrapreneurship development Pererva, Nagy & Maslak [11].

Obviously, a necessary prerequisite for effective business redesign should be modeling of the change effects. Yuanhsu Lin, Ming-Lang Tseng, Chih-Cheng Chen, Anthony S.F. Chiu proposes to evaluate the green business innovative potential using various methods: fuzzy set theory, analytical network process and analysis of importance and efficiency, hybrid method [12]. In our opinion, such methods can be used to model joint innovative changes of potential partners in the partnership.

In our opinion, it is necessary to differentiate the innovative potential structural elements by their role in ensuring the innovative process effectiveness, taking into account the activity specifics in the target markets. Then, depending on the individual components importance in maximizing consumer value for the target consumer groups, it will be possible to develop a program for the enterprise intellectual potential development for each of the partners according to the chosen business model.

One of the optimization modelling option of the enterprise innovative potential structure according to this approach has been made by us [13]. However, the optimization of the innovation potential structure has been considered by us in the context of one enterprise. To implement the “green entrepreneurship” concept it is important to see the directions and create conditions for the innovative potential development of all participants in the consumer value chain. The urgency of this task to ensure the Ukraine's economy sustainable development has determined the purpose of this article.

The purpose of this article is to substantiate vectors and modalities for participatory development of agro-industrial business network for realization the competitive business strategies in the “green business” field.

2. Research methodology

Content analysis methods have been used to study scientific views on the essence of “green” entrepreneurship and its place in the goals set of the economy “sustainable development”. Economic-statistical and comparative analysis methods have been used to study the dynamics and structure of the EBRD investment support in Ukraine for sustainable development projects in the field of agro-industrial production. Methods of analysis, synthesis and logical generalization have been used to substantiate the directions and conditions for developing the agricultural producers’ strategic partnership potential in the implementation of “green” business projects and competitive business strategies.

Abstract-logical and graphic modelling methods have been used to visualize the process of specific resources owner’s strategic partnership formation for the implementation of competitive business strategies. To coordinate the partner network actors’ strategic priorities in the process of investing in joint projects in the “green” entrepreneurship field have been used game theory methodological approaches, in particular, achieving Nesh equilibrium.

3. Results

3.1. Investment support for the development of “green entrepreneurship” in Ukraine: trends and problems

The spread of practices and technologies of “green” entrepreneurship in Ukraine is most often associated with agricultural production and processing enterprises, which continue the chain of consumer value, adhering to the resource efficiency and environmental safety principles. And it makes sense because these national economy sectors are significant share of production and sales, while

directly affecting the environment and consumer safety – current and future. In addition, Ukraine's agricultural products are exported in large quantities – and not only for technical consumption. This encourages international institutions to get involved in the process of supporting sustainable development projects in this area, among which “green” business projects have special place.

An important international institution for supporting green entrepreneurship is the European Bank for Reconstruction and Development (EBRD), which invests in business to create an open, free market and ensure sustainable growth of the world's economies. The EBRD's position in promoting sustainable development is ensured by the following approaches: to focus on the climate emergency by supporting the Paris Agreement implementation; the environmental and social requirements inclusion into the assessment and implementation of all Bank-funded projects which are based on the European Union (EU) standards and international best practice; to provide finance and technical assistance specially aimed at promotion of environmental and social benefits; to promote access to municipal services, like water and public transport; to support projects that promote social and economic inclusion and gender equality; to provide consultation and information open publishing, and maintaining systematic dialogue with organisations of civil society and other stakeholders; to ensure that stakeholders' opinion is taken into account [14].

In Ukraine, the EBRD also actively invests private and state-owned enterprises projects implemented in line with the concept of sustainable development. In particular, those which are aimed at the development of energy-saving and environmentally friendly production and consumption, achieving social effects and reducing social tensions in society (Fig. 1).

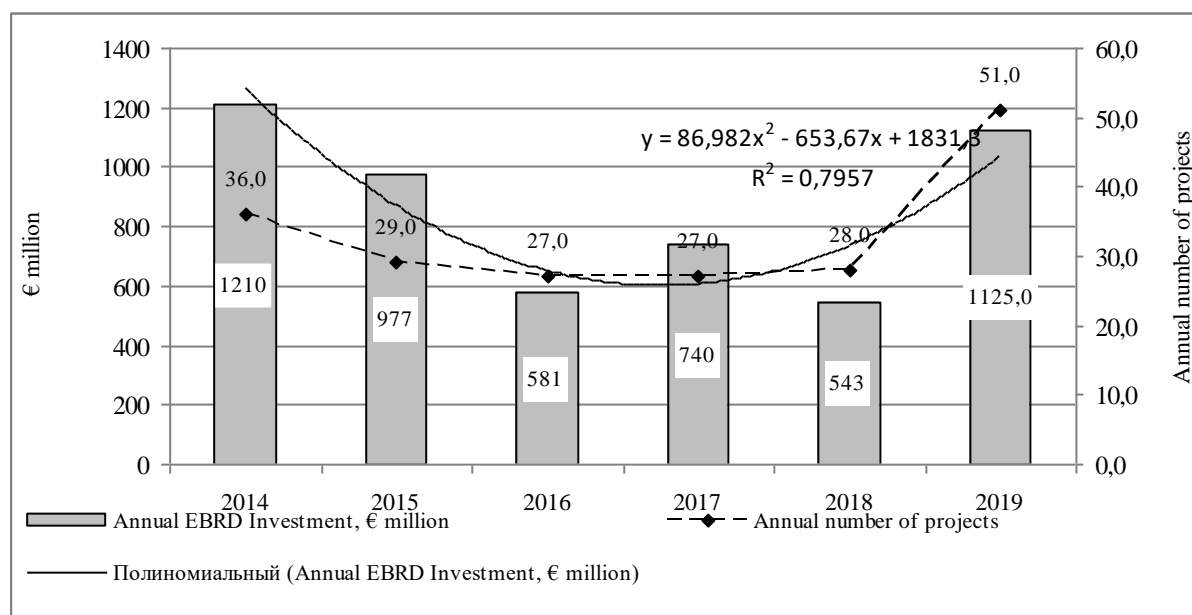


Figure 1 Annual volume of EBRD investments in Ukrainian projects (built on [15])

Unfortunately, in 2015-2018 there was a negative dynamic of attracting investment into the Ukraine economy in the framework of cooperation with the EBRD. However, in 2019 there were significant positive changes in this area – the EBRD financed the implementation of 51 projects with an annual investment of 1125 million euros.

Even larger investments are planned for 2020. The sectoral structure of the current portfolio of EBRD-financed projects in Ukraine in 2020 shows that 2,410 million euros, or 60% of the investment flow, is expected to be allocated for the sustainable infrastructure development (Fig. 2), (built on [15]). Industry, commerce and agribusiness are on the second place in EBRD projects investment attractiveness – 1291 million euros or 32%.

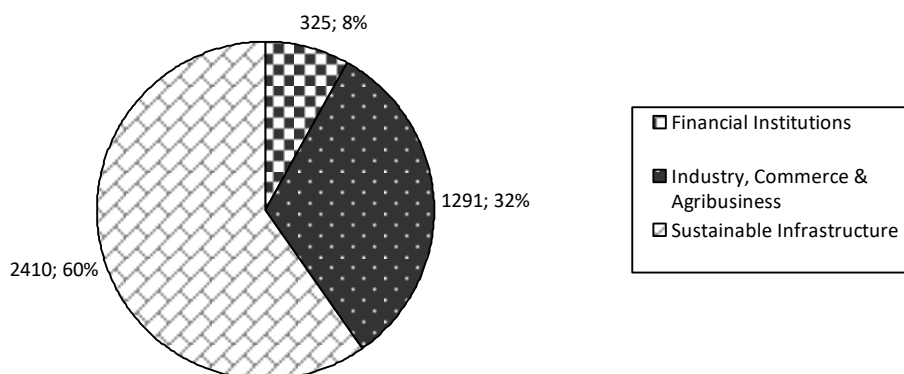


Figure 2 Current portfolio of projects, Ukraine, as of August 31, 2020, € mill; % (built on [15])

The analysis of EBRD-financed projects in 2018-2019 showed that the main investment objectives were production modernization, logistics facilities improvement, implementation into production environmental norms and standards to reduce the negative impact of agricultural production on the environment (Table. 1, compiled on the basis of [16]).

Table 1 Portfolio of agricultural projects financed with the participation of the EBRD [16]

Name of the agribusiness entity	Investment in the project US\$, million		Benefits for sustainable development provided by the funding program	Project status
	total	from the EBRD		
2018 year				
Nyva Pereyaslavshchyny LLC	80.1	30.0	Implementation activities funding of energy efficiency, ecological, sanitary and hygienic norms in economic activity	Disbursing
DNIPRO-ENERGO-RESURS LLC	5.8	5.0	Financing the biomass boiler construction that use bird droppings from the company's farms and optimize its energy consumption and reduce operating costs	Disbursing
Kernel Group	110.0	48.0	Financing of long-term investments in agribusiness infrastructure	Disbursing
2019 year				
KERNEL HOLDING SA	390.0	800.0	1. Financing the creation and use of open digital solutions for precision farming. 2. Financing of elevator logistics IT solutions for servicing small and medium farmers	Approved
ZERNO-AGROTRADE LLC	252.0	30.0	Financing the implementation of modern IT solutions and agricultural technology (for precision farming); maintaining and strengthening feedback with local suppliers and improving their quality standards	Approved
KERNEL HOLDING SA	300.0	80.0	1. Financing the expansion of access to open digital precision farming solutions. 2. Financing elevator connections by facilitating access to Kernel logistics or other logistics solutions using the "Transithub" platform	Signed

As can be seen from the content of the projects listed in Table 1, they provide implementation of energy efficiency measures and improvement of business processes technological components. A significant place in this list is occupied by IT solutions that promote the development of precision agriculture, logistics improving, quality control of products during storage, improving the organization of work with farmers, etc. But they are aimed at supporting the environmental component improvement of the large agro-industrial companies. The main reason for this is that the EBRD does not finance the implementation of the entire project, but only partially participates in it. The projects require significant investments, which are beyond the reach of smaller business structures.

Of course, the implementation of these projects is beneficial not only to big business, but also to society as a whole – not only the producers operating costs are reduced, but also the environmental stress. However, the principles of sustainable development must be spread throughout the business environment – so it is important to involve small and medium businesses in the process of economical resource use and organic farming. One of the ways to spread “green” technologies in the business environment of Ukraine is the formation of agro-industrial business networks, which can significantly increase their resource and innovation opportunities, directing them to the implementation of relevant projects for joint business.

3.2. The potential of agricultural producers' strategic partnership in the implementation of “green” business projects and competitive business strategies

In the agro-industrial sector of Ukraine there are many farms and processing enterprises, the scale of which is small. To maintain their competitiveness, they typically choose niche strategies that rely on market innovation. Quite often, these strategies for their purposes can be attributed to the sphere of “green” entrepreneurship. However, technologically their implementation not always can be ensured, as the resource potential of most farms is insufficient to attract modern technologies of organic farming. These resources can be accumulated within a strategic partnership – in integrated business networks. Organizational development of such a partnership should be carried out on the principle of competence and resource complementarity – in order to maximize the target function. Partnerships can coordinate their business decisions, achieving the necessary level of flexibility in responding to global consumer and scientific and technological trends.

Such flexibility achieving, in our opinion, is a key task of the agro-industrial business network resource potential innovative component, the level of which should determine the task of managing its development. This allows to increase the competitive strategies choice variability for the business network members, without limiting only to niche. Choosing a competitive strategy, it is important to give priority to innovative factors, as they can make competitive advantages more sustainable. To do this, innovation must be coordinated in all interconnected business processes, which requires adequate partnership. After all, without this it is impossible to ensure the necessary level of business strategies key parameters coordination for strengthening their competitiveness.

In general, by transforming partnerships in the business network into the status of strategic, it is possible mutually increase the innovation component of both resource and market potential of all participants in the agro-industrial business network, which will provide the necessary conditions for their operation, growth and development according to the principles of “green” entrepreneurship. At the same time, the key role in the functional support of such partnership development should be played by the producer of the final product – because it is in direct contact with the market and develops the new products concept in line with consumer demand trends.

The solution to these problems belongs to the marketing sphere and requires adequate information and analytical support. It is advisable to justify and make appropriate decisions by actively interacting with existing/potential partners involving them in mutually agreed organizational or technological changes. Schematically it is shown in Fig. 3.

In our opinion, this approach to coordinate the strategic partnership in the agricultural sector allows to increase the joint innovation potential in line with the production greening in all parts of the value chain – from agricultural products growing to it industrial processing. According to its structure, the

innovative potential of the agro-industrial business network should be based on the specifics of creating consumer values in the agricultural sector set of elements and connections between them that will give participants flexibility and ability to respond quickly to dynamic market changes.

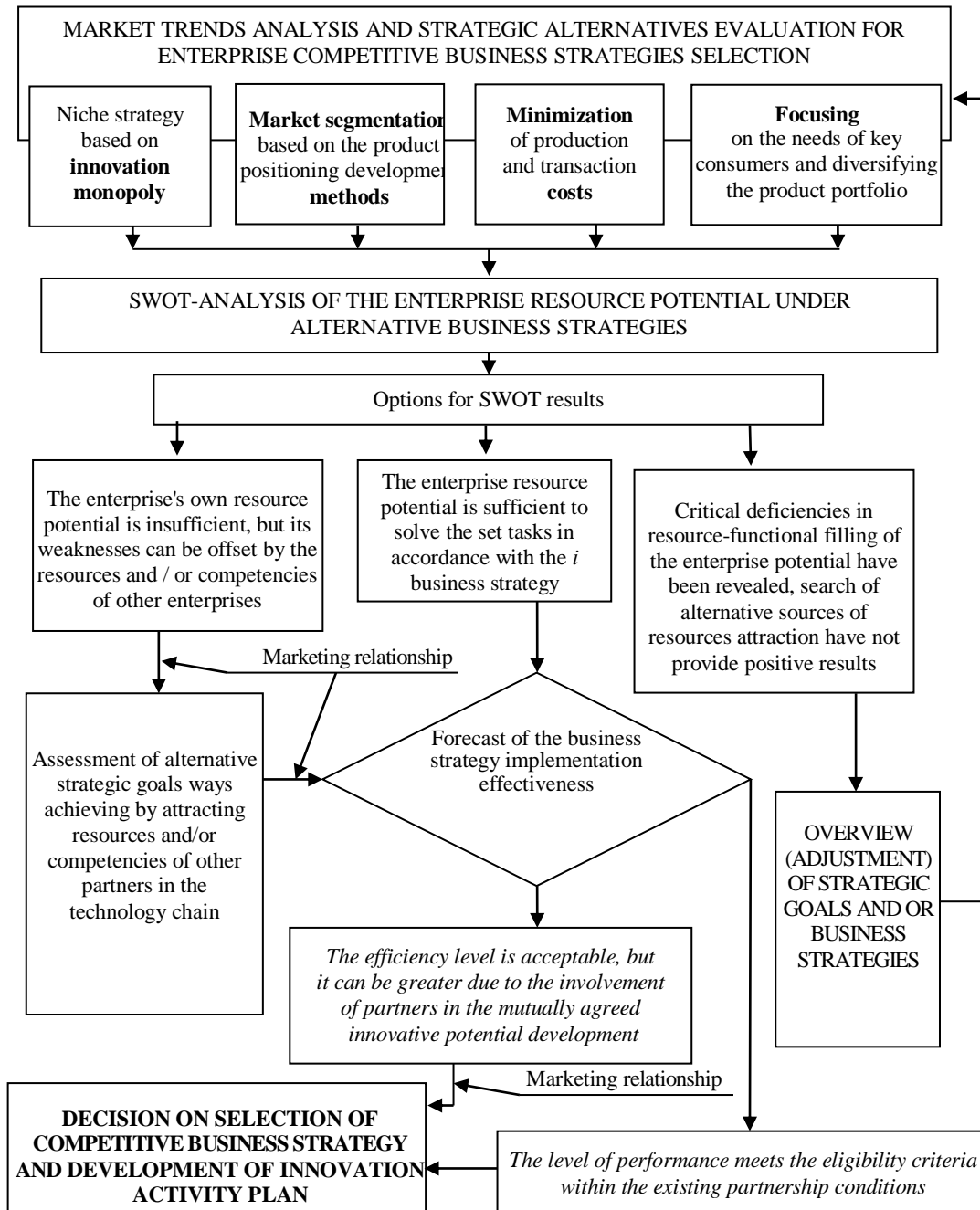


Figure 3 The scheme of formation the specific resources owner’s strategic partnership for the competitive business strategies realization (authors’ design)

An important role in formation the flexibility of the business network belongs to the innovation potential marketing component. First of all, it should provide a qualified analysis of market conditions and identify consumer needs trends in strategic management areas. The results of such analysis serve

as a basis for determining the directions of competitive advantages formation in ways and means of meeting these needs, in particular, through mutually agreed innovative changes. However, for the strategy success in the field of “green” agricultural entrepreneurship, it is extremely important to position organic products on the market. The marketing complex for such positioning has been presented by us in [17].

As noted by G. Sokoliuk [18], adaptive flexibility is provided by the resource-functional component of innovative activity, and proactive is provided by competence and motivational one. In this statement context it is expedient to consider the structure and vectors of innovative potential development of the agro-industrial network, which seeks to operate on the principles of “green” entrepreneurship. Particular attention should be paid to attracting specific resources to the business network, which will enhance the greening of business processes or their efficiency. The combined capital of the network members opens up broader prospects for them to participate in EBRD programs aimed at supporting sustainable development projects.

However, for such an association, it is important for the participants to see what results each of them can achieve. And so – how the expected results can motivate them to implement joint projects (for example, environmental optimization of business processes carried out by the partners).

For solving this problem, it is advisable to use scientific and methodological approaches of game theory, setting a goal to achieve a Nash equilibrium between the actors of the partner business network in terms of the investment amount they can invest in a joint project. The conditions for joint investment of such project may be the international investment fund participation (for example, the EBRD), which will reduce the investment risks of the partners and increase the likelihood of not only environmental but also economic effect (ensuring project profitability).

Based on the existing developments regarding the mechanisms of free market participants mixed financing [19], we adapt it to the conditions of the partner network. The task should be outlined by the following initial data: the partner agricultural network, which contains n participants (actors), evaluates the effectiveness of the joint investment project initiated by the actor i ; $i \in N = \{1, 2, \dots, n\}$. The project provides the environmental optimization of the processes set that form the technological basis of the network business model. The EBRD is expected to be involved in this process investing, as it is a sustainable development project. The total investment of the project is expected to be S_i . The project expertise will determine its cost-effectiveness for the partnership $f_i(S_i)$, $i \in N$.

The task is to develop such a mechanism $\mu(S)$, which will provide the maximum effect of the project investment process, which would satisfy all actors of the partnership:

$$E_m = \sum_{i=1}^n f_i(S_i^*), \quad (1)$$

where $S^* = \{S_i^*\}$ – equilibrium strategies of actors to invest in a business network project (Nash equilibrium point [20]).

That is, reaching the Nash equilibrium point in this process demonstrates the network actors agreement on the contribution each of them to the investment total amount required for project supporting by EBRD. However, this is not enough. Every participant in the investment process expects a return from it.

Assume that the project return for the i -th actor of the network will be $a_i y_i$, where $y_i \geq 0$ is the amount of his investment; $a_i \geq 1$, $i \in N$. Suppose also that for all participants of the partnership a single standard $\beta \geq 1$ is defined. The mechanism of mixed investment has the form: $c_i = \mu_i(y)$, $i \in N$, where $y = (y_1, y_2, \dots, y_n)$ – the size of network actors’ own investments (priorities vector). That is, the target function of the i -th actor is defined as follows:

$$f_i(y) = (a_i - 1)y_i + (a_i - \beta)\mu_i(y), i \in N \quad (2)$$

Define the mechanism of direct investment priorities; the priority of the i -th participant is denoted as l_i

$$\mu_i(y) = \frac{l_i y_i}{\sum_{i \in N} l_i y_i}, i \in N \quad (3)$$

Find Nesh's equilibrium. To do this, substitute (3) in (2) and differentiate the obtained expression for the objective function of the agent by y_i , $i \in N$:

$$l_i(y_i) = L(y)[1 + b_i L(y)], i \in N \quad (4)$$

where

$$b_i = \frac{a_i - 1}{(a_i - \beta_i)l_i}, i \in N, \quad L_i = \sum_{i \in N} l_i y_i.$$

Summing (4) for all actors in the network and substituting $L(y)$ in (4), we obtain an expression that shows the Nash equilibrium of the actors' game in the case if the mechanism of direct priorities with the priority vector $\{l_i\}$ is used:

$$y_i^* = \frac{n-1}{B^2} [(n-1)b_i - B], i \in N \quad (5)$$

where $B = \sum_{i \in N} b_i$. In so doing the condition must be fulfilled $y_i \geq 0$ or

$$\frac{a_i - 1}{(a_i - \beta_i)l_i} \geq B/(n-1), i \in N \quad (6)$$

If condition (6) is violated, the actors are not motivated to invest in a joint development project. It is necessary to reconsider the values of the distribution norms of the expected effect between them and to make new calculations. Or review the list of the business network members, if there are actors in the market with similar resources who agree to the current terms of cooperation. At the same time, as can be seen from Figure 3, when analysing the resource capabilities of potential participants, it is necessary to pay attention to their ability to make future changes – because the strategic partnership must be flexible, with sufficient innovation potential to implement proactive competitive strategies.

In addition to the economic component of the motivational structure of the participants in the strategic partnership, it is also necessary to cultivate systemic trust relationship. Then partners positively evaluate each other's actions in the process of choosing the directions and scales of innovative changes, without looking for threats to their security. This will eliminate the causes of opportunistic partners behaviour, develop cooperation and mutual support in identifying and solving new problems.

4. Conclusions

One of the strategic goals of the “sustainable development” concept is to expand the forms and methods of involving business in solving environmental problems through environmental optimization of business processes. In the agro-industrial sector, this involves the development of “green” entrepreneurship various models – both in the field of agricultural production and in the field of its processing. However, this usually requires significant investment to implement technological change and limits the variability of competitive strategies for small and medium-sized enterprises that do not have sufficient resources to do so. The existence of such a problem is confirmed by the analysis of the dynamics and content of investing in “green business” projects in the agricultural sector of Ukraine – there are few such projects and they mainly involve big business. Moreover, the EBRD's support for sustainable development projects only partially concerns the “green” aspects of entrepreneurship, and about 60% of investments are directed to the development of general sustainable development infrastructure. We have been stated the expediency of developing the “green” entrepreneurship business models in the agro-industrial sector of Ukraine, which should cover the entire chain of

consumer value creation, which will increase the chances of its participants to compete in world markets with organic farming products. The paper develops scientific-methodical and practical recommendations for the development of such a business model within a strategic partnership. The recommendations were based on the thesis that the participants list and the business network structure should provide adaptive and proactive flexibility of business processes, which requires joint efforts to develop the business network innovative potential. We have identified the determinants of this flexibility in the structure of the participants' innovative potential, which can accumulate specific resources and competencies for the "green" entrepreneurship competitiveness. The scheme formation the specific resources owners' strategic partnership for the competitive business strategies realization has been developed. It has been emphasized that in the agricultural sector it allows to increase the joint innovation potential in line with the greening of production in all parts of the value chain. In this process, it has been determined the place of marketing interaction between the participants of the strategic partnership, which should functionally provide a justification for joint innovative changes for effective work in the target markets.

It has been noted that it is not less important to form a positive motivational environment for the sustainability of the strategic partnership and the innovation potential development within its organizational shell. Such motivational environment should ensure the loyalty of all participants to the accepted way of using the resources of each in joint projects and determining its income share from their implementation. It is equally important to maintain motivation for implementation of joint investment projects. For small businesses, this makes it possible to combine efforts to create competitive advantages that meet the principles of sustainable development and use the investment support of international development funds to implement green business projects. Coordination of such projects participants strategic priorities should be carried out on the methodological basis of game theory. Determining the conditions for achieving Nash equilibrium and their correlation with the strategic priorities of each participant can serve as a basis for adjusting both the content of the partnership and the list of project participants within the strategic partnership.

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