

Study on the Relationship between Aquaculture Insurance and Application of Fishery Chemical Elements

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Abstract: In China, the healthy and sustainable development of aquaculture has a great influence on the development of agricultural economy. This paper analyzes the current situation and risks of aquaculture industry in China, and then clarifies the necessity of establishing aquaculture policy insurance, analyzes the mode of aquaculture insurance, and puts forward suggestions on how to expand the implementation of policy aquaculture insurance nationwide from the two aspects of mode selection and specific implementation measures. It is of great significance to deeply understand and enrich the current aquaculture policy insurance and optimize the internal mechanism of agricultural policy insurance.

1. Introduction

China is a big fishery country, and the number of aquatic products accounts for a large proportion in the world, reaching 71.8%. In 2016, China's aquaculture output reached 63.7948 million tons, including 196.313 million tons of mariculture, 31.7926 million tons of freshwater aquaculture, and 918.365 billion yuan of total aquaculture output. Aquaculture has guided fishermen to change their industries, optimized the rural industrial structure, and become a new growth pole of some local rural economies. However, aquaculture is a "three high" industry with high input, high output and high risk. Extreme natural disasters such as typhoons and storm surges, as well as water environment pollution, epidemic situation and other events occur from time to time, which has brought huge losses to aquaculture, and fishermen are often poor due to disasters. Aquaculture was not included in the agricultural policy insurance system until 2016, and its development still lags behind [1]. In disaster prone areas, the extreme mismatch between underwriting risk and profit results in the cautious and conservative underwriting attitude of commercial insurance companies. The compensation given by the state and the governments at all levels is only a drop in the bucket, but only adds an economic burden to the state and the governments at all levels. Therefore, it is necessary to establish policy aquaculture insurance. Perfect aquaculture insurance ensures the healthy and sustainable development of aquaculture and helps the agricultural economy.

2. The Current Situation of Breeding Industry and the Necessity of Establishing Policy Insurance

2.1. Development Status of Aquaculture in China

In the past decade, the output of aquatic products has been increasing, and aquaculture is the main product. In 2016, the total output of aquatic products was 69.0125 million tons, including 51.4239 million tons of aquaculture. But aquaculture is an industry with both benefits and risks[2]. Aquaculture is vulnerable to environmental pollution and pathogens, and to a large extent, depends on the weather, and is highly dependent on the environment. China's aquaculture is mostly distributed in coastal areas, and it is more likely to suffer from natural disasters such as typhoons. Whenever a typhoon lands, it will cause great or small losses to China's aquaculture. According to the statistics of China fishery Yearbook, natural disasters will cause economic losses to fisheries in

various places, especially in Guangdong, Zhejiang and other coastal areas. In 2016, natural disasters made China's disaster area as high as 13670 hectares, with a total amount of 19.2986 billion yuan. Take Zhanjiang as an example. Zhanjiang is located on the edge of the ocean, with the advantages of aquaculture[3]. As a major aquaculture City, Zhanjiang is also a place where typhoon disasters occur frequently. Table 1 shows the statistical data of Typhoon on aquaculture in recent years. After the typhoon, in the process of investigating the farmers who suffered from the "invasion" of natural disasters, it was found that most of the farmers were aware of the protection of fishery production by purchasing fishery insurance. But limited by the insurance company does not have such a product or the threshold is too high, the insurance is limited.

Table 1 Losses caused by strong typhoon in Zhanjiang in recent years

Particular year	Typhoon name	Typhoon grade	Landing site	Direct economic loss	Aquaculture losses
2008	Hagupit	15	Dianbai County, Guangdong Province	14.3	3.1
2014	Rammasun	17	Wenchang, Hainan	151.2	26.9
2015	Seagull	13	Zhanjiang, Guangdong	79.12	13.68
2016	Rainbow	16	Zhanjiang, Guangdong	256.74	19.83

2.2. Necessity of Establishing Aquaculture Policy Insurance

The aquaculture industry suffered from disasters or diseases will bring huge losses to the farmers. Take typhoon as an example. After the typhoon, the aquaculture infrastructure in many areas will be completely destroyed. At the same time, the continuous power failure and heavy rainfall will lead to the difficulty of oxygen supply to the fish pond or the phenomenon of river water flowing back into the fish pond. At the same time, other natural factors such as disease and water pollution are also unavoidable. Aquaculture insurance is a weak hope[4]. Commercial insurance is reluctant to cover mainly because of the uncertainty of customers. The willingness of farmers to buy insurance varies greatly with different regions. The intention of insurance limits the design of insurance company. Moreover, post disaster evaluation is a major problem of commercial insurance. The evaluation of output value is floating, so it is difficult to determine the underwriting standard. In the final analysis, because of the nature of catastrophe insurance policy, non-profit and social security characteristics conflict with the purpose of commercial insurance profitability, it is difficult to launch the commercial insurance of aquaculture.

Due to the high risk of aquaculture, once encountering typhoons and diseases, many farmers have no funds to resume production, and their insurance needs and awareness are becoming stronger and stronger[5]. But at present, there is no aquaculture insurance system in China, only some areas have pilot. Therefore, the state should bring aquaculture insurance into the policy agricultural insurance system as soon as possible, improve and perfect the risk guarantee mechanism, and promote the healthy and sustainable development of aquaculture in China.

3. Choice of Policy Insurance Mode for Aquaculture

3.1. Mode of Aquaculture Insurance Co., Ltd

It is a common way to raise funds in the form of joint-stock system. It is necessary to establish a company specializing in aquaculture insurance to realize aquaculture insurance business. In the practice of foreign countries, such as the United Kingdom, Germany and so on, they adopt the market-oriented mode, which is easy to lead to market failure. Draw lessons from the failure of foreign countries, and position it as a non-profit organization[6]. Most of the financial subsidies will be given by the government, and others such as fishery associations will participate in it. In addition to capital subsidy, preferential policies will be given to aquaculture Insurance Co., Ltd., including reduction of business tax and profit income tax, etc. At the same time, the government also needs to provide a large proportion of premium subsidies for aquaculture insurance farmers, which is in line with China's economic level, accounting for 50% - 60% of the premium ratio.

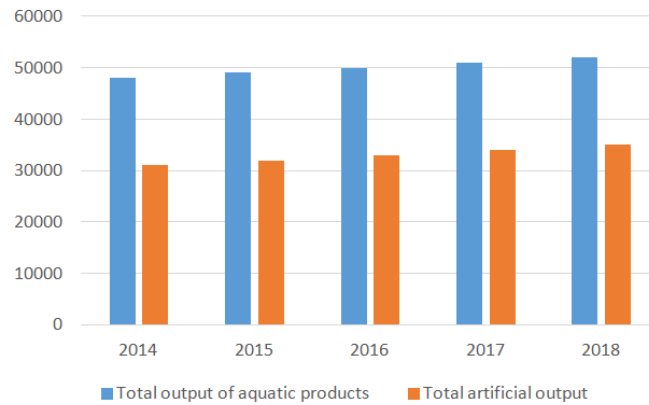


Figure 1 Trend of aquatic product output in China

3.2. Agreement Cooperation Mode between Government and Commercial Insurance Company

This mode is mainly that the local government signs an agreement with the commercial insurance company to hand over the policy aquaculture insurance business to the commercial insurance company for concurrent operation. The aquaculture insurance is operated in the company in accordance with the principle of independent operation, independent accounting, independent subsidy and independent policy preference. The government subsidizes the management expenses of the company and pays for the losses of the aquaculture insurance Paste[7]. In addition, the government provides some funds as catastrophe risk fund. At the same time, communication and cooperation between all parties should be strengthened. Technical personnel should train their employees, guide them to participate in post disaster inspection and loss assessment, and improve their accuracy and impartiality.

3.3. Model of Aquaculture Mutual Insurance Company

Mutual insurance company is a mature and widely used form of insurance organization in the world. It adopts the principle of voluntariness and is composed of local aquaculture enterprises and aquaculture households. It is not only the policyholder but also the shareholder of mutual insurance company, and has the same interests. Participate in mutual insurance to get the lowest risk protection, not the income. The government can subsidize the company's capital and provide technical guidance to realize healthy and efficient operation, with a subsidy rate of more than 50%. It can help the company to formulate the coverage and compensation standards, and adhere to the "guaranteed cost" compensation principle. This mode has low cost and low probability of moral hazard. It is suitable for the area with relatively small cultivation scale.

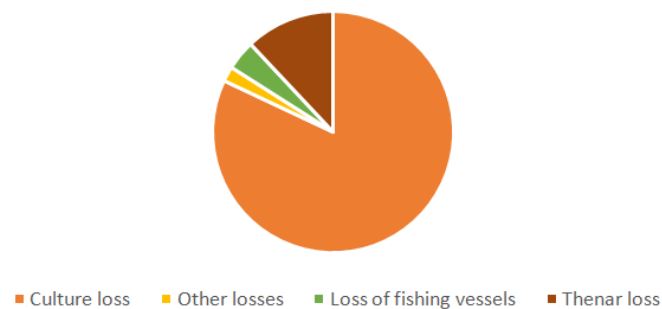


Figure 2 Losses caused by Typhoon "Rainbow"

4. Measures to Implement Policy Aquaculture Insurance

The special nature of aquaculture insurance requires it to follow the policy road. The compensation after the disaster is like a drop in the bucket, far from the goal of ensuring the healthy

development of aquaculture industry[8]. At present, the reasons for the slow development of aquaculture insurance can be summarized as follows: first, the nature of aquaculture insurance subject is special, the survey technology is relatively backward, and the specialty is relatively strong; second, the lack of relevant insurance legislation, the insufficient publicity of aquaculture insurance; third, the limited economic strength of the underwriting subject, and the small premium payment ability. Therefore, in addition to the above modes, effective measures should be taken to solve these factors that hinder the development of policy aquaculture insurance.

4.1. Introduction of Policy Aquaculture Insurance Law and Preferential Policies

The law is the guarantee of aquaculture insurance. At present, there is not a complete law of aquaculture insurance in China, but it is in a situation that can not be relied on[9]. Due to the special nature of aquaculture, the regulations in the insurance law are not applicable. In order to promote the policy aquaculture, it is necessary to formulate the corresponding laws and regulations, no matter which mode is adopted, which can better regulate the behavior of insurance companies and make the insured farmers feel more secure.

4.2. Implement Policy Aquaculture Insurance

We need to achieve multi-party cooperation among the government, insurance companies and aquatic products associations. On the one hand, the government should let the local aquaculture technology promotion station and the aquaculture department work closely with the insurance company to give full play to the professional knowledge of the personnel engaged. On the other hand, strengthen the cooperation between insurance companies and industry associations, strengthen the guidance and prevention before the disaster, and achieve the combination of prevention and protection. It includes professional talents from industry associations and relevant government departments to strengthen the training of employees of insurance companies, enhance professional knowledge and improve work efficiency; expert working groups are jointly composed of three parties to negotiate the premium rate and loss assessment standard.

4.3. Increase Policy Insurance Publicity

China's aquaculture industry is developed, but the scope of aquaculture is relatively scattered, the access threshold is not high, and it is fragmented. Most farmers are engaged in the form of family, and their knowledge level limits their insurance awareness [10]. Therefore, we should make full use of the media publicity role of TV and newspapers and magazines, strengthen the promotion of new media, and gather the scattered farmers through industry associations to carry out the insurance knowledge popularization meeting, so as to improve the popularization rate of relevant knowledge.

4.4. Establish Catastrophe Insurance Mechanism and Reinsurance Mechanism

All kinds of breeding risks include natural risks, environmental risks (sea water and fresh water pollution), technical risks and moral risks. According to the experience of foreign countries, when farmers purchase breeding insurance, they are not sure about the amount of insurance. Evaluate and calculate according to the actual loss. The establishment of reinsurance system in the background of financial support. The financial sector concentrates the advantages of the financial sector, commercial insurance and other parties, exceeding the payment value, and transfers them to the disaster risk fund. Different compensation methods are determined according to the impact of disasters.

5. Existing Problems in Water Treatment of Chemical Elements in Aquaculture

Chemical water treatment agents commonly used in aquaculture are mainly alkaline, salt, halogen and other environmental regulators, which are used to adjust the water quality of aquaculture water and improve the ecological environment of aquaculture. The second disinfectant is used to remove harmful substances in aquaculture water and kill pathogenic microorganisms, such as phenol, alcohol, aldehyde, acid, heavy metal salt, etc. Chlorine disinfection is one of the

commonly used methods. It has good disinfection effect, convenient use and low price. However, in the research and use, during chlorination and disinfection, chlorine reacts with specific organic and inorganic components and water to form a series of halogenated organic by-products, most of which are volatile trichloromethane and non-volatile halogen acid and other harmful substances to do something. In recent years, it has been found that the potential harm of bromotriha methane is much greater than that of chloroform. At the same time, under certain conditions, ammonia nitrogen reacts with chlorine to produce ammonia chloride, which has no bactericidal effect on pathogens in water, and under certain conditions, ammonia is also transformed into toxic nitrite. The elimination and management of the by-products of chlorine disinfectants are gradually concerned. With the development of aquaculture, people often select a new disinfectant.

6. Conclusion

With the rapid development of aquaculture in China, the use of chemicals is also increasing. The toxicity, efficiency, deterioration of water environment, and ecological toxicity of aquatic organisms have a great impact on aquaculture. Therefore, aquaculture insurance is closely related to the chemical elements of aquaculture.

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