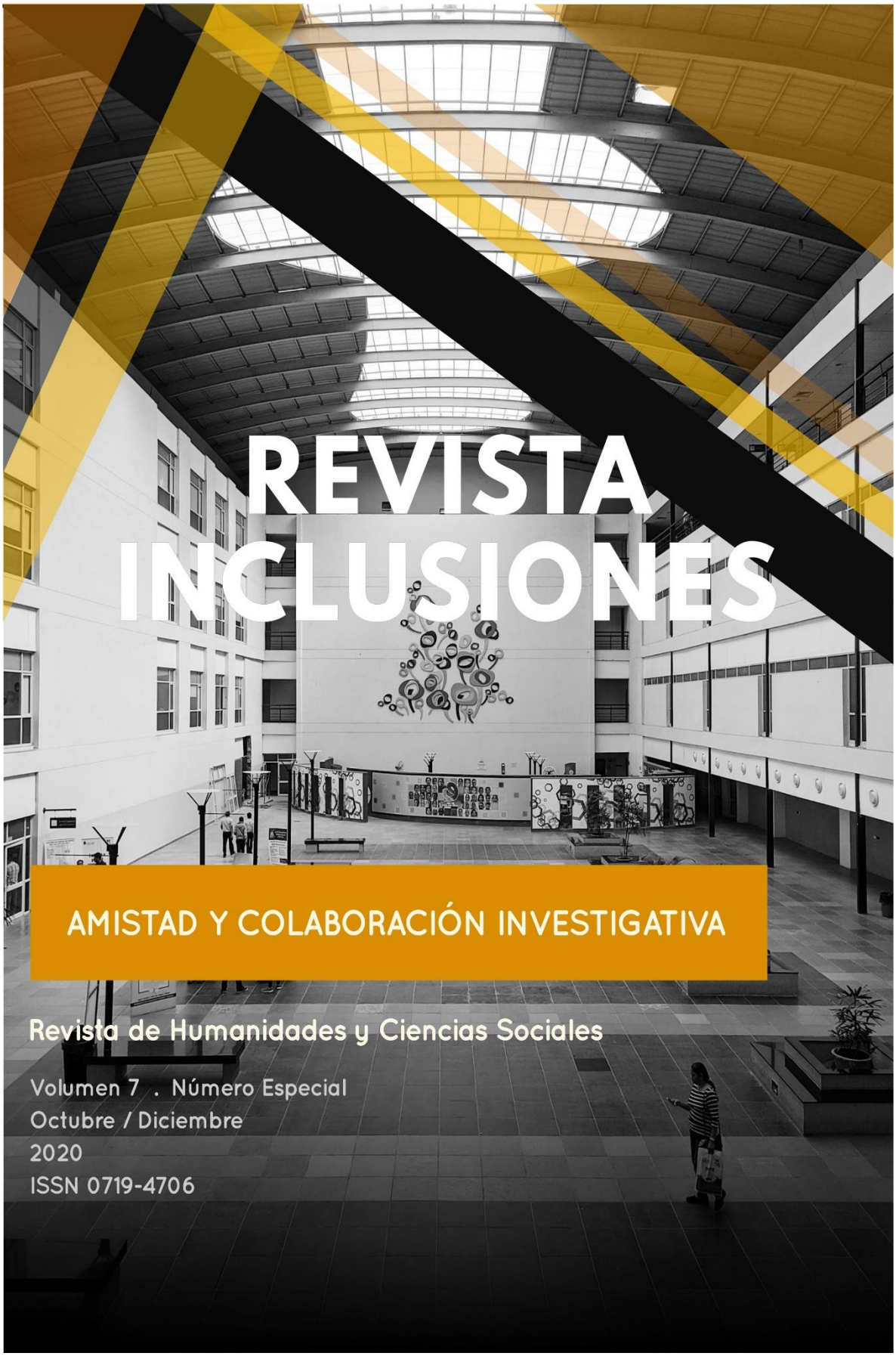

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DEVELOPMENT OF FISHERY COMPLEX INFRASTRUCTURE IN RUSSIA

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Abstract

The main objective of this paper is to specify and develop the scientific foundations of the operation of infrastructure in the Russian fishery complex by means of analysis of the external and internal factors influencing the production, distribution and consumption of fish and seafood. The state of production and consumption of fish and seafood in Russia is determined subject to the development of infrastructure. Current trends of the world fish and seafood markets are analysed. A brief assessment is given to state support measures in the Russian fishery complex. Infrastructure and other factors influencing the development of the Russian fishery complex are identified. Main

directions are formulated for state policies in advancing the development of the Russian fishery complex by way of enhancement of major infrastructure components.

Keywords

Fishery complex – Infrastructure – Fishing – Aquaculture – Development programmes

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Paptsov, Andrey G.; Avarskii, Nabi D.; Kolonchin, Kirill Viktorovich; Taran, Vasiliy V.; Polukhin, Andrey A. y Popova, Carolina Y. Development of fishery complex infrastructure in Russia. Revista Inclusiones Vol: 7 num Especial (2020): 503-516.

Highlights

A brief analysis of the Russian fishery complex is conducted with regard to infrastructure development with the following results:

Russia's current standing in the global fish and seafood market is determined.

The trends of aquatic biological resource production are shown by the major fishery basins of Russia.

The main organisational and economic reasons behind inadequate fish and seafood consumption levels in the country are outlined.

Strategic policy papers are listed that set the vectors of fishery complex development at the moment and for the future.

Proposals and recommendations on fishery complex development in Russia are formulated based on the enhancement of infrastructure elements.

Introduction

The fishery complex is a composite cross-industry formation engaged in the production, processing, storage and distribution of a wide range of fish and fish products of both natural and hatchery origin used for food and non-food consumption. The products of the fishery complex may appear in different descriptions but the popular terms such as "fish and seafood" or "fish and fish products" are usually appropriate references for economic studies. These categories usually include a range of aquaproducts other than fish, primarily of the animal origin (shrimps, clams, etc.). Fish and seafood are sourced from the World Ocean and its seas, as well as inland surface waters (rivers, lakes). Moreover, year on year, momentum is growing in the commercial hatchery (aquaculture or fish farming) developed both in sea aquatories and artificially built inland ponds. In the same way as in the agroindustrial complex in agriculture, processes in the system of the fishery complex occur both within and between diverse functional areas including the production, processing and distribution of fish and seafood. That said, in the current circumstances, the efficient and stable operation of the fishery complex in any country is contingent on the state of infrastructure facilitating fish and seafood production and distribution all the way to end consumption in households and public catering.

Literature Review

The issues of infrastructure development in the fishery complex have been addressed in many research and methodological papers. Theoretical papers offer multiple different interpretations of the concept and essence of fishery complex infrastructure as an economic category. In our view, this multiplicity of definitions may reflect the fact that fishery infrastructure is characterised by national and sectoral specifics and, depending on this, can represent and operate at different stages of development. Fishery infrastructure in our study is addressed as a component of infrastructure in agricultural products, commodities and food complex with corresponding common principles of development and operation. Similar to other product complexes, fishery infrastructure represents an organisationally, technologically and economically interrelated system of various industries working toward a common end result to accommodate consumer demand and earn profit

for expanded reproduction. The development of fishery infrastructure is a result of the social division of labour, deeper specialisation and consolidation of production of fish and fish products.

Modern scholarly and economic sources provide extensive interpretations and multiple definitions of the main functions and objectives served by fishery infrastructure. However, the notion of fishery infrastructure is so broad and multifaceted that it can hardly be reduced to a compact and precise definition.

The most comprehensive definition of fishery infrastructure, in our view, is proposed by the researchers of the All-Russia Research and Development Institute of Agricultural Economics and the VNIRO Russian Federal Research Institute of Fisheries and Oceanography[1]. They define it as a system of productive and economic relations between economic agents in accordance with the stages of circulation of fish and fish products. The respective stages are: production, catch, storage, transportation, processing, trade and consumption, and along the way, fish and fish products undergo transformations and change hands several times. In our view, methodologically, comparisons of multiple definitions should focus on what they all have in common. We believe fishery infrastructure represents an organisational and economic system driven by the factors of the external and internal environment and combining organisations engaged in the production, catch, preparation, transportation, processing, storage, marketing and consumption of ready fish and fish products.

The issues of fishery complex development have been a focus of national research and educational institutions specialising in performance management in the fish industry, particularly, the All-Russia Research and Development Institute of Agricultural Economics and the VNIRO Russian Federal Research Institute of Fisheries and Oceanography. Of special note is the VNIRO Russian Federal Research Institute of Fisheries and Oceanography, which counts, apart from the central institute, 28 branches accommodating all of Russia's fish basins and five dedicated higher education institutions with nine branches, primarily institutions of secondary professional education.

[1] K. V. Kolonchin; S. N. Seregin y Kh. N. Gasanova, “Osnovnye printsipy i metody gosudarstvennogo regulirovaniya rybokhozyaistvennoi deyatelnosti v kontekste mezhdunarodnykh soglashenii Rossii”, Ekonomika, trud, upravlenie v selskom khozyaistve Vol: 4 num 49 (2019): 59-74; K. V. Kolonchin; Kh. N. Gasanova y S. N. Seregin, “Realizatsiya gosudarstvennoi programmy RF "Razvitie rybokhozyaistvennogo kompleksa": tendentsii i perspektivy”, Ekonomika, trud, upravlenie v selskom khozyaistve Vol: 6 num 51 (2019): 54-73; K. V. Kolonchin; S. N. Seregin y Kh. N. Gasanova, “Stimulirovanie rossiiskogo eksporta rybnoi produktsii”, Ekonomika, trud, upravlenie v selskom khozyaistve Vol: 12 num 45 (2018): 117-129; N. D. Avarskii; Kh. N. Gasanova y V. V. Taran, Teoreticheskie i prakticheskie aspekty tovarodvizheniya na agroprodovolstvennom rynke (zarubezhnaya i otechestvennaya praktika) (Moscow: All-Russia Research and Development Institute of Agricultural Economics, 2014); T. O. Mukhamedova y I. E. Iushkova, “Gosudarstvennoe regulirovanie rybnogo khozyaistva”, Ekonomika selskogo khozyaistva Rossii num 3 (2016): 29-36; T. O. Mukhamedova, Formirovanie i razvitie regionalnogo optovogo rynka rybnoi produktsii (na materialakh Astrakhanskoi oblasti): author's abstract of the thesis in candidacy (Moscow: Russian National Research Institute of Process Engineering, Labour and Management in Agriculture of the Russian Academy of Agricultural Sciences, 2013); A. Paptsov; N. Avarskii; K. Kolonchin; A. Bogachev; S. Seregin y K. Gasanova, “Insurance as a Component of The Marketing Mechanism to Develop Aquaculture”, Amazonia Investiga Vol: 9 num 26 (2020): 498 – 510 y N. D. Avarskii y V. V. Taran, “Razvitie infrastruktury rybokhozyaistvennogo kompleksa stran Evropeiskogo Soyuza”, Ekonomika, trud, upravlenie v selskom khozyaistve Vol: 4 num 61 (2020): 18-31.

The main directions of fishery infrastructure development in Russia are addressed in papers by N. D. Avarskii[2] O. V. Antonova[3], O. Iu. Vorozhbit[4], N. V. Zykova[5], I. V. Ivanova[6], N. M. Kotov[7], S. I. Kurdiukov[8], K. V. Kolonchin, S. N. Seregin, Kh. N. Gasanova[9], V. V. Taran[10], T. O. Mukhamedova[11], N. Iu. Nesterenko[12], E. N. Tupikina, V. A. Andreev[13] and many other prominent economists.

Notably, this field, in general, is rarely addressed in economic research, though such studies (in the form of theses, public assignments, monographs, periodical publications) have been conducted at dedicated research institutions and higher education institutions over the years. Generally, Russian research into the problems of development of the fishery complex is largely specialised.

The whole system of fish production and processing and specifically the infrastructure of its distribution is not well-researched in economic terms and calls for dedicated in-depth cross-disciplinary studies, especially given this new urgency amid the new developments, challenges and processes of the 21st century (the digitalisation and robotisation of the economy, technological modernisation, dynamic advance of commodity and food markets with the countertrends of globalisation vs. anti-globalism and regionalisation, power struggles for influence in the ocean, depletion of bioresources, rising demands for eco-friendly and healthy nutrition).

[2] N. D. Avarskii; Kh. N. Gasanova y V. V. Taran, Teoreticheskie i prakticheskie aspekty…; A. Paptsov; N. Avarskii; K. Kolonchin; A. Bogachev; S. Seregin y K. Gasanova, “Insurance as a Component… y N. D. Avarskii y V. V. Taran, “Razvitie infrastruktury rybokhozyaistvennogo kompleksa stran…

[3] O. V. Antonova, Formirovanie mekhanizma ustoichivogo razvitiya ekonomiki promyshlennykh predpriyatii regionalnogo rybokhozyaistvennogo kompleksa (metodicheskii aspekt): author's abstract of the thesis in candidacy (Astrakhan, 2006).

[4] O. Iu. Vorozhbit, “Konkurentosposobnost rybnoi produktsii kak faktor ekonomicheskoi bezopasnosti”, Rossiiskoe predprinimatelstvo Vol: 8 num 9 (2007): 119-123.

[5] N. V. Zykova, “Osnovy ratsionalnogo prirodopolzovaniya rybovodstva”, Rossiiskoe predprinimatelstvo Vol: 14 num 23 (2013): 150-155.

[6] I. V. Ivanova, “Problemy rybokhozyaistvennogo kompleksa Kamchatskogo kraya”, Rossiiskoe predprinimatelstvo Vol: 12 num 9 (2011): 141-144.

[7] N. M. Kotov, Sovershenstvovanie gosudarstvennogo upravleniya razvitiem regionalnykh rybokhozyaistvennykh kompleksov dalnego vostoka: thesis in candidacy (Moscow, 2016).

[8] S. I. Kurdiukov, Formirovanie strategii ustoichivogo razvitiya rybokhozyaistvennogo kompleksa : teoriya i praktika: thesis ... Doctor of Economic Sciences (Moscow, 2007).

[9] K. V. Kolonchin, “Sovremennaya infrastruktura rynka rybnoi produktsii: sozdanie bezbarernoi sredy dlya povysheniya konkurentosposobnosti produktsii”, Ekonomika selskokhozyaistvennykh i pererabatyvayushchikh predpriyatii num 1 (2019): 12-18; K. V. Kolonchin; S. N. Seregin y Kh. N. Gasanova, “Osnovnye printsipy i metody…; K. V. Kolonchin; Kh.N. Gasanova, S.N. Seregin, “Realizatsiya gosudarstvennoi programmy… y K. V. Kolonchin; S. N. Seregin y Kh. N. Gasanova, “Stimulirovanie rossiiskogo eksporta rybnoi produktsii”…

[10] N. D. Avarskii y V. V. Taran, “Razvitie infrastruktury rybokhozyaistvennogo kompleksa stran…

[11] T. O. Mukhamedova y I. E. Iushkova, “Gosudarstvennoe regulirovanie rybnogo khozyaistva”… y T. O. Mukhamedova, Formirovanie i razvitie regionalnogo optovogo rynka…

[12] N. Iu. Nesterenko, “Sovremennoe sostoyanie logisticheskogo upravleniya materialnymi potokami v rybnoi otrasli Kamchatskogo kraya”, Rossiiskoe predprinimatelstvo Vol: 13 num 9 (2012): 152-156.

[13] E. N. Tupikina y V. A. Andreev, “Gosudarstvenno-chastnoe partnerstvo i rybopromyslovyi flot”, Rossiiskoe predprinimatelstvo Vol: 11 num 9 (2010): 80-84.

Proposed Methodology

General description

The study was conducted with the financial support of the Russian Foundation for Basic Research as part of the research project No. 19-314-90003 and under the assignment of the Russian Ministry of Education and Science, "To formulate the scientific foundations of infrastructure development in the fishery complex of Russia". The research subject is the Russian fishery complex and fish and seafood production and distribution infrastructure. The sources of economic and technical research information include international statistics from the FAO, Russian statistics (Russian Federal State Statistics Service (Rosstat))[14], the Strategy for Development of Fishery Complex until 2030 developed by the Russian Ministry of Agriculture and data of the National Report on the Progress and Implementation in 2018 of the State Programme for Development of Agriculture and Regulation of Agricultural Product, Commodity and Food Markets.

Algorithm

The economic and statistical data processing was based on the common methods of economic analysis. Monograph and expert appraisal methods, analysis and synthesis were used to substantiate the directions of performance management. Economically feasible proposals were made concerning infrastructure development in the Russian fishery complex.

Result Analysis

Fish and fish product consumption levels constitute an important indicator of living standards. The needs for these products are served by the fishery complex constituting a composite cross-industry productive and economic organism[15]. As mentioned above, the fishery complex includes any industry or activity concerned with taking, culturing, processing, preserving, storing, transporting, marketing or selling fish or fish products. It is defined by the FAO as the fishing industry including recreational, subsistence and commercial fishing and the harvesting, processing, and marketing sectors[16]. The commercial activity is aimed at the delivery of fish and other seafood products for human consumption or as input factors in other industrial processes. The fishery complex is a crucial sector of the economy in many countries; directly or indirectly, the livelihood of over 500 million people in developing countries depends on fisheries and aquaculture. Inefficient operation of the fishery complex is one of the principal and complicated, yet under-researched problems of Russian economic development in the market environment. The sector has proved incapable of maintaining sustainable exploitation, deep processing and advanced use of the available aquatic bioresources (hydrobionts), of saturating the domestic market with varied, quality and affordable fish products and ensuring efficient exports[17].

[14] Russian Federal State Statistics Service (Rosstat). Retrieved from: https://www.gks.ru
[15] S.I. Kurdiukov, Formirovanie strategii ustoichivogo…
[16] Food and Agriculture Organization of the United Nations. FAO Term Portal. Fisheries. 2020. Retrieved from: http://www.fao.org/faoterm/collection/fisheries/en/
[17] N. V. Teplyakova, Organizatsionno-ekonomicheskii mekhanizm razvitiya rybokhozyaistvennogo kompleksa (na primere Kamchatskoi oblasti): author's abstract of the thesis in candidacy (Moscow, 2004)

In the current circumstances, the efficient and stable operation of the fishery complex in any country is contingent on the state of infrastructure facilitating fish and seafood production and distribution all the way to end consumption.

Even though infrastructure problems are not uniform for marine and river fishing and aquaculture, fishery infrastructure is often the main limiting factor in the development of the sub-industry. The reason is, significant distances often exist between fish and seafood production sites and places of consumption. It is specifically true for Russia.

Fishing in coastal seas is of utmost social significance, given that over a half of the global population live within 60 km from the coastal line, and the underprivileged often depend on fishing as their only activity. A fisher's contribution includes not only jobs for 7-12 people in the fishery infrastructure sector (fish netting, fish processing, ship repair, shipbuilding, machine building, etc.) and tax revenues, but, in many countries, food security[18].

By catches of fish and seafood, Russia is among the most advanced countries with developed fishery complexes. However, it is only true for fishing, in which segment Russia is in the top ten by the volume of catch. According to FAO estimates for 2017, the catch of fish and seafood was 92.5 million tons live weight equivalent[19]; the figure had grown by 0.6% per year on average since 2010. In Russia, the catch of fish and seafood in 2017 equalled 4.9 million tons (Table 1) with a much stronger annual average growth of 2.6%. Over the period from 2010 to 2017, Russia stepped up in the global ranking of countries by the catch of fish and seafood from the seventh place to the sixth place[20,21].

Over the past decade, aquaculture has sharply gained ground in global fish production, which was driven primarily by China and other Asian countries. The annual average growth of output in this segment globally equalled 4.2% in 2010-2017, which considerably exceeds the same figure for traditional fishing. Despite certain progress in this field, Russia has yet a long way to go to catch up with the leading countries, which poses specific requirements in terms of both quantitative and qualitative infrastructure support (for fry breeding and seed production, procurement of stock control tools, water quality, feeds, etc.).

Currently, the steady progress of Russia's fishery complex continues. The fish and seafood catch level in 2018 exceeded the projection of the State Programme of the Russian Federation for Development of Fishery Complex by 12.6%. The production of commercial aquaculture equalled 238.6 thousand tons, up by 8.6% from 2017. Fish and seafood exports in 2018 rose by 4.5% compared to 2017 in physical terms and by 17.3% in the dollar equivalent, reaching 5.2 billion USD. However, one of the top priorities set by the "May" decrees of President of Russia concerned an increase of exports of the fishery products to 8.5 billion USD per year, which, in turn, makes it necessary to develop the infrastructure component in the industry.

[18] G. D. Titova, Ekonomicheskoe obespechenie ustoichivogo razvitiya promyshlennogo rybolovstva na osnove rentnykh podkhodov: thesis... Doctor of Economic Sciences (Murmansk: Murmansk State Technical University, 2008)

[19] The live weight equivalent refers to fish and seafood weight immediately upon catch (on board).

[20] Biannual Report on Global Food Markets. FAO Food Outlook. 2019. Retrieved from: http://www.fao.org/giews/reports/food-outlook/en/

[21] Global Market Analysis. FAO Food Outlook. 2012. Retrieved from: http://www.fao.org/giews/reports/food-outlook/en/

That said, fish product imports should stabilise: according to FAO estimates, in 2019, the figure is projected at 2 billion USD, in line with the level of 2017[22].

Indicators	Volume	Share of the world market, %	Rank in the world market	Top five countries[1]
Fishing, catch level, million tons	4.9	5.3	6	China (16.3), Indonesia (6.7), EU (5.6), India (5.4), USA (5.0)
Aquaculture, production, million tons	0.2	0.2	19-21	China (47.1), India (6.2), Indonesia (6.2), Vietnam (3.8), EU (1.4)
Fish and seafood exports, billion USD	4.5	2.9	11	EU (35.5)[2], China (23.1), Norway (11.3), Vietnam (8.5), India (7.2)
Fish and seafood imports, billion USD	2.0	1.4	9	EU (55.8)[2], USA (21.6), China (15.9), Japan (15.0), Republic of Korea (5.1)

Note: The figures in brackets show values in million tons or billion USD respectively[2]. Trade between EU member states is included.

Table 1[23]

Russia in the world fish and fish product market

An important segment of the fishery complex is freshwater fishery and aquaculture. Currently in Russia freshwater fisheries and aquaculture exploit 22.5 million ha of lakes and 145 million ha of ponds. Of the total production of aquaculture, as of late 2019, 33.3% was supplied by the Northwestern Federal District (FD), 31.0% by the Southern FD, 16.7% by the Far Eastern FD. The major constituents of the commercial fish farming production are carp (20%), silver carp (16%), salmon fishes (except the Far East) (15%), river trout and lake trout (13%), pond trout (7%).

One of the crucial factors of steady development of the fishery complex is the distance of extraction sites of fish and seafood from the places of catch (production). It is especially important for Russia, where the considerable length of the coastline is set off by the vast territory. According to calculations of the World Resources Institute (WRI), Russia is at the third place by the length of coastline (110 thousand km) following Canada (266 thousand km) and the USA (133 thousand km).

However, by the coast/area ratio, Russia (approximately 7 m/km^2) is significantly lagging behind Canada (29 m/km^2) and the USA (15 m/km^2), let alone the UK (82 m/km^2) and Japan (80 m/km^2). If the inappropriate state of fish and seafood storage and processing infrastructure is taken into account, this circumstance is the main driver of production and consumption imbalance for this type of products.

The imbalance of production of aquatic biological resources by Russian exploiting entities by the country's fishery basins is shown in Table 2.

[22] Biannual Report on Global Food Markets…

[23] Biannual Report on Global Food Markets…

Catch levels of aquatic biological resources	2018	2019	2019 as % vs. 2018
Catch levels of aquatic biological resources, total	4,562.43	4,470.30	98
including: Far Eastern Basin	3,173.14	3,166.24	100
Northern Basin	553.12	464.94	84
Western Basin	66.41	67.88	102
Azov-Black Sea Basin	58.57	57.76	99
Volga-Caspian Basin	49.41	53.10	107
Convention zones, exclusive economic zones of foreign countries and open sections of the World Ocean	624.99	622.46	100

Table 2[24]

Catch levels of aquatic biological resources by fishery basins, thousand tons

Table 2 shows that the Far Eastern fishery basin dominates in the structure of primary production of aquatic biological resources, accounting for 71% in 2019. According to the Russian Ministry of Agriculture, the total harvesting (catch) of aquatic bioresources in the Far Eastern fishery basin equalled 1,623.99 thousand tons for pollock fishing, which is 66.16 thousand tons more than in the previous year; 140.48 thousand tons for cod fishing, up by 30.09 thousand tons from the previous year; 280.50 thousand tons for herring fishing, up by 39.84 thousand tons from the previous year. The total harvesting (catch) of Pacific salmons equalled 498.14 thousand tons, which is 178.66 thousand tons, or 26.40%, less than in the previous year, and 145.57 thousand tons, or 41.29% more than in 2017. In the Northern fishery basin, cod fishing yielded a catch of 301.66 thousand tons, which is 24.80 thousand tons less than in the previous year; the capture of haddock came at 68.49 thousand tons, down by 14.95 thousand tons from the previous year. In the Western fishery basin, sprat fishing yielded catches of 36.35 thousand tons, up 1.59 thousand tons from the previous year; the catch of Baltic herring equalled 20.91 thousand tons, up by 0.26 thousand tons from the previous year. In the Azov-Black sea fishery basin, anchovy fishing yielded a catch of 19.72 thousand tons, down by 5.25 thousand tons from the previous year; sprat fishing yielded catches of 17.94 thousand tons, up by 4.20 thousand tons from the previous year. In the Volga-Caspian fishery basin, the total production (catch) of aquatic bioresources increased more than in any other discussed zones, reaching 21.46 thousand tons in 2019. However, the relative weight of this basin in the total production of bioresources is the smallest (merely 1.2% in 2019); moreover, the increase was largely associated with freshwater fish.

The development of fishery complexes based in natural inland waters, specifically in basins such as the Volga-Caspian fishery basin, should take into account the ever-growing anthropogenic impact on the water environment caused by the advance of transportation, hydrocarbon development, waste pollution from the chemical industry, etc. For fisheries, such anthropogenic impact on the habitat of aquatic bioresources is particularly damaging, as it results in the contraction of fishing reserves and degrading of the components of the supporting water ecosystems[25].

Fish and seafood consumption is an important aspect of national food security. The current situation in the fishery sector is mixed. On the one hand, in the complicated emerging market environment with tough competition in the domestic and external

[24] Russian Ministry of Agriculture. Retrieved from: https://mcx.gov.ru/

[25] O. V. Antonova, Formirovanie mekhanizma ustoichivogo razvitiya ekonomiki…

markets, fisheries have been among the first industries of the economy to have stabilised their production. On the other hand, for a majority of enterprises and organisations, their economic condition has remained difficult[26]. Formally, there are several reasons behind the inadequate fish and seafood consumption levels in the country. These particularly include the increasingly export-oriented industry profile (in 2014, exports constituted 50% of Russia's fish and seafood production, in 2017, the figure came in at 54%), high domestic prices for fish and seafood, insufficient consumption levels of seafood (in 2017, the share in the structure of fish and seafood consumption in Russia equalled 9%, compared to 45% in the USA, 40% in China, 25% in the UK and 29% in France)[27]. However, the main reason for this situation is the unsatisfactory state of the infrastructure, which, by the way, contributes to high seafood prices and low consumption levels.

The development of the Russian fishery complex is guided by the principal regulatory documents defining the general strategic development of Russia in the long run (Federal Law "On Strategic Planning in the Russian Federation", Science and Technology Development Strategy of the Russian Federation, Long-Term Socioeconomic Development Forecast for the Russian Federation Until 2030), the long-term development of national agriculture and agricultural food market (State Programme for Development of Agriculture and Regulation of Agricultural Product, Commodity and Food Markets (extended to 2025), Forecast of Scientific and Technological Development of the Agroindustrial Complex Until 2030, Federal Research and Development Program for Agriculture in 2017-2025, Federal Law "On Organic Products and Amendments to Certain Legislative Acts of the Russian Federation" No. 280-FZ dated 03.08.2018), as well as by basic regulatory documents regulating exclusively or particularly the development of the Russian fishery complex: Federal Law "On Aquaculture (Fish Farming) and Amendments to Certain Legislative Acts of the Russian Federation" No. 148-FZ dated 02. 07.2013, Federal Law "On Fisheries and Conservation of Aquatic Biological Resources" No. 166-FZ dated 20.12.2004, Federal Law "On Exclusive Economic Zone of the Russian Federation" No. 191-FZ dated 17.12.1998, Federal Law "On Continental Shelf of the Russian Federation" No. 187-FZ dated 30.11.1995, national and international statistical sources (Rosstat, FAO, OECD, Eurostat, USDA, etc.) and studies of fishery complex development conducted by Russian and foreign researchers[28].

The implementation of the Ministry of Agriculture's Strategy for Development of Fishery Complex till 2030 (Strategy 2030) would raise the level of harvesting of aquatic bioresources to 5.4 million tons. The objective of Strategy 2030 is to boost the industry total in the country's GDP. It accommodates comprehensive measures for attracting investment into harvesting, fish processing, aquaculture and logistics infrastructure. The main priorities include the expansion of harvesting of aquatic bioresources and setting up new fishing operations in areas of the World Ocean governed by international conventions on fishing, the development of mariculture, construction of new research watercraft, development and deployment of standards of fishery education and establishment of the single digital educational platform Open Fishery Education[29].

[26] V. I. Gribov, Ustoichivoe razvitie okeanicheskogo rybolovstva v usloviyakh formirovaniya rynochnoi ekonomiki: Na primere Novorossiiskrybproma: thesis in candidacy (Moscow, 2000).
[27] New Food Balances. Food and Agriculture Organization of the United Nations. 2019. Retrieved from: http://www.fao.org/faostat/en/#data/FBS
[28] K. V. Kolonchin; S. N. Seregin y Kh. N. Gasanova, “Osnovnye printsipy i metody…
[29] K.V. Kolonchin; S. N. Seregin y Kh. N. Gasanova, “Stimulirovanie rossiiskogo eksporta rybnoi produktsii”…

These and other measures of Strategy 2030 would bring a 2.5x increase in the production of commercial aquaculture to raise it to 618 thousand tons. The share of high-value-added products in total fish production would rise to 65% vs. 30% in 2018. Long-term financial investment on a cumulative basis will reach 613 billion RUB, which is nearly four times higher compared to 2018; meanwhile, the industry turnover in 2030 is projected to rise by 160% to get close to 900 billion RUB. Another important objective of Strategy 2030 concerns the modernisation of the fishing fleet; new watercraft built in Russia would provide at least 80% of harvesting (the figure stood at only 15% in 2018). To speed up the construction of new watercraft and enterprises, a new non-financial support programme is already implemented, namely, the investment quota programme targeting high-value-added production operations. After three stages of distributing investment quotas, 43 new vessels and 26 fish processing plants will be built over the next five years, and the total amount of additional investment is projected at 188 billion RUB. The Russian Ministry of Agriculture also resolved to provide state support in the form of special term lending to finance the reconstruction and modernisation of fishery infrastructure and facilities for processing and storage of aquaculture. Studies were also conducted to introduce, as part of the mechanism, investment projects concerned with processing, storing and marketing aquatic bioresources, including the purchases of refrigerators and freezing equipment[30].

Conclusion

To summarise the above, it is worth noting that an analysis of the condition of the fishery complex of Russia would warrant a comprehensive approach with feasibility studies of all principal contributing areas, including production, processing, logistics (transportation, storage, packing), wholesale trade (including exports and imports), retail trade in fish and seafood, industries supplying the production factors for the fishery complex, as well as research into the aspects of fish and seafood consumption in households and public catering.

The fishery complex across the range is served by a complex of infrastructure components. Accordingly, the state of infrastructure is often the principal limiting factor in the development of fishing and fish farming in Russia where it concerns ensuring food security and export potential.

Fishing complex infrastructure should be analysed in a systemic approach integrating not only the traditional analysis of its material components facilitating primary production, processing, logistics (storage, packing, transportation), but also the range of non-productive components such as information and communication support, regulatory, institutional (including quality assurance systems), scientific and educational and financial frameworks facilitating fishery complex operations.

The long-term development of the fishery complex in Russia should be balanced, which implies the need to equally address both freshwater production and marine fish and seafood.

Compared to leading foreign countries, the Russian consumption structure particularly lags by the share of seafood (crustaceans, clams, weeds), which warrants closer attention to more precise evaluations of their resources and raising the production and consumption levels.

[30] K. V. Kolonchin; Kh. N. Gasanova y S. N. Seregin, “Realizatsiya gosudarstvennoi programmy…

In the near term, the priority is to enhance the quality of consumed fish and seafood. It can only be facilitated in a complex and at least three-pronged approach integrating the expansion and modernisation of logistics infrastructure; the use of electronic tools for quality assurance of fish, seafood and products (including fish meal) and environmental control in the basins of operation; development of organic fish and seafood production through organic fishing and organic aquaculture.

Given the nutritional value of fish and seafood and the inadequate fish and seafood consumption compared to medical recommendations, in our view, what is required is the advanced development of internal consumption of this type of products from freshwater and marine sources to improve its physical and economic accessibility.

It is reasonable for the near term to ensure that the share of exports vs. the volume of fish and seafood production in Russia remains within 40-45% at the most. The top priorities with regard to fish and seafood exports include geographic expansion (to engage more countries in the EU, South and South-East Asia and the Middle East), building up export ranges (particularly to include processed products), building up non-food product exports (e. g., fish meal).

Considerable reserves of growth in fish production and consumption lie in the area of cluster development and cooperation (cooperation between producers, between producers and processing operations, public-private partnerships, cooperation between Russia and individual countries, between the EAEU and individual countries). This would particularly enable more efficient operation of the existing production and other infrastructure and facilitate faster implementation of investment projects.

Fish and seafood are one of the key elements of food security and national health. Given the specifics of production, which is cardinally different from agriculture, it is feasible to shape a national project labelled along the lines of "Fish and Seafood of Russia" and spanning all directions of productive and infrastructure operations in the fishery complex. Formally, there are projects developed in this area but they are either integrated with agricultural products and primarily oriented at exports (project "International Cooperation and Exports") or focused within a narrow field (e. g., artificial fish farming; Fish-Agro project).

Statistical methodology concerning fish and seafood should be modified for alignment with the statistics of the FAO and the OECD. It is also rational to calculate production levels not only as live weight catch but also as actual live weight handled in ports before further processing, storage, packing and transportation. In terms of fish and seafood consumption, the proper measure may be not live weight but "edible" weight. All that would enable more objective performance assessments of the Russian fishery complex.

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