

Organization of a unified digital platform in sustainable fisheries of the fishery complex

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Abstract. The actual issue of modern digitalization of the development of the fishery complex of the Russian Federation is the cardinal transformation of economic, scientific, technical, legal, production technological, production relations with digital platforms. The fishery complex as one of the important and integral parts of the country's economy, providing the population with food and forming food security of the state, the main consumers of the products of most interrelated sectors in technological, economic and organizational fields of the economy. Intensive use and consumption of natural resources in order to maintain human civilization due to the limited nature of these resources cannot develop without proper regulation, both at the federal and regional levels. "Sustainable" fishery is a guarantor of food security of any country, and digitalization is essential.

1 Introduction

At the moment, digital, information and communication technologies are being introduced into all sectors, including the economy. In modern conditions, one of the key areas of Russia's activity is the digitalization of the country with a focus on the digital economy. Digitalization has a great impact on the economic entities of the state.

With the increasing use of digital innovative technologies in all sectors, economic activity is transformed and optimized by information flows. This inevitably leads to changes in processes and structures and indicates the need to introduce digital technologies in all sectors of the modern economy. Increasing the productivity of the country's fishery complex is inextricably linked to the further development of productive forces and production relations, which are deeply transformed in conditions of digital technology penetration in all spheres of production, household, social and public activities. The structure of the digital economy based on technology contributes to a significant increase in the efficiency of solving socio-economic problems of the fishing industry of Russia.

The transition to the digital economy in the Russian Federation is hampered by a combination of unfavorable external conditions and deteriorating relations with the countries that are leading in digitalization, resulting in sanctions pressure and barriers to innovation exchange. To overcome these challenges, it is necessary to stimulate the activities of domestic IT companies, motivate information specialists and create a unique technological and intellectual base for digitalization.

The country is facing a fundamental transformation in technical, technological, organizational and economic infrastructure, as well as in social life, including business, in which economic actors operate in all spheres of the economy. The digital transformation of the production, auxiliary and service sectors of the economy, in particular the fishing industry, will lead to the creation of new forms of interaction and communication between economic actors and contractors in an open and transparent digital environment. The transformation will affect organizational structures and management functions, improving the systematization and efficiency of decision-making to increase production efficiency and reduce risks and resource losses.

At the moment, the level of development of the fishery complex of the Russian Federation is determined, on the one hand, by stable catch (extraction) of aquatic biological resources, domestic production of fish products, commercial aquaculture (fish farming), saturation of the domestic market and reduction of imports. This indicates the high potential of the fishery complex. On the other hand, the number of people who illegally consume too much seafood or fish has increased worldwide, which causes various problems. If this situation continues, there is a risk that fish resources will decrease. Therefore, we believe that as a solution to this problem, we need to "promote sustainable fisheries" and actively introduce digitalization into this institution. To begin with, it is necessary to understand the designation of sustainable fisheries and what is included in it.

Sustainable fisheries are fisheries and aquaculture industries that care for fishery resources and the environment; they follow and apply established regulations on fish catches and the extent of fishing.

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Sustainable fisheries include:

1. preventing the rapid decline and depletion of marine resources;
2. restoring the marine environment and ecosystems;
3. helping in protection of marine habitat and endangered species;
4. stabilizing fishermen's livelihoods;
5. preventing forced labor.

Today there are many organizations that promote sustainable fisheries. One of the best known is the Marine Stewardship Council (MSC). The organization believes that sustainable fisheries should take into account three principles.

The first is resource sustainability, which is not overfishing or depleting fishery resources, but also seeking to fish in a way that proves that depleted fishery resources can be recovered.

The second – "ecosystem impacts of fisheries" – refers to fishing in a way that maintains diversity, productivity, and other factors while taking into account the structure of the ecosystem on which the fishery depends.

The third is the "fisheries management system" ensuring that the management system in place is consistent with the above principles and respects national, regional and international regulations. It is necessary to establish systems to realize the sustainable use of resources.

According to the Food and Agriculture Organization of the United Nations (FAO), in June 2022, global seafood production in 2020 was 214 million tons and consumption reached a record high of 157 million tons. Per capita consumption of seafood has also increased from 9.0 kg in 1961 to 20.5 kg in 2019, and demand will continue to rise as the population is expected to continue to grow.

The per capita supply is expected to reach 21.4 kg by 2030 due to such factors as interest in health, nutrition-oriented diets and changes in distribution.

However, globally, 35.4 percent of seafood stocks are above sustainable levels, and it is overfished. If the catch is too large, moreover, during the breeding season, during the spawning season, the offspring will be insignificant. If this situation continues, fish resources could be depleted, leading to a food crisis in the fishing industry.

Against this background, the expansion of aquaculture has been encouraged in recent years.

Offshore catches in 2020 were 90.3 million tons, 4% below the average catch in the last three years, but aquaculture production (excluding algae, etc.) was 87.5 million tons, 6% higher than that in 2018. Aquaculture, which is resource-efficient and can sustainably produce seafood at reasonable prices, plays an important role in balancing supply and demand.

Nevertheless, aquaculture must be done in an environmentally and socially sound manner.

- without water pollution caused by food residues
- without environmental destruction occurring during construction of fish farms

- use of medications and chemicals to prevent the onset of disease and parasites;
- without forced labor that forces workers to work overtime and work hard.

This will increase pressure on the marine environment, ecosystems and workers.

For this reason, it is necessary to restructure seafood production, management, trade and consumption in a sustainable manner through Blue Transformation.

"Blue Transformation" is an initiative increasing the capacity of seafood food systems and ensuring sustainable food supply in the face of global population growth. It has three objectives: expanding and strengthening sustainable aquaculture, effectively managing all fisheries and modernizing the value chain.

This blue transformation is also mentioned by FAO in its flagship report on the current state of fisheries and aquaculture, and, working on:

- supporting the supply of sufficient aquatic bio food for a growing population in an environmentally sustainable, socially and economically viable manner;
- ensuring the availability of safe and nutritious food from aquatic bioresources for all, especially the vulnerable, and reduce food loss and spoilage;
- ensuring that water food systems contribute to improving the rights and incomes of the communities on which they depend and ensuring equitable livelihoods;
- supporting the sustainability of aquatic food systems that are significantly affected by human and environmental dynamics such as climate change.

Sustainable fisheries, positioned as an ecological alternative to commercial fisheries, are more an example of successful greenwashing. Once at sea, it is almost impossible to control a fishing vessel. Many countries now have a special labeling system for seafood and fish, which is supposed to reassure the consumer that no other sea creatures have been harmed in the catching of fish. The problem is that the compliance with these conditions is monitored by organizations that get profit from the sale of labeled goods. A conflict of interest arises, as the financial profit of the organization directly depends on the number of sold packages.

The volumes of caught fish in circumvention of the law are huge: these are figures from 8 to 14 million tons per year. Supermarkets, cafes and restaurants often sell cheaper seafood and fish under the guise of expensive ones. A study in more than 30 countries found that 36% of seafood products were mislabeled. Illegally caught fish is often sold under the guise of legally caught fish by mixing illegally and legally caught fish; companies make more money from sales.

It has long been thought that one option for solving the problem and protecting the oceans is to develop farms where fish are raised under controlled conditions. However, this is not the case; such farms require wild-caught, dried and ground fish to feed the fish. To raise one kilogram of salmon in a fish farm, it needs to feed 2.5 kilograms of caught fish. In addition, intensive feeding regimes are very damaging to the environment. On many farms, the fish are fed automatically, and much of the feed is collected at the bottom along with the

ammonium-rich waste products of the salmon. It is estimated that a 1,000-ton salmon farm – small by current industry standards – pollutes water as much as a city of 20,000 people.

There is no quick and easy solution to the problem of fish extinction and the destruction of the ocean ecosystem; many regions depend directly on the income from the sale of fish. However, if we pay at least as much attention to the amount of seafood we consume as we do to the amount of meat we eat, and control it, the ecological catastrophe can be stopped. In parallel, we need to increase the number of protected ocean and marine areas, allowing ecosystems to recover, and strictly enforce sustainable fisheries regulations. For example, using blockchain technology is one way to manage sustainable fisheries. With its ability to provide traceability and transparency, blockchain can be an invaluable tool in preserving global fisheries.

By utilizing blockchain, the seafood industry can create a safer and more secure system for tracking the origin of seafood. This is critical to ensure that seafood comes from sustainable sources. It also helps ensure that seafood is safe, legal and traceable, with the ability to trace the source of production.

An important condition is not only the tracking of fish catch with the help of digital technologies, whose number today is sufficient. All of them do not give concrete results in solving the problem, as if there was only one digital platform that regulated all processes in a "single window". Undoubtedly, all this is impossible without legal regulation in this area. As we see, there are contradictions of regulatory legal acts of the federal level relatively the regional level, the lack of new approaches and mechanisms to improving the fishery complex. Hence, the unified fisheries management is undermined by the imbalance of interests between organizations, end users of seafood and national management bodies, which weakens the system of fisheries management and control in fisheries.

2 Materials and methods

The main material for the study and identification of problems of organization of a unified digital platform in sustainable fisheries of the fishery complex was theoretical works, as well as normative legal acts in the field of digital economy of the fishery complex.

The research used analytical, statistical, comparative, logical analysis of scientific publications and achievements reflecting the process of sectoral digitalization of the economy. Information sources included statistical and informational data of the Government of the Russian Federation, Ministry of Agriculture, Rosrybolovstvo, Rosstat and others.

For example, the Decree of the President of the Russian Federation "On the Strategy for the Development of Information Society in the Russian Federation for 2017-2030" dated 09.05.2017 N203 [1] for the first time gives the concept of "digital economy". So this term is defined as a special type of economic activity characterized by a digital data format, which is

the main factor of production. In addition, the digital economy is characterized by the processing of large amounts of data.

The Decree substantiates the feasibility of a transition from the traditional economy to the economy based on digital technologies. In contrast to the traditional economy, the mechanism allows for a significant increase in productivity in the areas where they are applied.

In addition to the above-mentioned normative act, the issues of application of digital economy technologies are also addressed in the project of the Ministry of Agriculture of the Russian Federation "Digital Agriculture". It became the launching pad for the creation of the National Digital Public Agricultural Platform of the same name [2].

This project defines the term "digital agriculture" meaning agribusiness activities that are based on the legalization of domestic business processes that enable agricultural enterprises to increase productivity and reduce production costs.

Therefore, the Strategy for the development of agro-industrial and fishery complexes of the Russian Federation for the period until 2030 formulates the main development goals. And the State Program "Development of the fishery complex" differs from the national project by a system of measures (interconnected by tasks, implementation time and resources) and tools of state policy that ensure the achievement of priorities and goals of state policy in the sphere of socio-economic development and security. The main difference is that in the implementation of national projects, specific tasks are set, the level and volumes of additional resources that are necessary to solve the set tasks are specified, responsible persons are determined [10].

The establishment of a unified agribusiness and fisheries digital platform by 2030 will provide the real-time information needed to make certain coordination and management decisions. But how this digital platform will function and whether the implementation of a blockchain mechanism for tracking sustainable fisheries catch is under development.

At the moment, legislation is not fully able to cover all technological innovations. For example, a legal definition of blockchain technology has not yet been introduced. The solution of socio-economic tasks that provide a clear structure and development of digitalization of "sustainable" fisheries as a factor of food security is a strategic goal of the state policy in the field of fishery complex.

3 Discussion of results

In modern conditions, one of the key directions of Russia's activity is the digitalization of the country with a focus on the digital economy [4]. The modern market requires flexibility from organizations. Flexibility is understood as the ability to quickly adapt to new requirements in various areas of activity [5].

Unfortunately, digital solutions have not yet become the basis for building cross-sectoral economic

interconnections. At the same time, the positive dynamics of financing digital transformation activities within the framework of government programs allows us to hope for the removal of this limitation and the creation of conditions for a "digital breakthrough" of the Russian economy. In this respect, the management of the digital transformation process in RCC through the creation of a unified digital platform is quite consistent with the basic principles of digitalization.

Due attention should be paid to the revision of the Strategy, which is caused, in particular, by qualitative changes in the external and internal conditions of the functioning of both the economy in general and the fishery complex in particular.

Various scenarios should be taken into account, including funding reductions.

One of the stated goals of the strategy is to increase the volume of exports. But even with an optimistic forecast, as shown in the Strategy of indicators, self-sufficiency in all major products is fulfilled by 100%.

New macroeconomic factors do not take into account the availability of human consumption of fishery products, mainly in terms of prices and assortment, and diversification in the use of fishery products.

The strategy does not take into account cross-sectoral activities (transportation, trade), which provide solutions to the problem of food security of the population. It also does not take into account sustainable fisheries.

The above requires a change in the regulations.

4 Conclusion

Today, information technologies have rapidly entered and firmly settled in other spheres. It is no longer surprising to see electronic records in health clinics and financial and credit institutions [3]. Artificial intelligence (AI), cloud technologies, blockchain, big data are penetrating deeper into all spheres of economic and social life; they are used for data processing, as well as other purposes [6]. It is rightly stated that the achievement of digital transformation goals largely depends on the level of digital maturity of industries and the factors that determine its achievement [7]. The degree of digital maturity can be judged by the quantity and quality of digital technologies, successfully introduced to different sectors of the fishery complex. For sustainable fisheries, it is necessary to create a unified platform for the fisheries sector by tracking fish catch with blockchain [11–14].

Blockchain can be used to protect the security and integrity of data and to create a secure platform for trading. This could help reduce the risk of illegal, unreported and unregulated (IUU) fishing and other fraudulent activities in the fishing industry.

In addition, blockchain technology can improve fisheries management. It could be used to monitor the fishing fleet, track catches and create a safer and more reliable system for controlling the size of fish stocks. This could help reduce the impact of overfishing and protect vulnerable species [15, 16].

Finally, blockchain can also be used to improve access to finance for sustainable fisheries. Providing an immutable and secure system for tracking the origin and value of seafood makes it easier for producers to access finance and reduce the cost of seafood [17–19].

In general, the potential of blockchain technology for sustainable fisheries education is enormous. It could provide a secure, transparent and traceable system for managing seafood, protecting data security and integrity, improving fisheries management and providing access to finance.

The global fishing industry is in crisis. The industry suffers from a lack of transparency and lack of traceability in the supply chain, leading to illegal fishing and unsustainable fishing practices [20].

Blockchain technology is a secure, decentralized digital ledger system that allows you to track and trace products throughout the supply chain. It can be used to store and verify data on the origin and movement of goods in the supply chain.

The seafood industry is using blockchain to create traceable and verifiable records of fish from catch to sale. This allows companies to track the journey of their products from sea to plate. It also helps ensure that all seafood is caught and harvested legally, and that all fish is traceable back to its original source [21, 22].

In addition, blockchain technology can be used to create "smart contracts" that can automatically enforce fishing rules and regulations. For example, a smart contract can be programmed to ensure that the fishing fleet complies with quotas and other restrictions designed to protect endangered species.

Finally, blockchain technology can be used to facilitate the implementation of catch shares, which are a type of a fisheries management system that allocates a certain percentage of the total catch of a fishery to certain individuals or groups. Catch share programs are an important tool for ensuring that all stakeholders in the fishing industry have an equal stake in the success of the fishery. It helps ensure that fishing practices are sustainable and that endangered species are not impacted [23].

In view of this, blockchain technology offers a powerful tool to improve fishing practices and protect endangered species. By providing a secure and transparent ledger for recording data, enforcing regulations and managing catch shares, blockchain technology can help ensure the sustainability of the fishing industry and prevent adverse impacts on endangered species.

To summarize, it can be concluded that our country needs the development and implementation of digital technologies. For better and stable operation of the fishery complex, a unified digital platform with a system for tracking the catch of fish products is needed. For this purpose, it is also necessary to establish a clear understanding of the term "blockchain" at the legislative level.

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