Artículo de investigación

Insurance as a Component of The Marketing Mechanism to Develop Aquaculture

Страхование Как Компонент Маркетингового Механизма Развития Аквакультуры

Recibido: 5 de noviembre del 2019 Aceptado: 3 de enero del 2020

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Abstract

The study aims at assessing the current aquaculture insurance in the Russian market. Due to this, it is necessary to understand the role of the aquaculture industry in the economy and determine its development in Russia, as well as to assess the modern concepts and processes of the aquaculture insurance. According to the general conclusions of the study, the fish farmers' need in insurance varies depending on the type and size of aquaculture enterprises, the financial structure of their business, and the types of the grown aquatic organisms. In the study it is indicated that the aqua-insurance has not yet become a marketing instrument to minimize economic risks for most fish farmers. This is mainly due to the fact that the aquaculture industry in Russia is still relatively small, and therefore there is a lack of

Аннотация

Целью данного исследования выступает оценка современного состояния страхования аквакультуры на российском рынке. В этой связи необходимо понять место аквакультурной индустрии в экономике и определить уровень ее развития в России, а также оценить существующие концепции и процессы страхования аквакультуры. Общие выводы исследования установили, что потребность в страховании среди рыбоводных хозяйств варьируется в зависимости от типа и размера аквакультурных предприятий, финансовой структуры их бизнеса, видов выращиваемых гидробионтов. В исследовании указывается, что аквастрахование пока не стало маркетинговым инструментом для

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knowledge and experience in the aquaculture insurance. However, the Russia's strategic position, an extensive fund of inland waters and marine areas, and a diverse species composition of farmed and cultivated aquatic biological resources make the aquaculture development rather attractive for business development. Thus, in the study it is concluded that in case of the further development of fish farming, the demand for knowledge and experience in the area of aquaculture insurance will increase.

Key Words: Aqua-insurance, aquaculture, government support, conflict of interest, marketing, risks, fish farming, system stability.

минимизации экономических рисков для большинства рыбоводов. Это происходит главным образом из-за того, что аквакультурная индустрия в России все еще относительно мала, и, следовательно, не хватает знаний и опыта по страхованию аквакультуры. Однако стратегическое положение России, обширный фонд внутренних водоемов и морских акваторий, разнообразный видовой состав выращиваемых и разводимых водных биоресурсов делают развитие аквакультуры достаточно привлекательным направлением развития бизнеса. Таким образом, в исследовании сделан вывод о том, что в случае дальнейшего развития рыбоводства спрос на знания и опыт в области страхования аквакультуры будет расти

Ключевые слова: аквастрахование, аквакультура, государственная поддержка, конфликт интересов, маркетинг, риски, рыбоводство, стабильность системы.

Introduction

Against the background of the observed aggravation of the problem related to ensuring the physical and economic accessibility of food for the population, the development of food producing industries is of particular relevance. As a rule, the provision of the population with food is associated with the development of agriculture and the food industry. However, the world practice indicates that over the recent years the importance of the fishery industry has considerably increased. According to experts of the Food and Agriculture Organization of the United Nations (FAO), more than 87 % of the obtained and produced aquatic organisms are currently used for food, and give about 1/6 of the animal protein and 6.7 % of the total protein consumed. Fish provides 1/5 of the animal protein for more than three billion people (Sostoyaniye mirovogo rybolovstva i akvakultury, 2016), (Sostoyaniye mirovogo rybolovstva i akvakultury 2018). The important role of developing the fishery industry and aquaculture was also stated in the National Security Strategy of the Russian Federation, where along with other activities, they were noted as the most important components of ensuring food security (Ukaz Prezidenta RF No. 683, 2015).

The historical practice indicates the recent stabilization of the volume of fish products capture on a global scale at the level of 91 – 93 mln t (Godovoy otchet PAO "Russkaya akvakultura", 2018). Moreover, due to the gradual exhaustion of aquatic biological resources, there are signs of tension and the decrease in the efficiency of fishing efforts in the world fishery. As a result, it is possible to notice the rapid expansion of the aquaculture industry as an alternative to fish production.

Today, aquaculture is the fastest growing food sector whose global total production has been increasing approximately by 10 % on an annual basis over the recent two decades. Currently, it accounts for more than 40 % of the world's seafood, and has the greatest potential in meeting the growing demand for fish and fish products (Alday, 2010).

Since aquatic organisms are grown in water and, in most cases, are completely dependent on water as a habitat, the aquaculture reserves are subject to a unique set of risks and dangers that are not similar to those in other industries. In addition, the aquaculture through its stocks and growing processes can have impact on the environment and the community around it (Secretan, 2008).

Along with this, the intensification of production processes in fish farming increases. New technologies such as submersible cages, aquaponics, closed-loop and recycling systems, etc. are being developed. On the one hand, this requires considerable investments, and, on the

other hand, it considerably increases the risk of aquaculture production to outbreaks of aquatic organisms' diseases. In particular, R. Pillay notes that the aquaculture is subject to a higher level of risk as compared to other sectors of food production (Pillay,1994).

As a result, fish farmers are challenged to develop and disseminate strategies on reducing risks based on market mechanisms (Paptsov, Medvedeva, 2015). One of the risk management instruments demanded by fish farmers in recent years has been insurance (Beach, Viator, 2008).

Literature Review

The problem under study is at the intersection of various scientific areas covering various aspects of risk insurance.

Theoretical and methodological issues of the fish farming functioning and the aquaculture development are mentioned in the works by V.A. Vlasov (2015), V.I. Kozlova (2004), V.I. Komlatsky (2018), Yu. Mamontova (2010), P.A. Moiseeva (1985), I.S. Mukhacheva (2006), S.I. Nikonorova (2006), S.V. Ponomareva (2016), (2013), Yu.A. Privezentseva (2004), L.P. Ryzhkova (2011), K.V. Tylika (2014), E.I. Khrustaleva (2017), M. Shilina (2009) et al., O. V Kozminykh. (2019).

At the same time, it is necessary to note that little attention is paid to the development of aquaculture insurance. Such studies are unsystematic in nature. The problems related to the aqua-insurance system functioning and measures for its improvement were researched by A. Dementiev (2018), O. Malakhova (2012), D. Medvedeva (2013), L.N. Simacheva (2010), and N.A. Feoktistova (2018).

In foreign countries, the aquaculture insurance development was seriously studied by V. Alday (2010), R. Anrooy (2006), D. Arias (2003), J.R. Arthur (2008), R. Beach and C. Viator (2008), M.G. Bondad-Reantaso (2008), K.H. Coble (2003), Ge Guang-Hua (1997), M. Godfrey (n.d.), T.R. Hanson (2003), M. Howlett (2003), Lou Yong (1997), J.C. Miller (2003), T.V.R. Pillay (1994), J. Rayner (2003), S. Shaik (2003), Secretan, PAD (2008), J.R. Skees (2000), R.P. Subasinghe (2008), Wang Wei-Jing (2004), M. Wenner (2003) et al.

In many respects, the development of aquaculture insurance is restrained by the lack of details on theoretical and methodological issues, and poor substantiation of its top priority areas. Due to this, a comprehensive study of the domestic aqua-insurance system as one of the important instruments for developing fish farming is of great interest.

Methods

The object of the study is the Russian aquaculture industry, as well as the mechanism of its insurance protection. The subject of the study is the system of economic relations among fish-farming enterprise, insurers, and the state associated with organizing the insurance protection of aquaculture.

The study is based on the retrospective analysis of the development of the market for commercial and subsidized aquaculture insurance in Russia. The importance of the study is increasing due to the fact that acting as an instrument to stabilize the income of fish farmers, the aqua-insurance helps to solve the problem of food security, based on the efficient management of production risks, and allows to improve the supply of fish and other aquabiological resources and to stabilize prices for them.

The following research methods were used in the work: monographic, economic and statistical, computational and constructive, expert, system analysis, etc. The empirical base for the study included the data of the FAO, the Ministry of Agriculture of the Russian Federation, the Federal Fisheries Agency of the Russian Federation, and the Federal Government Support Agency for the Agro-Industrial Complex, the Bank of Russia, the National Union of Agricultural Insurers, PJSC *Russian Aquaculture*, *Insurance Today* and *Agroinsurance* portals, as well as the materials published in foreign and Russian scientific literature and periodicals.

During the present study, the role of the aquaculture sector in the Russian economy was defined. The importance of aqua-insurance as one of the efficient risk management instruments in the fish farming industry was revealed. The domestic aquaculture insurance system in Russia was assessed in order to reveal its positive and negative trends. At the next stage, the main sources, causes and risk factors for reducing the stability of the aqua-insurance system were identified. In conclusion, the areas for improving the domestic aquaculture insurance system were outlined.

Results

In recent years, the Russian aquaculture sector has shown positive dynamics in the development expressed in the stable growth of fish and seafood production and considerable results in import substitution (Fig. 1). Thus, for 2017 – 2018 fish farming products had increased by 9 %, and reached 239 thous. t. In the aquaculture, 63 species of fish, crustaceans and mollusks, 27 breeds and crosses, as well as nine domesticated fish species are raised and grown (Daydzhest, 2015). Nowadays in the Russian Federation more than 3.6 thous. fish breeding sites with the total area of 491.6 thous. ha are granted to business entities for use. There are 4.3 thous. enterprises in the aquaculture sector.

However, despite the positive dynamics, Russia is still far behind the global development of the marketable growth of fish and seafood. It accounts for only 0.1 % of the total world production of aquaculture objects. The share of aquaculture in the total supply of fish products in Russia has not exceeded 4.5 % in recent years. At the same time, a considerable part of the domestic production falls at the relatively low-value fish species – cyprinids (about 61 % of the total fish production) and herbivorous fish (Karabut, 2019).

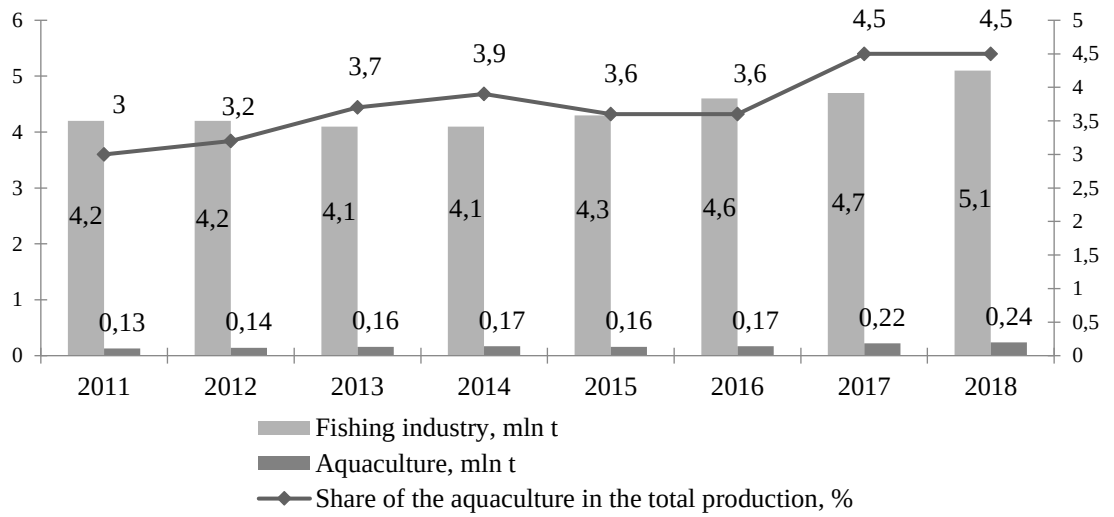

Figure 1. Fish Production in Russia

**Compiled by the author according to the Federal Agency for Fishery and PJSC "Russian Aquaculture"*

The development of the domestic aquaculture industry is constrained by a number of factors that conditionally can be combined into enlarged groups:

1) Production and economic factors: long term of fish growing, deficiency of high-quality domestic fish stock, lack of Russian feed, import dependence on equipment, lack of domestic vaccines to enhance the immune system of fish, depreciation of fixed assets of fishery enterprises, low manufacturability, prevalence of small farms, problems related to the access to financial resources, lack of practical experience, lack of experts in the industry, lack of qualified specialists, technologists, and veterinarians in the area of aqua- and mariculture who have specialized education, increased competition in the global fish market, and problems related to renting land and water,
2) Marketing and organizational factors: insufficient level of focus on the demand and market needs, noncompetitive price, undeveloped logistics, barriers to enter retail chains, poor development of the market infrastructure, higher price of products in export markets, remoteness of fish production centers from consumption centers and the high cost of transporting frozen and chilled fish, and
3) State regulation factors: lack of a systematic state concept for the

development of aquaculture, imperfection of the control and supervision system and customs and tariff regulation of export and import, insufficient volumes and low efficiency of government support, legal unsettling of certain issues in the area of fisheries functioning, administrative barriers and bureaucracy, and a complicated procedure and high cost of governmental environmental impact assessment (Bogachev, 2018a).

One of the characteristic features of fisheries is the high risk of their implementation. This sector is characterized by the same risks that are inherent in other sectors working with biological organisms and processes. However, these risks often go beyond the direct management of fish farmers. Fish farming is also highly risky due to the climatic conditions that are severe in most regions of the Russian Federation: sharp changes in temperature, long winters, and ice cover in the majority of the water reservoirs. All this greatly complicates fish farming, and under the impact of numerous risks, there can be considerable fluctuations in income. This may cause serious production losses. As a result, farmers have to use adequate risk management instruments.

The world practice shows that insurance is one of the most efficient risk management instruments. It is rather difficult to overestimate the relevance of its development in relation to the aquaculture industry, because it allows to:

- Improve the safety of aquaculture enterprises,
- Provide protection against various natural and climatic hazards that can considerably affect the health of aquatic organisms and the volume of capture, the safety of assets and financial stability of fish farmers,
- Compensate for the damage caused to fish farmers as a result of adverse natural and technogenic events,
- Improve the financial stability, including in terms of income, and socio-economic well-being in the community of fish farmers,
- Improve the availability of investments and loans to expand business by reducing the risk of nonreturn of funds,
- Stimulate capital investment in the development of fish farming enterprises and the introduction of new technologies,
- Improve the supply in the fish market, as well as to improve its quality, i.e., contribute to solving the problem on food security,
- Expand opportunities for the mutual assistance and cooperation between farmers,
- Improve the access to additional sources of information on risk management,
- Optimize expenditures from the state budget for paying compensation to aquaculture producers on the risks of emergency situations, and
- Improve the contribution of the aquaculture sector to the development of the national economy.

However, despite all benefits related to the aquaculture insurance, it has not become popular around the world. In particular, a considerable number of insurance policies are found in western industrialized countries, while in other regions, such as Asia, which accounts for about 80 % of the global aquaculture production, this number is much smaller (Aquaculture insurance – Is it worth it?, n.d.). According to Geira Bjarne Mayr, the global manager of the XL Catlin Company, the leader in the aquaculture insurance market, 7 % of the global aquaculture market is currently insured (Mereghetti, 2018). At the same time, in Asia, aquaculture insurance contracts are concluded, as a rule, for individual risks, while in Europe and America multirisk (full) coverage is offered (Malakhova, 2012). Depending on the region and the insurance company, the underwriting procedure and the insurance experience differ considerably.

Nowadays, the aquaculture insurance development is insignificant throughout Russia and in the industry, as a whole. Only a small part of potential risks in Russian aquaculture is insured (Bogachev, 2019). According to the State Program of the Russian Federation “Development of the Fishery Industry”, which has been in force since April 2014, the poorly developed mechanism for risks insurance in the industry is one of the reasons that restrain the commercial aquaculture development (Postanovleniye Pravitelstva RF, No. 314, 2014). Theoretically, any agricultural insurer specializing in agricultural insurance can provide aquaculture insurance coverage. However, Russia is quite vast, and, as a result, natural conditions, the level of economic and industrial development, and other factors can vary considerably in various parts of the country. Therefore, the demand for aqua-insurance and solvency of fish farmers in terms of paying insurance premiums also vary greatly depending

on their location and the level of certain risks. In general, the aqua-insurance functions as a form of economic protection for fish farmers from losses caused by natural hazards and adverse events in the production process.

The analysis of insurance practice suggests that the aquaculture insurance is not a priority industry for the vast majority of insurers. This is largely due to the specifics of insurance in this area, which has its own set of risks, and the limited level of profitability of such insurance. Only a few insurers out of 190 ones in the Russian Federation specialize in aqua-insurance. The main players include RSHB Insurance, Rosgosstrakh, Alfa Insurance, and VSK. As a result, the competition is low in this insurance sector at the national level, and the insurance market is characterized by a high level of concentration.

Another feature of aqua-insurance is the fact that insurers offer products for only a few types of aquaculture and production methods. It is rather difficult to find offers for new species and innovative methods of growing aquatic organisms. This is largely due to the fact that insurers need a wide database and industry standards in order to really assess the risks of aquaculture production and calculate the premiums obtained as a result.

Marketable fish, fish seed (larvae, juveniles, fry), including the breeding stock and/or breeding products (caviar and milt), as well as various crustaceans, mollusks and algae can be insured. It is possible to conclude the insurance agreement both in relation to the farm, and to each specific reservoir. The insurance event is death, loss, forced destruction of fish and other aquatic biological resources as a result of the following risks: diseases (infectious, invasive, noncontagious), external influences (malicious and/or illegal actions of third parties, fire and/or lightning strike, accidents related to the technological equipment and/or power supply systems and/or hydraulic structures), and dangerous natural phenomena (drought, abnormal temperature fluctuations, rainfall, floods, flash flood, mudflows, avalanche, hurricane, storm, suffocation, etc.). At the request of the insurant, it is possible to insure marketable fish and other aquaculture against all risks (multirisk insurance) or selectively (insurance against specified dangers).

Until 2019, the aquaculture insurance in Russia had been represented only by commercial insurance agreements (Bogachev, 2018b). Most often, fish insurance is used if fish supplies act as collateral for obtaining a loan from a bank, i.e., most of the agreements are related to bank insurance. For credit leaders in this sector, insurance companies specifically develop collateral insurance programs for fish supplies. Such policies are closely related to loan agreements. They meet all bank requirements and are designed for the full loan term. In most cases, bank insurance covers only catastrophic risks and is often considered by farmers as an imposed, formal procedure required for obtaining loan proceeds.

However, even catastrophic risks are sometimes realized, and the insured farms obtain serious payments. For example, in 2012 almost RUB 7 million was paid to the fish farm located in the Republic of Karelia due to the death of trout as a result of damage to the fish gills because of the accumulation of loose ice after the storm on Lake Onega. In the same year, fisheries in the Barents Sea obtained the insurance indemnity in the amount of more than RUB 11 mln from RSHB-Insurance due to the loss resulted from the insurance event of Atlantic salmon fry (Mamontov, Sklyarov, Stetsko, 2010). In 2017, the Silver Onegi company that had lost the insured brown trout due to the damage to the cage equipment as a result of the ice drift in the Sundozero water area in Karelia obtained RUB 21 mln [16]. In September 2017, RSHB-Insurance paid RUB 3.8 mln to RM-Aquaculture LLC upon the death of the fish insured against diseases, natural disasters, and other fish risks (AO SK “RSKHB-Strakhovaniye” vyplatilo OOO “RM-Akvakultura” 3,8 mln rubley, n.d.). The largest insurance event took place in February 2019, when as a result of the fire, the insured closed water supply installations, pumps and other equipment of the fish processing complex located in the Krasnoyarsk Territory and owned by Maltat LLC were damaged. JSC IC RSHB-Insurance made insurance payments in the amount of RUB 242.8 mln (AO SK “RSKHB-Strakhovaniye” vyplatilo OOO “Maltat” 242,8 mln rubley, n.d.).

As a rule, large fish farming organizations or farms specializing in the cultivation of expensive aquatic organisms make use of aquaculture insurance beyond credit programs. For such companies, insurance usually includes insurance protection for buildings and equipment, workers, stocks of farmed aquatic organisms, ships, and other insured interests. (Katherine Hawes gives a brief overview of the aquaculture insurance business, 2014). The main insurance interest is the protection of aquatic animals and plants.

It is necessary to note that standardized insurance solutions in aquaculture are an exception. Each aquaculture enterprise is audited on an individual basis. Each company is unique and has its own risk profile. Structures and processes associated with aquaculture operations, their management and relevant market strategies, the type of economy and the method of growing aquatic organisms are individually assessed by insurers in order to calculate the cost of covering risks. This is the only way for the insurance company to make sure that the insurance policy exactly meets the requirements and needs of the aquaculture company and covers the risks taking into account the calculation of the required reasonable amount of the insurance premium.

The analysis of the commercial insurance practice indicates that the level of tariffs ranges from 1.5 % to 6.5 – 10 % (Medvedeva, 2013). This makes multirisk insurance too expensive for small (the average annual production does not exceed 100 tons) and medium (0.1 – 1 thous. tons of products per year) fish farmers, which, according to the Federal Fisheries Agency, account for 86 % and 13 % of 4.3 thous. enterprises currently engaged in aquaculture (Karabut, 2019). There is no sense to insure against certain risks due to the low probability of the insurance event and the need to pay considerable charges.

According to the expert assessment of the Association "All-Russian Industrial Association of Employers in the Field of Aquaculture (Fisheries) "State Cooperative Fisheries Association (Rosrybkhoz)", currently the main insurers are about ten large fish farming organizations producing more than one thousand tons of aquaculture products per year (Poyasnitelnaya zapiska k proektu Federalnogo zakona No. 313594-7, 2017).

The insurance risk in the aquaculture sector is quite high due to the instability of fish farming, its high dependence on the natural and climatic conditions, and features of the aquatic organisms' development and functioning. As a result, insurance rates under aquaculture risks insurance agreements are characterized by high values, which makes such insurance quite burdensome for fish farmers, and reduces its availability. The way out of this situation is the government support system for agricultural insurance that is actively used in many countries. Subsidies for the marketable aquaculture insurance costs are common in the United States, Canada, Austria, Spain, Portugal, Greece, and many other advanced economies. State subsidization of such expenses is one of the ways to support commodity producers that is widespread in WTO countries. The development of agricultural insurance of aquaculture objects supported by the government aims at reducing the financial burden for the state in terms of reimbursing the costs for liquidating emergency cases, the possibility of efficient pursuance of the state policy in the development of the fishery industry, the creation of economic foundations for the efficient realization of insurance relations, the development of the motivation system for organizations and entrepreneurs carrying out commercial aquaculture, to the conclusion of insurance agreements, prevention of abuse by both insurers and insurants (Poyasnitelnaya zapiska k proektu Federalnogo zakona No. 313594-7, 2017).

In Russia, for a long time it had been possible to speak more about intentions and plans related to the government support for insurance of the aquaculture industry risks than about certain and large-scale actions of state authorities (Anosova, Kabir, 2014).

Considerable changes took place in April 2018 due to the adoption of Federal Law No. 109 that extended the legal framework for providing government support in the agricultural insurance while providing insurance protection of the property interests of agricultural producers related to agricultural production to the individuals involved in breeding and (or) keeping, and cultivating aquatic organisms in an artificially created habitat. As a result, on January 1, 2019, the Russian regions obtained the right to subsidies for reimbursing part of the costs of fish farms under insurance agreements for various types of farmed fish (sturgeon, salmon, whitefish, piskerels, eels, etc.), for the breeding of invertebrates (mollusks, crustaceans, echinoderms) and macrophytes (White Laminaria, Japanese Laminaria and Japanese Saccharin).

The government support is provided when insuring the risks of loss (death) of commercial aquaculture objects as a result of the following events: contagious diseases of commercial aquaculture objects included in the list, mass poisoning, impact of natural phenomena (storm, hurricane wind, flood, typhoon, tsunami, ice drift, abnormal decrease in water level and/or abnormal (sharp) drops in the temperature of water used for commercial aquaculture objects and/or its parts) that are dangerous for breeding and/or keeping and cultivating commercial aquaculture objects, violation of electricity, heat,

water supply as a result of natural disasters, if the terms and conditions for the maintenance of commercial aquaculture objects provide for the mandatory use of electric, thermal energy, and water supply, as well as fire (Federalnyy zakon No. 109, 2018). The government support will be provided if the producer insures one or more aquaculture objects for at least one year. At the same time, the insurance amount in the agreement should be at least 80 % (70 % since March 2019) of the insurance value of aquatic organisms.

The procedure for providing government support stipulates that an aquaculture company chooses the insurer that is a member of the National Union of Agricultural Insurers, studies the insurance terms and conditions it offers, and concludes agricultural insurance agreements for at least one year, and then pays half of the insurance premium. As soon as the insurance agreement comes into force, the fish farm forms a set of documents and submits an application to the governing body of the agro-industrial complex of the Russian Federation for subsidies. Based on the results of considering the application and documents submitted by the insurant, in case they comply with the requirements of the legislation, the governing body of the agro-industrial complex of the constituent entity of the Russian Federation makes a decision on providing government support and transfers the remaining 50 % of the insurance premium under the insurance agreement at the expense of regional and federal budgets to the insurer's account. At the end of the reporting period, the governing bodies of the agro-industrial complex of the constituent entities of the Russian Federation submit reports to the Ministry of Agriculture of Russia. Based on it, the performance indicators of government support, as well as the need of regional budgets in funds of the federal budget for the next period are assessed (O razvitii i podderzhke akvakultury (rybovodstva) v Rossiyskoy Federatsii, 2018).

As part of creating the regulatory framework, the Ministry of Agriculture of Russia developed qualification requirements for the certification of independent experts in aquaculture insurance, a list of contagious diseases of commercial aquaculture objects, and a draft methodology for determining the insured value and the amount of loss (death) of commercial aquaculture objects.

However, the methodology offered by the Russian Ministry of Agriculture for determining the insured value and the size of the death of aquaculture objects caused a lot of complaints from fish farmers and the expert community. This determines the need to amend this document. In addition, the developed list of infectious diseases of marketable aquaculture objects covered by the subsidized agricultural insurance includes 15 fish diseases and ignores diseases of other types of aquatic biological resources. Along with this, only two regions – Karelia and the Murmansk Region – are included in the published Draft Agricultural Insurance Plan for 2019. At the same time, only salmon fish insurance will be subsidized this year. When applying the maximum deductible of 30 % of the amount insured, the subsidy rate is 1.32 %, and 6 % in case there is no deductible (Prikaz Minselkhoza Rossii, No. 92, 2019).

According to the published Draft Agricultural Insurance Plan for 2020, the territory where it is possible to obtain subsidies for the aquaculture insurance was extended from two regions to all regions of the Russian Federation. In addition to salmon, the list of fish species subject to insurance includes sturgeon and catfish. Moreover, the limit rates for calculating the subsidies for the aqua-insurance, depending on the constituent entity of the Russian Federation and the level of the unconditional deductible for salmon fish species, are set within 3.4 – 6.2 %, for sturgeons – 2.8 – 5.6 %, and for catfish – 1.5 – 2.1 % (Proekt Prikaza Minselkhoza Rossii "Ob utverzhdenii Plana selskokhozyaystvennogo strakhovaniya na 2020 god", 2019). This makes the insurance expensive enough for small farms. In general, it is planned to allot RUB 85.8 mln from the federal budget for government support for the aquaculture insurance in 2020.

The Russian system of subsidized agricultural insurance provides for the participation of three parties in the implementation of the insurance operation – the insurant (fish breeding enterprises, private entrepreneurs, individuals), the insurer (insurance and reinsurance companies), and the state (the Bank of Russia, the Ministry of Agriculture, the Ministry of Finance, the Federal Agency for State Support of Agribusiness, Rosrybolovstvo and other state and regional authorities). Moreover, for objective reasons their interests do not coincide, and sometimes contradict each other. As a result of such conflict of interests among participants in the insurance market, there is a risk of the decrease in the stability of the aqua-insurance system (Tsakaev, Saidov, 2018).

The main sources of this systemic risk are participants of the insurance process. Two main causes of systemic risk as a source of risk

reducing the stability of the aqua-insurance system are associated with fish farms that act as insurants: the financial situation of fish farmers and the decrease in their demand for insurance. The factors that have impact on the financial situation of fish farmers include poor financial stability of fish farmers, low liquidity of their assets, debt and high interest rates on loans, high tax burden, the high cost of feed, veterinary products, fish stock, and equipment, the lack of investments and low investment attractiveness of the industry. The factors that have impact on the decrease in demand for insurance include the high cost of the aquaculture insurance, imputation of most insurance agreements, insurance protection mainly against catastrophic risks, the lack of a developed line of insurance products, stiff terms for concluding insurance agreements and the need to collect and provide a considerable package of documents when determining the cost of insurance and calculating the insurance compensation, ignoring of the type of economy (pond, lake or sea), as well as the level of development of production technologies and statistics of losses in recent years, the hope to obtain the government support in the form of subsidies in emergency situations, distrust of insurers, low insurance culture of fish farmers, the lack of aqua-insurance supported by the government (until 2019), nonviability of the methodology for determining the insured value and the amount of death of aquaculture objects under insurance with the government support, and including only fish diseases in the list of infectious diseases.

The following three reasons are associated with the insurer as a source of systemic risk: low supply from insurers, weak competition in the aquaculture insurance market, and undeveloped reinsurance market. The factors of insurers' reduced supply include the undeveloped line of insurance products, the lack of clear legal regulation, problems in the development of the aquaculture industry and the high risk of aquaculture insurance, uncertainty about the financial stability of fish farmers, difficulties in controlling the state of aquaculture objects in the coastal zone of natural reservoirs, the lack of officially approved aquaculture growing methodologies, the lack of subsidized aquaculture insurance until 2019, the lack of guarantees in a timely transfer of government support, and the lack of a unified database of long-term statistics on the death of fish and other aquaculture objects. It is possible to specify the following factors of weak competition in the aquaculture insurance market: low industry priority for insurers, unfair competition in the aqua-insurance, and the lack of experience and specialists. The factors that have impact on the reinsurance market may include: the limited volumes of reinsurance, the high cost of reinsurance, the lack of specialized reinsurance companies, and the lack of a unified methodological base for insurance and reinsurance.

The causes of systemic risk due to the fault of the state include its insufficient attention to the aqua-insurance and the low level of interaction with other participants in the insurance market. The factors that cause the state's insufficient attention to the aqua-insurance include legal nonregulation of certain issues in the aquaculture, conflicts in the legislation, the lack of efficient mechanisms to protect the interests and rights of insurants and insurers, the lack of additional requirements for the reliability of insurers in this insurance sector, the lack of a clear regulatory framework and common rules for resolving damage in the aquaculture insurance, the lack of an exhaustive list of required documents, the "raw" methodology for determining the insured value and the amount of death of aquaculture objects, undefined state authority and the method for issuing acts of cases of loss and death of aquaculture products, the need to allot additional budgetary allocations for the insurance of aquaculture objects with the government support, and the imputation of aquaculture insurance agreements. The factors related to the low level of interaction with other participants in the insurance market are nontransparency of information on the interaction of the state with insurers and insurants, the low quality of advisory services on the aquaculture insurance at the local level, the unsustainable mechanism for collecting data and information, the weak state interest in cooperation with insurance market entities, administrative barriers, and a high degree of bureaucracy.

Thus, under the current economic conditions the aquaculture insurance has not yet become a financial instrument to minimize economic risks for the vast majority of Russian fish farmers. This increases the relevance of solving the problem on improving the existing aqua-insurance system towards improving its attractiveness for insurants and insurers, and improving its efficiency in general.

Conclusion

Risk management is an important issue that has impact on the further growth and success of the aquaculture industry. Aquaculture producers

face a number of production risks that have considerable impact on the quantity and quality of their products. This makes them take adequate insurance measures. The aqua-insurance is in demand among large fish farms that consider it as a financial component of the mechanism for developing their business. At the same time, the extent of aquaculture insurance coverage remains insufficient. As a result, there is a need to develop a strategy for developing and further improving the aqua-insurance system.

Such measures may include the following:

- Expanding the range of insurance products offered to farmers, including specialized ones for small and medium-sized aquaculture enterprises,
- Adapting insurance to the specifics of certain regions, taking into account their climatic and economic characteristics (development of special regional aqua-insurance programs),
- When offering insurance policies, taking into account the needs of types of farms, the species of the farmed aquaculture, and the level of applied agricultural technologies,
- Simplifying the insurance procedure and reduction in the number of documents provided during the registration of insurance events,
- Expanding the state subsidies for aqua-insurance and the increase in funding,
- Increasing the presence of insurance organizations in regions and in remote territories in order to promote and popularize aquaculture insurance, improving the availability of insurance services,
- Improving the methodology for determining the insurance value and the amount of death of aquaculture objects,
- Expanding the list of infectious diseases of commercial aquaculture objects that fall under subsidized aqua-insurance, including diseases of other types of aquatic biological resources in addition to fish,
- Improving the transparency of mechanisms for risk assessment, recognition of insurance events and loss settlement,
- Developing the risk reinsurance system in the Russian Federation,
- Forming the statistical and methodological base for the purposes of aqua-insurance,
- Approval of the aquaculture cultivation methodology,
- Training of qualified specialists, technologists, veterinarians in the area of aqua- and mariculture having specialized education,
- Improving the qualifications and retraining of personnel of insurance companies, as well as managerial personnel,
- Improving the awareness of the merits and importance of aquaculture insurance to improve the sustainability of the sector by combining the efforts of insurance companies, state authorities, aquaculture producers and their associations, and industry unions,
- Developing the legal and political environment at the national level to support aquaculture insurance with the participation of key stakeholders, and
- Conducting thematic seminars and training courses on insurance issues in government institutions and organizations involved in fisheries and fish farming, and involving the officials who are responsible for the development and decision-making in aquaculture, experts, dedicated experts, representatives of aquaculture and scientists in order to popularize knowledge and exchange experience.

The further development of the aquaculture insurance will ensure the financial sustainability of the fishery industry, provide fish farmers with an efficient instrument to minimize and manage production risks, improve the availability of loans for them to expand their business, protect commercial and public investments made in the industry, and also reduce the dependence of the domestic market on fish products import.

References

Alday V. (2010). Aquaculture Insurance: The Need for Evaluation of Disease Risk for the Sustainability of a Company. Trébol, 53, 4 – 13.
Anosova L.A., Kabir L.S. (2014). Finansovoye regulirovanie vosproizvodstvennykh protsessov v rybokhozyaystvennom komplekse Rossii: analiz sovremennoy praktiki [Financial regulation of reproduction processes in the fishery industry of Russia: analysis of modern practice]. Economics and Management, 11(109), 18 – 30.
Anrooy R., Secretan P.A.D., Lou Y., Roberts R. & Upare M. (2006). Review of the current state

of world aquaculture insurance. Rome, FAO. FAO Fisheries Technical Paper, 493, 92.

AO SK "RSKHB-Strakhovaniye" vyplatilo OOO "Maltat" 242,8 mln rubley [JSC RSHB-Insurance IC paid Maltat LLC RUB 242.8 mln]. Retrieved from: http://www.fagps.ru/news/ao-sk-rshb-strahovanie-vyplatilo-ooo-maltat-2428/.

AO SK "RSKHB-Strakhovaniye" vyplatilo OOO "RM-Akvakultura" 3,8 mln rubley [JSC RSHB-Insurance IC paid RM Aquaculture LLC RUB 3.8 mln]. Retrieved from: https://www.mngz.ru/russia-world-sensation/3317524-ao-sk-rshb-strahovanie-vyplatilo-ooo-rm-akvakultura-38-mln-rubley.html.

Aquaculture insurance – Is it worth it? – Coverage of operational risks linked to strict conditions (n.d). Retrieved from: https://www.eurofishmagazine.com/sections/aquaculture/item/479-aquaculture-insurance-is-it-worth-it-coverage-of-operational-risks-linked-to-strict-conditions.

Beach R., Viator C. (2008). The economics of aquaculture insurance: An overview of the U.S. pilot insurance program for cultivated clams. Aquaculture Economics & Management, 12(1), 25 – 38.

Bogachev A.I. (2018a). Obespecheniye prodovolstvennoy bezopasnosti na osnove razvitiya rybnogo khozyaystva [Ensuring food security based on the development of the fisheries industry]. Bulletin NGII, 5(84), 110 – 121.

Bogachev A.I. (2018b). Strakhovanie kak sposob zashchity ekonomicheskikh interesov subyektov akvakultury [Insurance as a way of protecting the economic interests of aquaculture entities]. Agrarian Bulletin of the Upper Volga Region, 2, 118 – 126.

Bogachev A.I. (2019). Sostoyaniye i perspektivy razvitiya strakhovaniya akvakultury v Rossii [State and development prospects of aquaculture insurance in Russia'. Fisheries and fisheries industry, 6(161), 10 – 15.

Bondad-Reantaso M.G, Arthur J.R., Subasinghe R.P. (2008). Understanding and applying risk analysis in aquaculture. FAO. Rome, 306.

Dementiev A. (2018). Strakhovaniyu v akvakulture gotovyat rabochiy mekhanizm s gospodderzhkoy [Insurance in aquaculture is going to get a working mechanism with government support]. Retrieved from: http://www.insur-info.ru/press/136370/.

Federalnyy zakon ot 23 aprelya 2018 g. No. 109-FZ "O vnesenii izmeneniy v Federalnyy zakon "O gosudarstvennoy podderzhke v sfere selskokhozyaystvennogo strakhovaniya i o vnesenii izmeneniy v Federalnyy zakon "O razvitii selskogo khozyaystva" v chasti strakhovaniya obyektov tovarnoy akvakultury s gosudarstvennoy podderzhkoy" (2018). [Federal Law No. 109-FZ dated April 23, 2018 "On Amending the Federal Law "On State Support in the Area of Agricultural Insurance" and on Amending the Federal Law "On Agricultural Development" in terms of insurance of commodity aquaculture objects supported by the state"]. Retrieved from: https://rg.ru/2018/04/25/fz109-dok.html

Feoktistova N.A. (2018). Perspektivy strakhovaniya tovarnoy akvakultury v Rossii [Prospects for commodity aquaculture insurance in Russia]. In the proceedings of the XIX International Scientific and Practical Conference "Insurance in the Digital Economy: Problems and Prospects"; in 2 volumes; Responsible editors: E.V. Zlobin, T.V. Sarycheva. 414 – 419.

Ge Guang-Hua & Lou Yong. (1997). The fisheries insurance in China: status and its prospect. Chinese Fisheries Economy Research. Joint publication of the Ministry of Agriculture, China Fisheries Research Institute and China Fisheries General Corporation, Beijing, China.

Godfrey M. (n.d.) China to announce aquaculture insurance framework. Retrieved from: https://www.seafoodsource.com/news/aquaculture/china-to-announce-aquaculture-insurance-framework.

Godovoy otchet PAO "Russkaya akvakultura" za 2018 [The annual report of PJSC Russian Aquaculture for 2018], (2018), Moscow: Russian Aquaculture, 170.

Howlett M. & Rayner J. (2003). Studying Canadian aquaculture policy: issues, gaps, and directions. Annual General Meeting of the Canadian Pacific Science Association, Dalhousie University, Halifax, Canada.

Karabut T. (2019). Osobennosti natsionalnoy akvakultury [Features of the national aquaculture]. Agroinvestor, 4.

Katherine Hawes gives a brief overview of the aquaculture insurance business (2014). Retrieved from: https://www.worldfishing.net/news101/financeinsurance/an-introduction-to-aquaculture-insurance.

Khrustalev E.I., Kurapova T.M., Goncharenok O.E., Molchanova K.A. (2017). Sovremennye problemy i perspektivy razvitiya akvakultury [Current problems and prospects for the development of aquaculture]. Moscow: Lan, 416

Komlatsky V.I., Komlatsky G.V., Velichko V.A. Rybovodstvo (2018). Fish farming. Mosocw: Lan, 200.

Kozlov V.I., Nikiforov-Nikishin A.L., Borodin A.L. (2004). Akvakultura [Aquaculture]. Moscow: Moscow State University of technology and Management, 433.

Kozminykh O. V. 2019. Outsourcing optimization model in the Russian car insurance market. Entrepreneurship and Sustainability Issues, 7(2), 1404-1412. http://doi.org/10.9770/jesi.2019.7.2(42)

Malakhova O. (2012). Akvakultura: riski i zashchita [Aquaculture: risks and protection]. Agricultural Insurance and Lending, 9(88), 18 – 21.

Mamontov Yu., Sklyarov V., Stetsko N. (2010). Prudovoe rybovodstvo. Sovremennoye sostoyaniye i perspektivy razvitiya rybovodstva v Rossiyskoy Federatsii [Pond fish farming. Current state and prospects for the development of fish farming in the Russian Federation]. Moscow: Federal State Budget Institution Rosinformagroteh, 216.

Medvedeva D. (2013). Strakhovanie ryby s gospodderzhkoy v Rossii. Mif ili realnost? [Fish insurance supported by the government in Russia. Myth or reality?]. Retrieved from: http://agroinsurance.com/en/25073/

Mereghetti M. (2018). Salmon super-farms, RAS challenge aquaculture insurance providers. Retrieved from: https://www.undercurrentnews.com/2018/09/12/salmon-super-farms-ras-challenge-aquaculture-insurance-providers/.

Moiseev P.A., Karpevich A.F., Romanicheva O.D. (1985). Morskaya akvakultura [Marine aquaculture], Ed. professors P.A. Moiseeva. Moscow: Agropromizdat, 253.

Mukhachev I.S. (2006). Ozernoe rybovodstvo [Lake fish farming]. Tyumen: Publishing House of the Tyumen State Agricultural Academy, 303.

Nikonorov S.I. (2006). Akvakultura. Formirovanie sovremennoy normativnoy pravovoy bazy v Rossiyskoy Federatsii Aquaculture [Formation of a modern normative legal base in the Russian Federation]. Moscow: Economics and Informatics, 216.

O razvitii i podderzhke akvakultury (rybovodstva) v Rossiyskoy Federatsii: inform. izd. [On the development and support of aquaculture (fish farming) in the Russian Federation: informational issue (2018). Moscow: FSBSI Rosinformagroteh, 136.

Paptsov A.G., Medvedeva N.A. (2015). Rol i znacheniye strakhovaniya v upravlenii selskokhozyaystvennymi riskami v Ispanii [The role and importance of insurance in managing agricultural risks in Spain]. Economics of Agricultural and Processing Enterprises, 8, 63 – 68.

Pillay T.V.R. (1994). Aquaculture development: progress and prospects. Fishing News Books, Oxford, UK.

Ponomarev S.V., Bakaneva Yu.M., Fedorovy Yu.V. (2016). Akvakultura [Aquaculture]. Moscow: Morknig Publishing House, 440.

Ponomarev S.V., Grosesku Yu.N., Bakhareva A.A. (2013). Industrialnoe rybovodstvo [Industrial fish farming]. Moscow: Lan, 448.

Postanovleniye Pravitelstva RF ot 15 aprelya 2014 g. No. 314 "Ob utverzhdenii gosudarstvennoy programmy Rossiyskoy Federatsii "Razvitiye rybokhozyaystvennogo kompleksa" [Decree of the Government of the Russian Federation No. 314 dated April 15, 2014 "On approval of the state program of the Russian Federation "Development of the fishery complex". Retrieved from: https://rg.ru/2014/04/24/rybxoz-site-dok.html

Poyasnitelnaya zapiska k proektu Federalnogo zakona No. 313594-7 "O vnesenii izmeneniy v Federalnyy zakon "O gosudarstvennoy podderzhke v sfere selskokhozyaystvennogo strakhovaniya i vnesenii izmeneniy v Federalnyy zakon "O razvitii selskogo khozyaystva" v chasti strakhovaniya obektov tovarnoy akvakultury s gosudarstvennoy podderzhkoy" [Explanatory note to the draft Federal Law No. 313594-7 "On Amending the Federal Law "On State Support in the Field of Agricultural Insurance and Amending the Federal Law "On Agricultural Development" in terms of insurance of commodity aquaculture objects supported by the state"]. (2017). Retrieved from: http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=PRJ&n=165605#0277133450767 5114

Prikaz Minselkhoza Rossii ot 04.03.2019 No. 92 "Ob utverzhdenii Plana selskokhozyaystvennogo strakhovaniya na 2019 god" [Order of the Ministry of Agriculture of Russia dated 04.03.2019 No. 92 "On approval of the Agricultural Insurance Plan for 2019"]. Retrieved from: https://rg.ru/2019/03/25/minselhoz-prikaz92-site-dok.html

Privezentsev Yu.A., Vlasov V.A. Rybovodstvo (2004). Fish farming, Moscow: MIR Publishing House, p. 456.

Proekt Prikaza Minselkhoza Rossii "Ob utverzhdenii Plana selskokhozyaystvennogo strakhovaniya na 2020 god" [Draft Order of the Ministry of Agriculture of Russia "On approval of the Agricultural Insurance Plan for 2020"]. Retrieved from: https://rg.ru/2020/01/09/minselhoz-prikaz667-site-dok.html

Razvitiye otrasli akvakultury v mire i v Rossii. Daydzhest (2015). [Development of the aquaculture industry in the world and in Russia. Digest]. Belgorod: Information and analytical service of the *Development* Corporation, 50.

Ryzhkov L.P., Kuchko T.Yu., Dzyubuk I.M. (2011). Osnovy rybovodstva [Basics of fish farming]. Moscow: Lan, 528.

Secretan P.A.D. (2008). Aquaculture insurance industry risk analysis processes. In M.G. Bondad-Reantaso, J.R. Arthur and R.P. Subasinghe (eds). Study on understanding and applying risk analysis in aquaculture. FAO Fisheries and Aquaculture Technical Paper. Rome, FAO, 519, 229 – 245.

Seregin S.N., Kayshev V.G., Avarsky N.D. (2018). Osnovy gosudarstvennoy politiki v sfere proizvodstva funktsionalnykh produktov pitaniya: Sovremennyye tekhnologii funktsionalnykh pishchevykh produktov [Fundamentals of state policy in the production of functional food: Modern technologies of functional food], Ed. A.B. Lisitsyna and V.N. Ivanova. Moscow: DeLi Plus, 15 – 33.

Shaik S., Coble K.H., Miller J.C. & Hanson T.R. (2003). Aquaculture Insurance: Issues, Policy Designs, and Potential Research. Department of Agricultural Economics Information Report, Mississippi State University, Starkville, Mississippi.

Shilin M., Golubev D., Alekseev A. et al. (2009). Pribrezhnaya akvakultura [Coastal aquaculture]. Monograph. Saint Petersburg: Publishing House of the Russian State Medical University for St. Petersburg, 287.

Simacheva L.N. (2010). Riski predpriyatiy v sfere promyshlennogo rybolovstva i sovershenstvovaniye ikh strakhovoy zashchity [Risks of enterprises in the area of industrial fisheries and the improvement of their insurance protection]. Vestnik MSTU, 13(1), 158 – 164.

Skees J.R. (2000). Agricultural insurance programs. Workshop on Income Risk Management. Paris, France. OECD.

Sostoyaniye mirovogo rybolovstva i akvakultury 2016. Vklad v obespecheniye vseobshchey prodovolstvennoy bezopasnosti i pitaniya (2016). [State of world fisheries and aquaculture 2016. Contribution to universal food security and nutrition]. Rome: FAO, 204.

Sostoyaniye mirovogo rybolovstva i akvakultury 2018. Dostizheniye tseley i ustoychivogo razvitiya (2018). [State of world fisheries and aquaculture 2018. Achievement of goals and sustainable development]. Rome: FAO, 226.

Tsakaev A.H., Saidov Z.A. (2018). Mekhanizm regulirovaniya riska snizheniya stabilnosti rossiyskoy sistemy selkhozstrakhovaniya [The mechanism of risk regulation of reducing the stability of the Russian agricultural insurance system]. Bulletin of the Chechen State University, 4(32), 9 – 18.

Tylik K.V. (2014). Vodnye bioresursy i akvakultura [Aquatic bioresources and aquaculture]. Moscow: Morknig Publishing House, 137.

Ukaz Prezidenta Rossiyskoy Federatsii ot 31 dekabrya 2015 goda No. 683 “O Strategii natsionalnoy bezopasnosti Rossiyskoy Federatsii” [Decree of the President of the Russian Federation No. 683 dated December 31, 2015 “On the National Security Strategy of the Russian Federation”. Retrieved from: https://rg.ru/2015/12/31/nac-bezopasnost-site-dok.html

Vlasov V.A. (2015). Presnovodnaya akvakultura [Freshwater aquaculture]. Moscow: COURSE, SIC Infra-M, 384.

Wang Wei-Jing. (2004). Analysis on the style of the fisheries insurance development. Shanghai Insurance, Shanghai, China.

Wenner M. & Arias D. (2003). Agricultural insurance in Latin America. Washington DC, USA, Inter-American Development Bank.