WAYS TO IMPROVE THE ECONOMIC EFFICIENCY OF FISH FARMING

I.Yunusov – PhD, "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract: *The article substantiates the objective need for the development of the fish farming industry, summarizes its features into a single system, develops recommendations for improving the system of indicators of the economic efficiency of fish farming, reveals the relationship of factors affecting the development of the industry, reveals significant aspects of foreign experience in the development of the industry. In particular, the ongoing reforms in the fish farming industry and trends in change, the state were analyzed, recommendations were developed on the basis of norms that provide for saving resources, reducing the cost of material, technical and labor resources necessary for growing fish.*

Keywords: *fisheries, aquaculture, efficiency of fisheries enterprises, production of fish products, state support for fisheries.*

Introduction. The dynamic development of the system of production of biological resources is the most important function of the state policy in the field of rational nature management. The transition to market relations in Uzbekistan predetermined the need to create a new economic mechanism for resource use, the development of new approaches to state regulation of the production of fish products.

The fish industry of the Republic of Uzbekistan is the most important component of the food security system of the republic.

Of particular importance is the dynamic development of aquaculture as a sustainable source of providing the population with fish products. In the conditions of increasing anthropogenic impact on the environment, production is the main direction of preserving and increasing the commercial value of freshwater reservoirs.

The current practice of financing work on the production of fish products does not activate the dynamic development of the industry. Modern practice requires the search and development of new scientific approaches to the development of the industry, theoretical and methodological justifications for the specialization of fisheries, the development of practical recommendations for the development of the industry, and the identification of ways to increase the economic efficiency of fish production. The lack of systematic research in this area and the importance of the production of fish products for the dynamic and efficient development of aquaculture determine the relevance of this problem.

The development of fish farming in conditions of food security is an objective necessity, and the economic reforms associated with the development of the industry serve to meet the demand of the population for fish and fish products and improve their health.

In order to further increase the objective necessity and socio-economic significance of the development of the fish farming industry, we consider it expedient to carry out the following measures:

– improving the efficiency of fish farming and fish products;

- improving the material and technical supply of the fish farming and processing system, attracting investments in the industry;

– efficient use of natural and artificial reservoirs;

– widespread introduction of scientifically based resource-saving methods and intensive fish farming technologies;

- broad establishment of the cultivation of marketable fish products, as well as paying attention to the optimal territorial distribution of the fish farming industry;

– systematization of organizational and economic relations in the value chain of fish products;

- stimulating the system of re-reproduction of fish fry and providing fish farms with feed;

– development of mechanisms for state support for the development and improvement of the efficiency of the fishery industry;

– based on the analysis of foreign experience, the development of proposals on the possibilities of introducing its significant aspects.

Materials and methods. The fish farming industry has several specific features, given them, it is possible to determine the direction of the industry development (Figure 1).

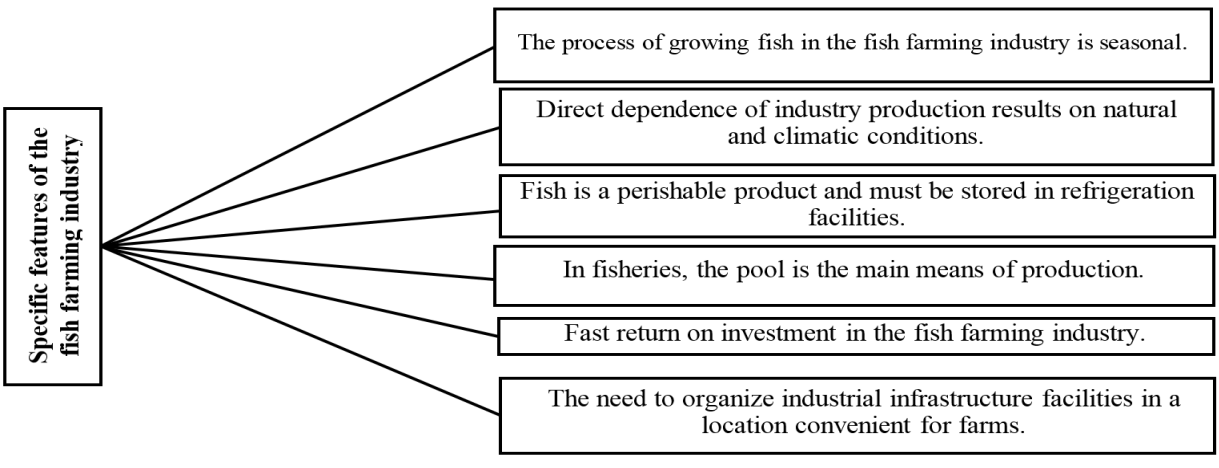


Figure 1. Specific features of the fish farming industry

Features of the fish farming industry are similar to the general properties of agricultural production. By increasing economic efficiency, it is possible to adjust these properties, or rather, to transfer industries from a seasonal cycle to a year-round cycle, which will make it possible to find sources of additional capital and bring them into the production process.

These characteristics require attention when evaluating the efficiency of fish farming, including indicators that determine economic performance and improve the methods of their accounting.

The system of indicators was developed by dividing the economic efficiency of fish farming into three: cost, natural, relative indicators (Figure 2).

Indicators such as the cost of electricity consumption per cage capacity of 1 m3, the cost of equipment needed to grow 1 kg of fish in a cage method, the number of fish grown in a cage capacity of 1 m3 (productivity indicator), labor costs corresponding to a cage capacity of 1 m3, the profitability of growing fish in a cage capacity of 1 m3 makes it possible to determine the economic efficiency.

Several factors influence the development of fish farming. They are studied by dividing into the following 4 groups: organizational and legal factors, economic factors, natural and geographical factors, socio-demographic factors, and having studied the influence of factors on the development of the fish farming industry, an econometric assessment of their relationship is given. We also consider it expedient to introduce the following significant aspects of the analyzed foreign practice into the republic:

- due to the specifics of the fishing industry, the introduction of subsidies to cover a certain part of the cost of production can provide benefits (Russian experience);

– for the purpose of treatment and prevention of fish diseases, wider involvement of foreign specialists, organization of training seminars (the experience of Russia, Germany, Croatia);

- increase in fish farming (the experience of Vietnam, China, Turkey, Russia) through the introduction of intensive technologies (cages, closed water circulation systems);

- economic incentives for the cultivation of granular feed with a high content of nutrients (the experience of Turkey, Germany, Russia);

– organization and development of consulting services in the industry (the experience of Germany, Croatia).

Comprehensive measures are being taken in our country to modernize agriculture and accelerate the development of the fish farming industry. An integrated approach to solving issues related to the development of fisheries, the conservation of biological diversity and the reproduction of fish by intensive methods (cages, a closed water circulation system, small intensive pools) can be considered one of the main tasks of economic reforms carried out in the agricultural sector.

Also, according to the trend of structural and quantitative changes in the industry with the emergence of various forms of ownership as a result of the formation of market relations in the volume of fish farming and in terms of population consumption of fish products, growth has been achieved over the years. Of course, this helps to improve the provision of the ever-increasing needs of the population for food.

Data analysis. According to the analysis, the largest increase in total fish production in 2018 falls on the Navoi region (12%), Andijan (11.2%), Tashkent region (10.9%), the Republic of Karakalpakstan (10.8%), Khorezm (10 ,4%). and Jizzakh (7.9%) regions (Table 1).

In addition, the total volume of fish production in Bukhara region (4.1%), Surkhandarya region (4.2%),

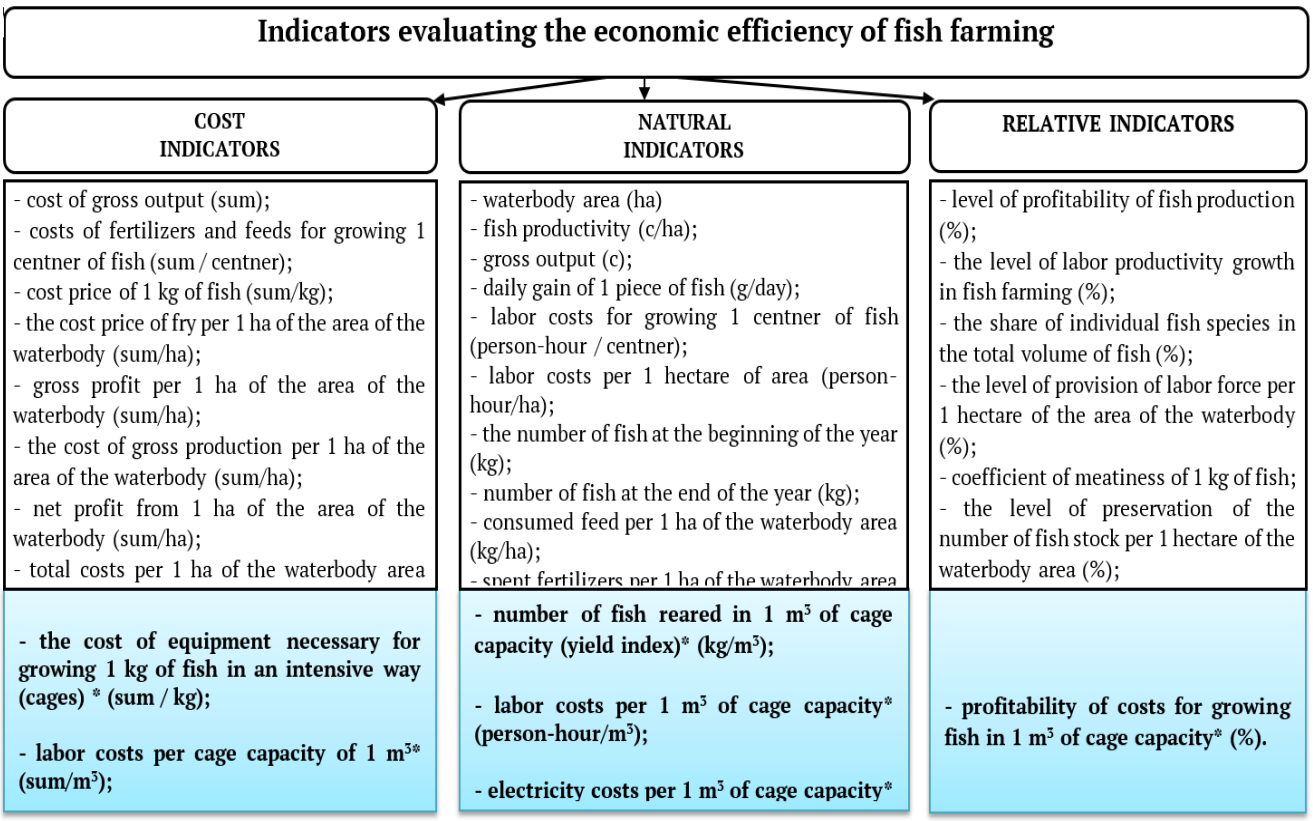


Figure 2. Indicators evaluating the economic efficiency of fish farming

Samarkand region (4.4%) and Kashka-Darya region (5.3%) was relatively low. The indicators of fish production in the country in 2018 increased by 1.96% compared to 2014 and by 108.4% compared to 2017.

In 2014-2018, a sharp increase in fish production was achieved in Andijan region (by 4.7 times), the Republic of Karakalpakstan (by 3.71 times), Syrdarya region (by 3.48 times), Navoi region (by 2.89 times).), Samarkand region (2.89 times), Surkhandarya region (2.51 times), Namangan region (2.5 times) and Bukhara region (2.38 times). In 2018, 35665.8 tons of fish were grown in fish farms, which is 39.2 percent of the fish grown in the country. 9578.7 tons of fish were grown in dekhkan farms, and 45739.8 tons of fish in limited liability companies (LLC).

Before analyzing the activities of fish farms and comparing their technical and economic indicators, it is advisable to study the existing main problems in the industry. According to research based on a survey conducted in the Republic of Karakalpakstan, Surkhandarya and Namangan regions, respectively, 96%, 98% and 90% of respondents had problems with water, 80%, 90% and 78% with maintenance, 94%, 96% and 92% with nutrition problems, 84%, 92% and 94% with a lack of qualified specialists in the field, 56%, 64% and 86% with a low level of veterinary services, 88%, 68% and 92% with a shortage medicines, 86%, 94% and 90% - with problems in the supply of mineral fertilizers. Such problems were identified as the most important ones influencing the development of the industry. To eliminate them, it is necessary to improve the organizational and economic mechanism and further improve the legal framework.

Table 1.

Indicators of growing fish by regions of the republic.

Regions	2014	2015	2016	2017	2018	In 2018 compared to 2014, (+,- or %)
Republic of Karakalpakstan	2658	3 410	4 515	6 157	9856,7	+3,71
Andijan	2176	2 535	2 088	4 081	10224	+4,7
Bukhara	1570,7	1 951	2 813	3 400	3737,9	+2,38
Jizzakh	9035,5	10 850	11 198	13 838	7151,5	79,2
Kashkadarya	2608	3 151	3 952	4 770	4796,1	183,9
Navoi	3771,1	5 610	7 670	12 566	10882,4	+2,89
Namangan	2146	2 733	3 384	5 218	5360	+2,5
Samarkand	1384	1 839	2 540	3 435	4006,1	+2,89
Surkhandarya	1521,8	1 911	2 580	3 876	3815,9	+2,51
Syrdarya	1545	1 822	2 279	2 222	5375,9	+3,48
Tashkent	8000,4	11 557	8 171	8 155	9867,2	123,3
Fergana	3485,1	4 025	5 214	6 782	6430,3	184,5
Khorezm	6490	8 457	8 919	9 401	9480,3	146,1
Total	**46391,6**	**59 852**	**65 322**	**83 900**	**90984,3**	**+1,96**

Today, in fish farms, the use of the technological map plays an important role in saving material and labor resources and cost analysis.

In Namangan and Surkhandarya regions, as well as in the Republic of Karakalpakstan, respectively, 36, 40 and 46% of fisheries managers noted that it is possible to achieve a reduction in fish production costs based on compliance with scientifically based standards of material and labor costs.

According to the results of the studies, if the profitability of fish farming according to the main method per 1 ha in the Hatamabad fish farm of the Mingbulak district of Namangan region was 25.6%, then the profitability of fish farming according to the technological map increased to 37.2% or, by 11.6% compared with the traditional method, and the income increased by 31.6% (Table 2).

In addition, labor costs for growing a unit of product decreased by 7%, feed consumption on average - by 10%, consumption of mineral fertilizers - by 13% and energy consumption - by 24%.

According to the analysis of per capita consumption indicators, on average, for the main food products in the country, fish and fish products averaged 4.8 kg per capita in 2018. This indicator increased by 1.3 times or by 1.2 kg compared to 2014, decreased by 20 percent compared to 2016. The norm of annual consumption of fish is defined as 13.37 kilograms, and today 8.6 kilograms of fish products are consumed less than the norm established for the population.

To date, lending and financing, insurance, training, advanced training and education, the system for the development of selection and the genetic fund are important factors in providing the industry with feed.

Table 2.

Indicators of the economic efficiency of growing fish in a waterbody of 1 ha in the fish farm "Khatamobod" of the Mingbulak district of Namangan region (for silver carp)

№	Expenses	Unit of measurement	Traditional way	Based on the technological map	Difference (+,-)
1.	Payroll expenses	thousand soums	6580	8100	1520
2.	The cost of purchasing fry	kg	250	250	0
	Cost	*thousand soums*	*3500*	*3500*	*0*
3.	Feed costs	thousand soums	4010	4770	760
	Of them:				
	Mineral fertilizers	kg	700	800	100
	cost	*thousand soums*	*770*	*880*	*110*
	Local fertilizers	kg	3000	3000	0
	cost	*thousand soums*	*240*	*240*	*0*
	Limestone	kg	1200	1500	300
	cost	*thousand soums*	*360*	*450*	*90*
	Food and vitamins	kg	3300	4000	700
	cost	*thousand soums*	*2640*	*3200*	*560*
4.	Electricity consumption	thousand soums	60	60	0
	Pumping costs	thousand soums	40	40	0
5.	Depreciation	thousand soums	146	146	0
6.	Transport costs	thousand soums	96	96	0
7.	Veterinary service	thousand soums	150	150	0
8.	Overhead costs	thousand soums	324	405	81
9.	Unexpected expenses	thousand soums	146	175	28,71
10.	General expenses	thousand soums	11252	14152	2900
11.	Period expenses	thousand soums	113	142	58
12.	Marketing and modernization	thousand soums	225	283	58
13.	**General expenses**	thousand soums	**12100**	**14576**	**2476**
14.	Fish productivity	t/ha	1,9	2,5	0,6
15.	The value of the gross product	thousand soums	15200	20000	4800
16.	Profit	thousand soums	3100	5424	2324
17.	**Profitability**	**%**	**25,6**	**37,2**	**11,6**

This is, firstly, partial and full coverage by the interest rate of bank loans, and, secondly, the increase in the level of water salinity as a result of an increase in the surface of groundwater is not included in the current procedure, it is necessary to enter these indicators as insurance and set the maximum amount of insurance money in the amount of 30 percent and an insurance premium of 5 percent, and thirdly, providing the industry with qualified specialists armed with modern knowledge will serve as the basis for further strengthening the food base.

Conclusion and recommendations. The solution of existing problems, taking into account the specifics of fish farming and the production infrastructures serving it, as well as the organization and planning of production based on the study of individual features of the industry.

Such indicators of economic efficiency as the cost of equipment required for rearing 1 kg of fish using the intensive method, the volume of fish grown in a cage capacity of 1 m3, the profitability of production, labor costs per cage capacity of 1 m3, electricity consumption per cage capacity of 1 m3, allow you to optimally locate fish farming, draw up and implement a business plan, as well as correctly analyze the results obtained.

According to the cost analysis for the area of water bodies in 1 hectare in the fish farms "Muhammed Amin Tojihon" in Mingkhulak district of Namangan region, "Azizbobo" in Uzun district of Surkhandarya region, and "Antika" in Turtkul district of the Republic of Karakalpakstan show that a significant share of the cost of fish production fall on fertilizers (14-15%), fish feed (30-32%), purchase of fry (16-17%) and wages (13-15%).

According to the cost analysis of material and labor resources in fish farms, the profitability of growing fish in the traditional way is 25.6 percent, and the profitability of growing fish based on the technological map is 37.2 percent. At the same time, labor costs for growing 1 kg of fish are reduced by 7 percent, feed consumption - by an average of 10 percent, mineral fertilizers - by an average of 13 percent, energy - by an average of 24 percent.

Organizational and economic incentives to strengthen the food base in the fish farms themselves and supply them with feed from external sources, as well as in order to improve the food supply of the farms, the allocation of land area based on the area of the reservoir, the productivity of fish per 1 m3 of the reservoir and the level of groundwater will give good results. Therefore, it is advisable to provide economic incentives for the food supply of fish farms on the part of the state by guaranteeing partial coverage of bank loans and covering their full interest rates, applying insurance for damage caused by water salinity at a 30 percent rate and establishing a 5 percent level of insurance premium, issuing customs and tax benefits for feed processing and pellet manufacturing enterprises, fish farms and organizations.

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