РУШІЙНІ СИЛИ ВІДРОДЖЕНЯ РИБНОГО ГОСПОДАРСТВА І РОЗВИТКУ АКВАКУЛЬТУРИ В УКРАЇНСЬКОМУ ПРИЧОРНОМОР’Я

Актуальність. Сучасні трансформації, пов’язані з радикальними змінами в системі міжнародної та національної безпеки, у тому числі зумовлені зростанням дефіциту продовольчої продукції та загрозою голоду, визначають зростаючий потенціал проблем продовольчої безпеки як на міжнародному рівні, так і на національному. Дану проблему все більшою мірою актуалізує і для України, яка здобула значну вагу у вирішенні проблем продовольчої безпеки через її рибогосподарський потенціал.

Мета та завдання. У цій роботі ставиться за мету розглянути деякі базові теоретико-методологічні та прикладні аспекти мобілізації природно-ресурсного потенціалу та економічних активів рибогосподарського сектору економічної системи України.

Матеріали та методи. У цьому досліджені використовувалися національні нормативно-правові матеріали, що визначають державну політику у сфері розвитку агропромислового комплексу, рибного господарства та аквакультури, зокрема, закон України «Про аквакультуру», а також зарубіжні матеріали, що відображають сучасні проблеми продовольчої безпеки.

Результати. У роботі представлено результати теоретико-методологічних обговорень та прикладних аспектів формування нового рибогосподарського комплексу України. Досліджено перспективи його відродження пов’язаного з мобілізаційною моделью розвитку континентальної аквакультури та морською культурую відродження (марикультуру). Особлива увага звертається на рушійні сили відродження національного рибного господарства та аквакультури.

У роботі рушійні сили визнаються як інтегрована сукупність двох базових складових: потреб та інтересів суспільства у виробництві рибогосподарської продукції; наявності та можливостей ефективної реалізації ресурсів та активів держави.

Висновки. Теоретико-методологічні підходи, що обґрунтовуються в роботі, до активізації рушійних сил розвитку аквакультури слід розглядати як важливий науково-прикладний баг відродження рибного господарства та аквакультури в Україні в контексті зростаючої соціально-економічно-екологічної конфліктності, у тому числі зумовленої військовою агресією Росії. Звертається увага на те, що Україна має дуже великий природно-ресурсний потенціал як для виробництва сільськогосподарської продукції, так і продукції рибогосподарського сектору економіки. Як фоно розвитку та розпруту рибного господарства та його перспективного ключового сектору – аквакультури та маркультури розглядається морська берегова зона у взаємозв’язку з водогосподарським потенціалом приморських регіонів України.

Ключові слова. Продовольча безпека, рибогосподарська система, аквакультура, рушійні сили, ефективність.

STEPANOV V.N.
Dr. Tecon. Sd., Professor, Chief researcher
State Institution «Institute of Market and Economic&Ecological Research of the National Academy of Sciences of Ukraine»
French Boulevard, 29, c. Odessa, Ukraine, 65044
E-mail: stepanov.ipr@gmail.com
ORCID: 0000-0001-5432-1115
DRIVING FORCES OF THE REVIVAL OF FISH FARMING AND THE DEVELOPMENT OF AQUACULTURE IN THE UKRAINIAN BLACK SEA COAST

**Topicality.** Modern transformations associated with radical changes in the system of international and national security, including those caused by the growing shortage of food products and the threat of famine, determine the growing need for a new understanding of food security problems both at the international and national levels. This problem is becoming more and more relevant for Ukraine as well, which was mostly exacerbated as a result of Russia’s military aggression. One of the important assets of Ukraine in terms of solving food security problems is its fishing potential.

**Aim and tasks.** This work aims to consider some basic theoretical, methodological and applied aspects of mobilization of natural resource potential and economic assets of the fishery sector of the economic system of Ukraine. At the same time, the main task of solving the specified target problems in the work is the system generalization and program-target organization of driving forces that can really be mobilized in the direction of the revival of fisheries and the development of aquaculture in Ukraine.

**Materials and methods.** This study used primarily national regulatory and legal materials that determine state policy in the field of development of the agro-industrial complex, fisheries and aquaculture, in particular, the Law of Ukraine “On Aquaculture”, as well as foreign materials reflecting modern food security problems.

In terms of methodological support of the research, the author paid attention to the possibilities of using modern apparatus for the study of complex developing systems in conditions of crisis transformation, as well as modern ideologues of such scientific areas as conflictology, riskology, theory of nonlinear systems.

**Research results.** The work presents the results of theoretical and methodological discussions and applied aspects of the formation of a new fishery complex of Ukraine. The long-term prospects of its revival are associated with the mobilization model of the development of continental aquaculture and marine culture of reproduction (mariculture). Particular attention is paid to the driving forces of the revival of the national fishery and aquaculture.

In the work, driving forces are defined as an integrated set of two basic components: the needs and interests of society in the production of fishery products; availability and possibilities of effective implementation of state resources and assets.

**Conclusion.** The theoretical and methodological approaches discussed in the work to the activation of the driving forces of aquaculture development should be considered as an important scientific and applied basis for the revival of fisheries and aquaculture in Ukraine in the context of growing socio-economic and ecological conflict, including those associated with military aggression of Russia, attention is drawn to the fact that Ukraine has a very large and favorable natural resource potential both for the production of agricultural products and products of the fishery sector of the economy. As an outpost of the revival and development of the Ukrainian fishery and its promising key sector - aquaculture and mariculture - the sea coastal zone is considered in relation to the water management potential of the coastal regions of Ukraine.

**Keywords.** Food security, fisheries system, aquaculture, driving forces, efficiency.

**Problem statement and its connection with important scientific and practical tasks.** The analysis of modern problems of exacerbation of food problems is increasingly updated. In this context, this work is devoted to the urgent problem of the development of fisheries and the related aquaculture sector in Ukraine. The source for setting this task is the proposal put forward by the Department of Economics of the National Academy of Sciences of Ukraine to develop a scientific justification for the development of aquaculture in the country, the need for which is dictated by the factor of a steadily increasing aggravation of food problems both at the national (Ukrainian) and international levels.

This is a consequence not only (and not so much) of the consumption growth factor, but to a large extent - a factor of various conflicts, crises and wars.

This work takes into account the following:

a) the prospects for domestic aquaculture, using natural and artificial continental (freshwater) reservoirs and streams, provided mainly by fish farming, are predetermined by the following potential: rivers - 63 thousand, lakes - 40 thousand, rates - 400 thousand, reservoirs - 1100;

b) marine aquaculture (mariculture) developed in the coastal waters of the Black and Azov Seas, as well as estuaries and lagoons, can provide the cultivation of fish, algae, microalgae, molluscs and other organisms;

c) artificial cultivation of various bioorganisms (aquacultures) in the general fisheries system of Ukraine provides only 18.6 thousand tons of marketable products with a total fish consumption of 470 thousand tons (4.6%) per year (2020).

We consider aquaculture in a broad sense of its complexities not only as a sphere of economic human activity, but also as a system of complex knowledge, reflecting its objective nature as a complex developing system that must be considered in the multidimensional dimension of biological, environmental, economic, social and other sciences.
In this regard, we should talk about the formation of the economic-ecological (econological) sphere of knowledge in the field of aquaculture, which is at the initial stage of its development (at present, there are no major fundamental works such as "econology of aquaculture").

At the present stage of its formation, Ukraine found itself in very difficult internal and external conditions. Over the past 30 years, the development of Ukraine has been accompanied by a number of objectively and subjectively determined socio-economic, environmental, scientific, technical and other crisis situations, which are discussed in detail in the scientific report of the Institute of Sociology of the National Academy of Sciences of Ukraine (Petrushina T., Arseenko A., Butkalyuk V., 2020). Overcoming these crisis situations, which limit the socio-economic progress of the state, is largely hampered by such phenomena as the global pandemic (Covid-19) and the war unleashed by Russia against Ukraine.

These phenomena in the development of Ukraine actualize the formulation of problems of ensuring socio-economic security and national security in general, affecting such areas as food security, overcoming poverty, environmental security, etc.

Due to the fact that this problem, exacerbated by Russia's military actions, damages the food potential not only of Ukraine, but also of many countries of the world dependent on Ukrainian supplies, is a problem of special attention as the President of Ukraine V.A. Zelensky, and the Government of Ukraine, in particular, the Ministry of Agrarian Industry and Food of Ukraine, the Ministry of Foreign Affairs of Ukraine, etc.

Actualization and principles for solving the above problems of national security of Ukraine are formulated in the "Concept (fundamentals of state policy) of national security" and in the Law of Ukraine "On the Fundamentals of National Security of Ukraine". At the same time, it should be emphasized that these food problems are aggravated every year not only for Ukraine, but for the whole world and acquire the character of stable trends.

In the Human Development Report 2016 (Human Development Report 2016), which experts refer to as one of the latest and most important global human development reports published by the United Nations Development Program (UNDP), priority is given to the problem of overcoming hunger and poverty in the system of 17 goals in the field of sustainable development.

In recent years, in the system of solving the problems of ensuring food security, considered in the context of internal and external interests of Ukraine, more and more attention is paid to the development of fisheries in general and, in particular, the development of aquaculture. National and regional interests in these areas are reflected in the relevant laws of Ukraine.

In this paper, we propose to develop some basic foundations for scientific justification and applied aspects of the development of the aquaculture sector in conjunction with the development of fisheries, which are interdependent and inseparable elements of the overall fishery complex of Ukraine. At the same time, the problems of the development of fisheries and aquaculture in Ukraine are considered in the spaces of the sea coastal zone as an area of a higher level of concentration of production (sea fishing, mariculture, scientific centers) and the Ukrainian Black Sea region as an area of active development of aquaculture and a subject of the maritime economic complex of Ukraine.

The formulation of these tasks is considered in the context of the Maritime Doctrine of Ukraine, the decision of the National Security Council of Ukraine, related to the development of Ukraine as a maritime power and the strategic imperatives for the revival of Ukraine as a maritime power, formulated in the works of the IREEI NAS of Ukraine.

Analysis of recent publications on the problem. In recent years, many scientists and specialists have addressed the problems and prospects for the development of fisheries in Ukraine and its important sector - aquaculture and mariculture. Among them, first of all, should be attributed the works of I.Yu. Kireeva, O.O. Reshetova, V.A. Samofatova, A.A. Boyko T.V. Beloshapka, E.G. Bushueva, V.V. Gubanova, O.V. Demchuk, E.F. Eremenko, S.A. Koziy, E.S. Kolesnikova, M.P. Kulbida, V.V. Ushakova and others devoted to the problems of developing a strategy for the development and management of the country's fishery complex.

However, the solution to the problems of aquaculture development in Ukraine is constrained not only by the complexity of the socio-economic situation in the country, but also by the unresolved nature of a number of scientific and applied problems.

Allocation of previously unsolved parts of the general problem. In our opinion, the general scientific and applied problem of the revival and effective development of fisheries and aquaculture in relation to the difficult conditions of Ukraine
actualizes the need for a new methodological understanding of the methods and methods for solving practical problems of the domestic fishery complex, as an important factor in ensuring national security and fulfilling Ukraine's international obligations to ensure food security. In this regard, it is essential to develop scientific and applied bases for identifying and mobilizing the driving forces for the development of fisheries and aquaculture in Ukraine.

Formulation of research objectives (problem statement). Based on the increasing relevance of the constantly acting factor of food shortages, poverty and hunger in many regions of our planet, including those affecting the interests of not only poor countries, but also developed and developing countries, including Ukraine, the goal is to consider some methodological and applied aspects intensifying the development of promising areas for ensuring food security. In this regard, the task was set to pay attention to the driving forces for the development of fisheries and its important direction - aquaculture in Ukraine. As an object of application for solving this problem, the Ukrainian Black Sea region is considered, which has the greatest natural resource and socio-economic potential for the corresponding purpose.

Materials and methods. This study used primarily national regulatory and legal materials that determine state policy in the field of development of the agro-industrial complex, fisheries and aquaculture, in particular, the Law of Ukraine "On Aquaculture", as well as foreign materials reflecting modern food security problems.

In terms of methodological support of the research, the author paid attention to the possibilities of using modern apparatus for the study of complex developing systems in conditions of crisis transformation, as well as modern ideologues of such scientific areas as conflictology, riskology, theory of nonlinear systems.

An outline of the main results and their justification. The undoubted axiom of the development of a person and the human community as a whole is their needs and interests, which can be interpreted both as the main categories of the sociological theory of human development and as the main driving forces of human development.

Among the eternal and timeless human needs are biological needs - oxygen, water, food, etc. Social, spiritual and other needs are historically emerging needs. To the question “what moves people”, the French materialist philosopher Claude Helvetsy (1715-1771) argued that “hunger and love rule the world”.

This link, considered within Maslow’s pyramid of needs, is put by us in solving the problem of forming a system of driving forces for the development of fisheries and aquaculture in Ukraine as an important factor in the production of valuable products and in solving certain problems of food security.

As is known, the driving forces of the development of society are understood as essential, necessary and long-term causes that ensure the functioning of socio-economic progress (Melnik L.G., 2012; Rushyni forces and subjects of the suspensory development, 2018). The main driving force behind the development of the economy is: the contradictory interaction between production and consumption; the contradiction between the productive forces and production relations; person, needs, incentives, interests, etc.

In modern economic literature, an analogue of “economy drivers” that is close in content to “driving forces” is often used (Global Material Resours Outlook to 2060, 2020).

In the conceptual and categorical view, “drivers of the economy” are considered as catalysts for economic growth, ensuring sustainable formation of economic stability in all sectors based on the organization of multi-level ties and cooperation.

Based on the foregoing, we will formulate some of the most significant provisions for the formation of the definition of the driving forces for the development of the fisheries (FA) and the aquaculture sector (AK) in Ukraine.

In this regard, the driving forces for the development of RH and AK are defined as an integrated set of:

a) the needs and interests of society in the production of products of RH and AK;

b) availability of opportunities and effective implementation of resources, potentials and assets of the state.

The fractal model of the system-parametric representation of the driving forces of the development of RH and AK that we have formulated is shown in Fig. 1. The detailing of the driving forces in this system by significance levels is summarized by us in Table 1.
Fig. 1. Fractal model of system-parametric representation of needs and interests driving fisheries development and aquaculture sectors of Ukraine

PPS - prosperous and prosperity of the state
A; B; C – modules of national needs and interests;
The content of levels 1-4 is formulated in Table 1.
IPI - individual needs and interests.
Source: Table author's development.

Table 1

<table>
<thead>
<tr>
<th>Importance levels</th>
<th>Defining needs, interests and potentials</th>
<th>Content of needs and interests</th>
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<tbody>
<tr>
<td>1</td>
<td>Welfare and Prosperity of the State (BPS)</td>
<td>The survival of Ukraine as a free and independent state, the protection of its fundamental values and the security of the population.</td>
</tr>
<tr>
<td>2</td>
<td>Main modules of national needs and interests (A, B, C)</td>
<td>A - increasing the sustainability of the development of Ukraine and its regions on the principles of humanization of society and the economy, the effective use of Ukraine's natural resources in the interests of the well-being of the people; B - improving the socio-economic and environmental quality of life of the population, including increasing the level of material goods and services, health, human ecology and the moral and psychological climate; C - increasing the creative abilities of a person, society as a whole, as a subjective condition for the successful implementation of a certain type of activity.</td>
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<tr>
<td>3</td>
<td>Integrated natural resource potential for the development of fisheries and aquaculture in Ukraine</td>
<td>1) Consolidation into one whole resource system; natural resources, their ordering, structuring in order to effectively develop the fisheries and aquaculture sectors; 2) Theoretically, the limiting amount of natural resources that can be used in the conditions of the programmed development of fisheries and aquaculture in Ukraine.</td>
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<tr>
<td>4</td>
<td>Institutional capacity for fisheries and aquaculture development</td>
<td>Government institutions, national science and education (National Academy of Sciences of Ukraine, higher educational institutions), mass media, public and non-governmental environmental organizations.</td>
</tr>
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Source: Table author's development.
In addition to the above driving forces for the sustainable development of fisheries and aquaculture in Ukraine, one should take into account the very important role of the institutional basis of the state, which includes both a form of social structure and relations, and a set of norms and rules of social relations.

In modern science, the institutions of sustainable development, as a rule, include the following structures and subsystems (Melnik L.G., 2005):
1) science that generates innovations (academic, university, industry, etc.);
2) representative legislative institutions (parliaments) that establish the “rules of the game” in the system of innovative development;
3) the banking system that regulates the distribution of resources;
4) a rational bureaucracy responsible for managing rapidly changing social processes;
5) an independent court that regulates intra-system conflicts;
6) the system of mass communications (free press).

The first three subsystems are defined as the basic “meta-institutions” of modern society; the second group of subsystems is defined as the “support institution”.

We consider it necessary to emphasize that special development factors that play the role of specific driving forces of development should be taken into account. These should, first of all, include: the political and economic consolidation of society, spiritual driving forces, first of all, the national idea, civic patriotism, the strengthening of the importance of the human factor - the active creative activity of each person, his consciousness, responsibility (Gavrilishin B.D., 2006; Polunev Y., 2006).

In the final part of this work, we consider it necessary to emphasize that as the main springboard for the revival of the fishery complex of Ukraine and its important sector of aquaculture and mariculture, we will determine the sea coast of Ukraine, which in a broad sense is considered as a geographical and historical region - the Ukrainian Black Sea region, which includes the Odessa, Mykolaiv and Kherson regions, as well as the Autonomous Republic of Crimea.

Conclusions and perspectives of further research. The above considerations in this paper on the development of fisheries and aquaculture in the Ukrainian Black Sea region, as one of the important factors in solving food problems at the national and international levels, give grounds to draw the following conclusions:

1. For Ukraine, which has a very large and favorable natural resource potential both for the production of agricultural products and for the production of fisheries and aquaculture (mariculture), there is a historical chance, on the one hand, to take a special place in solving international food problems and become one of the leading global players in the world food market, and on the other hand, to become a full-fledged object of obtaining very significant funds from this market (about 5.9 trillion dollars by 2035).

2. One of the constraining problems in the development of fisheries in Ukraine is the lack of a system for its long-term planning, including program-targeted nature. Taking into account the growing need for food both at the national and international levels, it is essential to develop a state program for the development of fisheries, including aquaculture, for a period of at least 15-20 years. This program will require very significant material and financial resources to create an infrastructure that meets the goals and objectives, build a fishing fleet, scientific and technical base for solving a large number of environmental problems, etc., which have become much more complicated due to Russia's military aggression against Ukraine.

3. As a real source of financing for this strategic direction of the economy, one should consider financial resources that are planned to be transferred to Ukraine of part of the frozen assets of Russian banks. Western countries, as anti-Russian sanctions for military aggression against Ukraine, froze almost half of all Russia's gold and foreign exchange reserves, the volume of which before the sanctions was about 640 billion US dollars.

4. As an outpost for the revival and development of domestic fisheries and its key sector - aquaculture (mariculture), the sea coastal zone of Ukraine should be considered in conjunction with the coastal regions of the state, defined as the Ukrainian Black Sea region. Such a formulation of the question is due to the historical fact that the coastal zone of the Black and Azov Seas has always served as a springboard and stronghold for the development of the maritime economy and the economy of Ukraine as a whole, international relations and ensuring the national security of Ukraine.

The domestic maritime complex, tied to the sea coastal zone, provided Ukraine with a high status of a world maritime power. In the system of the MHK of Ukraine, a particularly important place has always been occupied (along with sea transportation) by fishery production (extraction, processing, trade).
5. The state policy for the development of the fisheries and aquaculture sector of Ukraine should be considered in conjunction with the development of an integral program for the revival of Ukraine as a maritime power, the need for which was discussed at the level of the Verkhovna Rada of Ukraine back in 2009.

6. In order to identify possible approaches and ensure the effective integration of Ukrainian fisheries and aquaculture into the system of the international division of labor, it is imperative to conduct a comprehensive study of Ukrainian competitive advantages across the entire sector of enterprises, technologies and individual products. This will help avoid investing in obviously inefficient economic facilities.

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