ОРГАНИЗАЦИЙНО-ЭКОНОМИЧНЫЕ МЕХАНИЗМЫ ЗАЛУЧЕНИЯ ИНВЕСТИЦИЙ В ГАЛУЗЬ АКВАКУЛЬТУРИ

Актуальность. Роль аквакультуры в сельскохозяйственной структуре Украины важна переоценивать. За часы независимой Украины общий объем продукции данной галузь сокращается с каждым годом. Причина для такой тенденции гвато — недосконала стратегия менеджмента рыбной галуз, низкий уровень инвестиционной привлекательности, высокий уровень подъема рыночной структуры, слабая поддержка с стороны государства и так далее. Через воронения Росии в Украину проблем стало еще больше. Питание залучения инвестиций в сектор аквакультуры является актуальным, как возможность развития данной галузь, так и инструмент реформирования рыбного комплекса и создания основанной законодательной базы. В результате, возрастает уровень затраты на сырье и инвестиции, а также растет уровень коррупции.

Мета та завдання. Мета работы заключается в выявлении актуальности данной галузь и возможности ее развития. Материалы и методы. В статье использовался системный анализ функциональных аспектов. Как информационная база в статье использовались научные работы видных исследователей, статьи и тезисы, а также интервью и статьи журналистов по данной тематике. Также для визуализации ситуации в галузь использовались статистические данные Департамента статистики Украины.

Результаты. В статьи отмечено, что аквакультура в экономике Украины является важной. Определена необходимость сокращения затрат на производство продукции данной галузь. В статье были описаны пути решения проблем, связанных с недостаточным развитием аквакультуры. В статье были представлены результаты исследования, которые показали, что аквакультура в Украине имеет значительный потенциал для развития и улучшения условий жизни населения. Однако, для реализации этих возможностей необходима государственная поддержка, которая может быть обеспечена через создание специальных механизмов и инструментов.

Выводы. На основании проведенного анализа можно сделать выводы, что аквакультура в Украине имеет значительный потенциал для развития. Однако, для реализации этих возможностей необходима государственная поддержка, которая может быть обеспечена через создание специальных механизмов и инструментов. В статье были предложены некоторые реформационные идеи и предложения по развитию аквакультуры в Украине. Эти предложения могут быть реализованы на основе анализа состояния галузь в Украине и опыта других стран. В целом, статья представляет собой результаты исследования, которые могут быть использованы для принятия решений на государственном уровне.
ORGANIZATIONAL AND ECONOMIC MECHANISMS OF ATTRACTING INVESTMENTS IN THE AQUACULTURE SECTOR

Topicality. The role of aquaculture in the agricultural structure of Ukraine is difficult to overestimate. During the times of independent Ukraine, the production volume of this industry has been decreasing every year. There are many reasons for this trend - imperfect fisheries management strategies, low level of investment attractiveness, high level of shadow market share and corruption, weak support from the government, high share of imported goods on the market, etc. Due to the invasion of Russia into Ukraine, the problems became even more. The question of attracting investment in the aquaculture sector is very urgent, as an opportunity for the development of this industry, as a tool for restructuring the fishery and improving the legislative framework with the aim of better regulating the activities of this industry, as well as increasing the level of import substitution of fish in the country's market. A successful approach to attracting investments in the fishing industry of Ukraine and its regions can help solve problems not only of an economic nature, but also of a social nature (ensuring food security).

Aim and tasks. The purpose of the work is to study the current state of the aquaculture industry in Ukraine and to develop recommendations for increasing the level of investment support for this industry.

Materials and methods. The article uses a general analysis of the given problem. As an information base, the article uses scientific works of prominent scientists, articles and theses that are in the public domain, as well as interviews and articles of journalists on the given topic. Also, statistical data of the State Statistics Service of Ukraine were used to reflect the situation in the industry in practice.

Research results. The article indicates the role of aquaculture in the economy of Ukraine, describes the current state of the fishery industry based on statistical data and open sources of information. The current state of aquaculture, compared to other years, is seen as an opportunity to grow to a higher level of profitability and production volumes that were already achievable thirty years ago. Examples of the implementation of laws and support from local governments in the field of aquaculture are given. In order to understand possible ways to improve the state of investment provision of the fishing industry, this research provides the experience of other countries in investing in aquaculture, the features of investing in the blue economy in the EU, and the experience of private companies. Recommendations are given on possible measures to attract investments in the fishing industry. It is also described the procedure for implementing the mechanism of investing in an enterprise or industry.

Conclusion. Based on the data indicated in this research, it is concluded that the aquaculture industry is currently in a state of crisis. It was concluded that Ukraine currently has opportunities to attract investments in the aquaculture industry, but state guarantees for investors and protection of their funds during the war are needed.

Keywords: aquaculture, investments, organizational and economic mechanisms.

Problem statement and its connection with important scientific and practical tasks. Aquaculture is an integral part of the national Ukrainian economy. This industry is not only an important sector of the economy, but also a means of ensuring the country's food security, which determines the importance of stable support and development of the fishing business.

Analysis of recent publications on the problem. The article analyzes data from open sources, in particular, the State Agency of Meliorashion and Fisheries of Ukraine, the Agravery Agrarian Information Agency, the Association of Fishermen of Ukraine, the State Statistics Committee of Ukraine, the WWF World Nature Fund in Ukraine, and the World Bank Group. Among experts and authors of analytical works on the topic, there is a consensus about the need to attract investment in the aquaculture industry of Ukraine, but the issue of the mechanisms of attracting investment and their features in the field of aquaculture, especially in wartime, is not sufficiently researched.

Allocation of previously unsolved parts of the general problem. Having analyzed the issue of the development of the aquaculture industry in Ukraine, we can note that the issue of attracting investment in this industry in war conditions remains unresolved today. Today's state of both the fishing industry and the economy as a whole prompts the search for ways to improve the state of aquaculture and rebuild the entire industry after the war.

Formulation of research objectives (problem statement). In 1990, the production volume of the aquaculture industry in Ukraine...
reached its peak and amounted to 136.5 thousand tons (Kukcharev, 1998). After that, production volumes decreased every year. Today's level of development of this field is incomparably low, and some scientists claim that it is even critical. According to various estimates, more than 80% of the total volume of fish consumed in Ukraine is imported from abroad (Martsynovskyy, 2021). This is despite the fact that Ukraine has a theoretically significant natural potential for the development of fish farming and aquaculture: the total area of water bodies is 10.4 million hectares, of which more than a third are suitable for fish breeding (Chistyakov, 2020). Ukraine has the largest area of water bodies in Europe suitable for aquaculture. In addition to economic problems, political problems are imposed. Due to the invasion of Russia and the beginning of this war on the territory of Ukraine, various branches of production and economy, including industrial fishing and aquaculture, suffered great losses:

- Costs of industrial fishing:
  - $25.4 million - losses of commercial fishing entities;
  - $17.7 million - losses of commercial fishing associated with the ban on fishing as a result of the introduction of martial law in Ukraine;
  - $7 million - losses related to damage to fishing facilities;
  - $0.7 million - losses associated with damage to production facilities.
- Regarding aquaculture in 2022:
  - $21.6 million - losses of aquaculture subjects due to Russian aggression;
  - $8.5 million - increase in production costs;
  - $8.1 million - a drop in profit as a result of economic activity;
  - $4.4 million - losses due to the destruction of production facilities;
  - $0.6 million - losses due to the loss of breeders (Klymenok, 2023).

These are not all the losses that will occur in aquaculture during the war, but it is worth working on the restoration of the industry today. In our opinion, the situation that has developed in the field of aquaculture should be considered not as an irreversible process of degradation of the industry, but as possible opportunities for development. As mentioned above, Ukraine has a natural potential for the rapid development of the fishery complex. In Ukraine, there are specialists in fish breeding, scientific personnel for the development and introduction of innovations in production processes, projects to improve the legislative framework for the better functioning of the industry, established relations for the sale of fish products abroad, and the country's reputation in the international community. With such prospects, the question arises: where to find money for the development of the fish business or aquaculture in general?

The purpose of this study is to substantiate the relevance of the issue of investing in the aquaculture sector, to indicate methods of investment attraction and to draw conclusions about the prospects of this industry.

**Materials and methods.** The article uses a general analysis of the given problem. As an information base, the article uses scientific works of prominent scientists, articles and theses that are in the public domain, as well as interviews and articles of journalists on the given topic. Also, statistical data of the State Statistics Service of Ukraine were used to reflect the situation in the industry in practice.

**An outline of the main results and their justification.** Despite the fact that a large-scale war is ongoing in Ukraine, the issue of attracting investments is urgent. With the right management strategy, even with the production volumes that we have today, it is possible to achieve an economic boom in the industry, because, according to the official data of the State Fisheries Agency of Ukraine, today more than 7,850 reservoirs are used for aquaculture, and according to modest estimates, fish farming there can be brought to the number about 98 thousand tons per year (Hoch, 2018). For comparison, let's look at the statistics on fish production in recent years (Figure 1).

As can be seen, the volume of fish production is steadily decreasing every year. Such a trend is unacceptable, especially when there is a trend of accelerated development of aquaculture in the world.

The main mechanism for regulation and stimulation of investment attraction should be the state, and more precisely, its legislative framework (Laiko, 2017). There is no necessity to look for complicated ways and strategies for the economic development of the fishing industry, because Ukraine has an example of how even during a war it is possible to stimulate private farms to develop their business. In 2022, the Comprehensive Program for the Support and Development of Agriculture of the Lviv Region for 2021-2025 envisaged two directions for business entities in the fishing industry (Aquaculture producers of Lviv Oblast, 2022). Aquaculture producers who purchase in the current year breeding material of fish for the reproduction of brood stock and stocking of
reservoirs will be able to receive compensation from the regional budget in the amount of 50% of their value, within the limits of UAH 40/kg - for herbivorous fish breeds and UAH 50/kg - for carp and other species of fish, except for valuable species. The maximum amount of compensation is UAH 200,000 for one business entity.

![Figure. 1. Volumes of fish production in aquaculture in Ukraine for 2018-2021, tons](image)

Source: compiled by the authors according to (State Statistics Service of Ukraine, 2018-2021).

The program also provided for a subsidy for the area of stocked water bodies in the amount of up to UAH 5,000 per hectare. The maximum area of stocked wetlands is limited to 10 hectares for one business entity.

Aquaculture producers can also (Aquaculture producers of Lviv Oblast, 2022):
- attract preferential loans at 5% per annum for the development of business projects;
- to reimburse in the amount of 1.5 times the accounting rate of the National Bank of Ukraine interest on loans obtained from banking institutions, and interest (commission) for maintenance of financial leasing contracts.

Therefore, examples of the implementation of a well-thought-out system of support for the aquaculture sector in Ukraine already exist and can be implemented not at the regional, but at the state level. For example, the Draft Law of Ukraine dated 10.10.2022 No. 8119 "On Attracting Investments in the Development of Fisheries Industry" (Draft Law of Ukraine No. 8119, 2022) submitted to the Verkhovna Rada provides for clearly defined concepts and actions necessary to attract investments specifically in the aquaculture industry. This law also guarantees investor protection against losses, which is relevant at the time of hostilities in the country. Protection of the investor's property at the level of established laws can significantly increase the investment attractiveness of Ukrainian aquaculture for foreign investors.

Then the question arises: what are the peculiarities of investments in the aquaculture industry and their sources?

If it is considered the issue of finding investments in terms of a specific enterprise, and not the industry as a whole, then there are the following areas of investment attraction: platforms for launching startups, a network of business angels, crowdfunding platforms, business incubators and accelerators, Small Business Administration, social networks of professionals, market direct investment (10 proven ways to find an investor, 2023).

If it is considered the search for investments in the context of the state, it will be relevant to attract investments through economic reforms of the aquaculture industry, attract foreign investors for the development of enterprises or the industry, increase the investment attractiveness of the aquaculture industry or the economy of the country as a whole, credit in international organizations to improve the economic situation of the industry and others. World experience proves that the main mechanisms for attracting foreign investments to Ukraine are: the introduction of free economic zones, the formation of joint ventures, the creation of joint-stock companies, leasing, the opening of transnational companies, the organization of venture enterprises, concession (Investment credit, 2011).

In the process of attracting funds to finance investment projects, the form of ownership is also important. It is clear that it is more difficult for individual investors to find the necessary funds for the implementation of investment projects than for collective or joint ones. State investment projects are implemented, as a rule, at the expense of centralized state funds or budget funds (Burkynskyi, 2014).

Investment lending should be considered as a source of financing projects for the development of aquaculture in terms of both an enterprise and the industry as a whole. Investment lending is the lending of direct investment measures or real
investments (investments in fixed capital and in the growth of material and production stocks) (Investment credit, 2011). In turn, an investment loan is an economic relationship between a creditor and a borrower regarding the financing of investment activities on the basis of repayment and, as a rule, with the payment of interest. This relationship is characterized by the movement of value (loan capital) from the lender to the borrower and in the opposite direction. Attracting this type of loans makes it possible to build, increase and/or develop production capacity in order to achieve a higher profit in a shorter period of time.

For the aquaculture industry, the application of investment lending is promising in terms of the development of the aquaculture industry, which would be based on the principles of environmental sustainability, efficiency of resource usage, innovation, competitiveness and scientific knowledge, as well as in the development of the sphere of sales and processing of products (Katan, 2017).

These measures, in our opinion, are really necessary for the sustainable development of aquaculture, but today there is a more acute problem that stops the development of this industry. During the war, a significant number of aquaculture farms were damaged or destroyed. Investment lending itself can help restore production on old sites and create it on new ones. If measures are implemented at the legislative level that can improve credit conditions for entrepreneurs, thereby increasing the investment attractiveness of aquaculture as an industry and accelerating its recovery and development after the war, then it is possible to achieve the most mutually beneficial results (short-term and long-term) for entrepreneurs, investors and the state.

After the source of investment is determined, it is necessary to develop an investment project in which the strategy of future actions that will bring profit is described in detail. Funds from direct foreign investment are received for a specific investment project that has interested a foreign investor (Boyko, 2018).

In order to understand whether there are any chances of receiving investments, it is necessary to analyze the position of the enterprise or industry in the market. The attractiveness of any investment project depends on a set of its inherent characteristics. All characteristics of the attractiveness of an investment project can be divided into: objective - these are indicators of the investment project that determine its profitability and riskiness, as well as indicators of the entrepreneurial activity of the party responsible for its implementation, which are based on reliable and complete information; subjective - characteristics determined and formed by the human factor, such as the personal qualities of entrepreneurs, investors, as well as persons who are directly involved in the process and have leverage, their skills and opportunities for establishing partnership relations, the core of which is trust at the psychological level (Boyko, 2018).

So, the procedure for attracting investments in the aquaculture industry can be depicted schematically as follows (Figure 2):

![Figure 2. Procedure for investment attraction](source: compiled by the authors according to (Iermakova O., 2020)).

In order to develop a strategy for the development of the aquaculture industry in Ukraine, it is worth paying attention to the experience of other countries in this matter. In order to understand the factors affecting the aquaculture industry in the economy of other countries, it will be appropriate to start by considering the features of investment attraction in...
the field of blue economy in the EU countries.

The European Union facilitates investment inflows not only by stimulating policies and initiatives, but also by allocating public funding to promote green and blue innovation. This capital is channeled through initiatives and programs under the Multiannual Financial Framework or with its intermediaries, the European Investment Bank (EIB) and the European Investment Fund (EIF). Together, they launch initiatives to increase access to finance by pooling needed resources and providing a de-risking mechanism to attract private investment. Both (EIB and EIF) use a range of financial instruments, such as bonds, guarantees and quasi-equity, to help reduce investment and technology risks associated with many sectors, including the blue economy (Investor report, 2023).

Listed below are the main state funds currently allocated for the promotion of new technologies. Some of them focus more on the green and digital sectors, while others are dedicated to the blue economy. Here are some noteworthy examples:

- "NextGenerationEU", which includes "Recovery and sustainable development", acts as a tool aimed at improving the environmental and digital recovery of Europe after the Covid pandemic (€806.9 billion);
- "European Maritime, Fisheries and Aquaculture Fund" (EMFAF), with a budget of €6.11 billion and aims to promote the sustainable use and management of marine resources and the development of a sustainable blue economy;
- "ETS Innovation Fund" with a budget of 38 billion euros (2020-2030), already finances large-scale demonstration projects in innovative low-carbon technologies, including in the blue economy;
- The "European Innovation Council", created under the "EU Horizon Europe Programme", has a budget of €10 billion to support innovation in areas that may be close to the blue economy, such as renewable energy and biotechnology.

There are many examples of EU activities to improve the investment attractiveness of aquaculture. The above is only a fraction to demonstrate the real state support measures that can stimulate the development of the aquaculture industry. Of course, all indicators of budgeting volumes for the fishing industry must be adapted to Ukrainian realities.

These measures may seem global, since they are implemented not even by a single state, but by the European Union, which includes many highly developed countries, the production volumes of which Ukraine still has many years to go. These types of support for the industry show, in our opinion, that the budgeting tools for the industry are possible both during the war and after its end.

It is proposed to consider the strategy of investing and supporting the aquaculture industry on the example of Croatia, a country that has achieved significant success in this field.

The problems of the aquaculture sector in Croatia (Beyond the Pond, 2021) are quite similar in nature to the problems of aquaculture in Ukraine, except consequences of the war. The main problems are expressed in insufficient use of available resources, as well as in aging, inefficient production, systems and technologies that characterize freshwater aquaculture in Croatia. For example, the production of cold-water salmonids (such as trout) uses conventional flow-through technologies using channels that depend on external water sources. On the other hand, warm water fish production (mostly including carp species) is based on carp ponds that were built in the first half of the 20th century.

Meanwhile, the shellfish industry relies on an extensive production model using suspended structures suspended from the bottom of floating rafts (longer lines), and continuous production is based entirely on the collection of fry from the wild. The shellfish industry also lacks infrastructure, distribution and efficient cleaning centers, hatcheries and an effective marketing strategy. Successful aquaculture production in Croatia will require increased investment in modern infrastructure, production systems and technology. In this context, the industry requires a review of public and private food quality standards, access to financing and overcoming the fragmentation of the industry. Economies of scale are equally important components of increasing farm efficiency and ensuring added value. In addition, increasing production efficiency and increasing added value are closely related to market development. Croatian freshwater aquaculture has historically focused on the production of a limited number of fish species (such as carp and trout), while the Croatian shellfish industry is limited to the European flat oyster and the Mediterranean black mussel.

This production structure limits the sector's ability to respond to changes and consumer demands. It is necessary to focus on the diversification of production in order to breed high-value species. For example, some high-value warm-water species are already grown in very small quantities in carp ponds (e.g. pike perch). In addition, the diversification of production activities (breeding, processing and product diversification)
and the development of a coordinated marketing strategy for Croatian aquaculture products are related strategies with important implications for the production side.

Regarding measures to solve the problems of the fisheries industry, Croatia supports projects focused on aquaculture technologies and solutions that contribute to socio-economic and environmental development. In particular, priority will be given to innovative projects that increase the sustainability and profitability of aquaculture enterprises by using climate-smart and digital technologies and improving environmental management systems for wastewater treatment and processing. Priority projects will be aimed at investing in environmentally sustainable intensification of aquaculture production, including through the integration of digital technologies. Synergistic operations in aquaculture and agriculture are also prioritized, which will include fish production and reduction of aquaculture waste, production of biogas based on fishery waste, processing and disposal of agricultural waste. Another priority area is the introduction of sustainable technological water use and water-saving solutions, as well as production systems with a minimum amount of water, as well as the establishment of cultivation technology and feed management standards that prevent or minimize the introduction of excessive amounts of nutrients into the surrounding water, which deteriorates the environment.

In addition, manufacturers will be awarded for:
- implementation and support of the best management of water resources based on the level of water conservation and discharge of harmful substances;
- optimal strategies for feeding fish and fish nutrition in different types of production systems that use sustainable alternative and non-traditional feeds and supplements.

Importantly, such investment support will be complemented by technical assistance resources to ensure access to public funding for technology transfer, research and innovation provided under various EU support programs such as Horizon Europe. In addition, support will be provided for technology transfer and innovative partnerships involving manufacturers, consultants and scientific institutions. These partnerships will be based on an interactive innovation model where research institutions focus on solving real problems and challenges that manufacturers face on. In order to effectively implement this new innovative model, applications will be developed that will allow a faster response to farmers’ needs and faster delivery of the necessary solutions.

As can be seen, the country that faced problems in aquaculture is already on the way to solving them. The proposed strategy for the development of the aquaculture sector can also find a response in Ukrainian realities. The problems described above are universal and can be solved based on the experience of Croatia in Ukraine or in individual regions. The measures implemented by the Croatian government to improve the general situation of the fishing industry (including attracting investments) can be adapted to the internal economic situation of Ukraine. Thus, looking at the European experience, in the future it is possible to develop a long-term strategy of economic development for the aquaculture industry, or a strategy for the post-war recovery of fisheries.

We also want to emphasize that it is worth analyzing the experience of aquaculture development not only of entire countries, but also of individual enterprises. It is private enterprises that most often achieve high production efficiency through stabilization, development, innovation and other ways of increasing profits.

For example, it is worth considering the introduction of new technologies in fish farming using the example of the Indonesian company "eFishery" (Novogratz, 2023). Indonesian aquaculture technology company "eFishery" raised 200 million USD, becoming the first startup in the global aquaculture industry to be valued at more than 1 billion USD. The rise of “eFishery” is a story about the role technology can play in transforming aquaculture into a cleaner, greener and more transparent industry. This large digital community of farmers acts like the world's largest agricultural cooperative, providing access to smallholder farmers.

“eFishery” has developed one of the first affordable technology solutions for fish farmers and shrimp farmers. Started in 2013 as a smart feeder company that uses sensors to measure water movement for fish and acoustics for shrimp to optimize feeding and improve fish health. High water quality while simultaneously reducing waste is one of the biggest problems in aquaculture, where feed accounts for 70% of emissions (mostly carbon). “eFishery” uses data and technology from its intelligent feeding device to improve fish and shrimp farming operations. The result is achieved through a better understanding of productivity at the farm level through:
- improved access to local and global fresh food and feed markets for better pricing;
- improved availability of "inputs" and
“outputs” of the farm on the market;
- improved access to financing.

All this contributes to improving farmers’ practical skills, production volumes, profitability and livelihoods.

Initially focusing on feed optimization and farm data collection, “eFishery” soon realized that 98% of their farmers did not have access to feed. With their data, they were able to make accurate predictions about how much of a particular feed their farming network would need in the future, so they could pre-order those volumes directly from feed manufacturers to offer competitive prices for their own products. As a result, they can offer feed for about 5% less than the prices farmers were previously paying, and hope to increase this to 10% as sales increase. Their own feed marketplace (eFisheryFeed) became the largest feed distributor in Indonesia within months of launch.

That is why this company deserves attention. Their approach to increasing the efficiency of fish farming enterprises is quite economically beneficial, socially significant and ecologically clean. It is quite possible to integrate this experience into the production structure of fisheries enterprises in order to increase their international competitiveness, investment attractiveness and general economic condition.

Investor interest in sustainable aquaculture has been growing over the past few years, but they still see the industry as complex and unknown. The success of “eFishery” is one of the few examples of the company’s successful innovation and investment activities in the field of aquaculture.

Conclusions and perspectives of further research. From the conducted research, it can be concluded that the aquaculture industry is currently in a state of crisis. But, at the same time, it has potential for development and investment attraction. The study proposed the procedure necessary to implement the mechanism of investing in an enterprise or industry, as well as organizational and economic mechanisms that have proven their effectiveness in foreign countries.

In the global economic system, foreign investments are an important economic lever. In view of this, the state needs to create and gradually implement a comprehensive system of state management of investment processes, which would provide for the implementation of interconnected economic, legal, organizational and informational measures aimed at attracting capital from abroad.

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