ISSN 2181-9408

Scientific and technical journal

Sustainable Agriculture

№4(20).2023

Designer: Dilmurod Akbarov.

Note: Only the authors of the article are responsible for the content and materials of the article. The editorial board does not respond to the content of the article!

Founder: Tashkent Institute of Irrigation and Agricultural Mechanization Engineers

Our address: 39, Kari-Niyaziy str., Tashkent 100000 Uzbekistan , www. sa.tiiame.uz

The journal "Sustainable Agriculture" is registered in the Press Agency of Uzbekistan on the 12th of February in 2018 (license № 0957).

In 2019, the journal is included in the list of recommended scientific publications by the Higher Attestation Commission of the Republic of Uzbekistan.

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IMPORTANCE OF FISH FARMING IN ARTIFICIAL RESERVOIRS

A.Xashimov - researcher "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers" National Research University

Abstract

This article presents the importance of fish farming in artificial ponds. It highlights the importance of pond fishing in agriculture, directions of fish breeding in reservoirs, the main problems in the development of pond fishing, and specific features of pond fishing. There are also suggestions for creating conditions for fish breeding in the pond.

Key words: *artificial pond, pond fishing, fish breeding in ponds, specific features of pond fishing, conditions for fish breeding.*

Introduction. In our country, fish breeding in reservoirs and artificial breeding of fish stocks have developed widely. Pond fisheries provide the population with cheap protein-rich fish and fish products and the industry with the production of canned fish. Intensive development of pond fisheries will ensure the production of many fish products.

Aquaculture is the breeding of fast-growing fish species in specially constructed or adapted ponds. Grass carp, silver carp, crucian carp, sterlet, crucian carp and other fish species are grown in warm water basins together with carp and other heat-loving fish.

The main purpose of growing fish in artificial ponds is:

• meeting the population's need for high-quality, ecologically clean fish products and other aquatic organisms;

• breeding of fish seeds to fill natural and artificial reservoirs with fish in order to restore the population of various fish species;

• breeding of fish for recreational fishing;

• obtaining fish products sold for food, feed and technical purposes;

• creation of additional jobs, stimulation of the development of related sectors of the economy that provide fishing enterprises with equipment and consumables (feed, fertilizer, fuel-lubricants, network materials, etc.), etc.

Undoubtedly, aquaculture occupies an important place in the agro-industrial complex of our country, as a source of valuable food products and in places of direct consumption. The role of pond fisheries in the country's agro-industrial complex should be considered from different points of view, primarily from economic, social and environmental points of view (Figure 1).

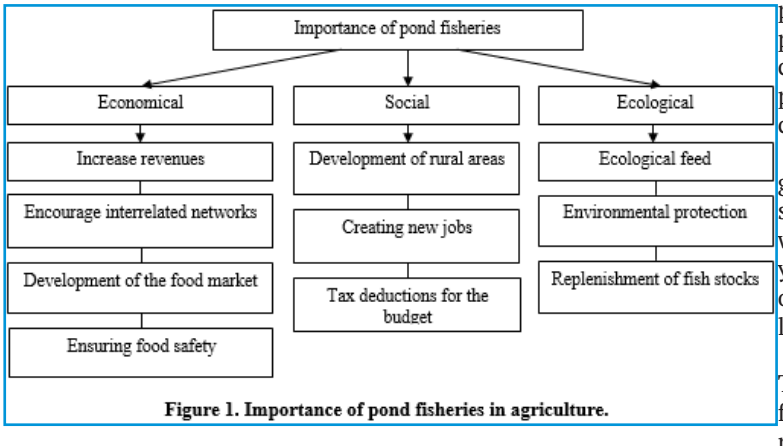

Figure 1. Importance of pond fisheries in agriculture.

The economic importance of pond fisheries increases farm incomes, stimulates interrelated industries, promotes food market development, and ensures food security.

The social importance of pond fishing provides the development of rural areas and the creation of new jobs, providing an increase in tax allocations for the budget.

Its ecological importance is to provide people with environmentally friendly food, protect the environment and replenish fish stocks. It also serves to provide the population with protein-rich products.

As a supplier of raw and semi-finished products for livestock and poultry breeding, food, medicine and light industry, it is also very important that aquaculture has an organic relationship with other sectors of the country's agro-industrial complex.

Worldwide, aquaculture has clear advantages over a number of other industries that produce animal proteins. The efficiency of aquaculture production is primarily due to the fact that fish do not require large amounts of feed compared to other farm animals for growth and development. Fish are cold-blooded animals that consume food only for growth, tissue regeneration and vital activity.

An important advantage of fishing over other sectors of agriculture is the high productivity of fish. If the productivity of large farm animals is calculated in units, and small ones in tens or hundreds of units (birds), the amount of caviar produced annually by different fish species ranges from several thousand (trout) to several tens of thousands (white fish) and hundreds of thousands of pieces (cyprinid) will be. For example, one female carp produces 500-600 thousand eggs. In the following year, at least 60 tons of commercial fish can be obtained [2].

Another important advantage of fish products is that due to the pollution of water bodies, fish in natural conditions often contain toxic substances in their tissues several times higher than the maximum allowed for food products. In the conditions of aquaculture, it is possible to obtain ecologically clean fish products classified as valuable food, dietary and medicinal products with proper selection of farm sites and careful control of feed quality.

The high reproductive capacity of fish, rapid growth, low cost of feed, availability of breeding stock, cultivation of fish in places of consumption will allow to increase its cultivation in the following years. All of the above determine the advantages of pond fish farming compared to other areas of livestock farming.

Fish are mainly grown in two forms in reservoirs. The first and simplest form is large-scale fish farming. It is primarily based on the use of natural productivity of water bodies. In the extensive form of farming, the volume of fish production depends on two indicators: the area of water bodies and their natural productivity. The group of ponds includes fish that can

adapt to growth in artificial water bodies: ponds, cages, ponds, etc. They are represented by the following families: carp, salmon, perch, pike, perch, etc.

The second form of pond fish farming is intensive. It is based on the use of artificial feed, which provides the main increase in fish mass. In this case, natural fertility plays a secondary role.

In contrast to the extensive form, unlike the intensive form of pond fish farming, the total amount of commercial fish produced is determined not only by the area of water bodies, but also by the increase in productivity due to the fertilization of water bodies and the use of artificial feed. In addition, their quantity depends on their quality: the higher the quality of the feed, the lower the feed ratio, and less feed is needed to produce the same amount of commodity fish. Thus, the total volume of intensively farmed commercial fish is determined by two independent indicators that can be controlled: the area of exploited ponds and the amount of artificial feed that can be used within self-defined limits, the ability to clean the pond ecosystem. The intensive form of fish farming in ponds allows for a significant expansion of commercial fish farming with a relatively limited increase in pond area.

At its simplest, intensive and extensive forms of pond fish farming are typical monocultures. Carp has long been an object of monoculture. The disadvantages of such a monoculture are well known: carp cannot consume phyto- and zooplankton, which are produced in large quantities in water bodies. Therefore, the overall efficiency of using the precious pool stock is reduced. A step forward from the intensive form of monoculture is the intensive form of fish polyculture. As the main consumers of this artificial food, carp and silver carp (white and bighead) use phyto- and zooplankton and dust particles of artificial food that saturate the water mass. Currently, fish farming in local water bodies is dominated by polyculture of carp with herbivorous fish such as silver carp and grass carp.

In fisheries, ponds are divided into four groups according to their purpose:

1) water supply (main water, heating water, settling basins);

2) production (spawning, fry, nursery, wintering, feeding and uterus);

3) sanitation and prevention;

4) communal (pools - cages).

Commercial fish production includes the following main technological processes: larval extraction, breeding and wintering of fish seeds, and commercial production. The technology of reproduction and cultivation of carp fish is based on natural fertilization in spawning ponds, where the eggs laid by the female are fertilized with the milk of the male, then the eggs stick to the plants and develop in them. 3-5 days until the larvae emerge at a temperature of 60-80 degrees. After spawning, spawners are captured and placed in summer breeding ponds. Juveniles are kept in spawning ponds for no more than 10 days, often after 3-5 days of active feeding, larvae are caught and transferred to fry or seedling ponds. Natural fertilization has a number of disadvantages, including weather conditions, quality of pond preparation, changes in water level and development of aquatic plants.

Meeting the population's demand for cheap and high-quality fish and fish products directly depends on the development of privately owned fisheries, small businesses and private entrepreneurship. This, in turn, will improve the efficiency of artificial ponds, increase fish stocks in natural water bodies, create a solid feed base, and improve the quality of their service.

improvement in terms of production requires an increase in production and income due to the organization of product processing.

In the development of pond fisheries, there are major problems such as ecological, epizootic, social and resource supply (Figure 2). Environmental issues include the negative impact on ecosystems and water quality of fish feed and faecal waste, and the environmental and ecosystem risks of fish escaping from cages.

Epizootic problems, such as the risk of disease outbreaks and the potential risk of disease transmission and transmission to wild populations, affect the development

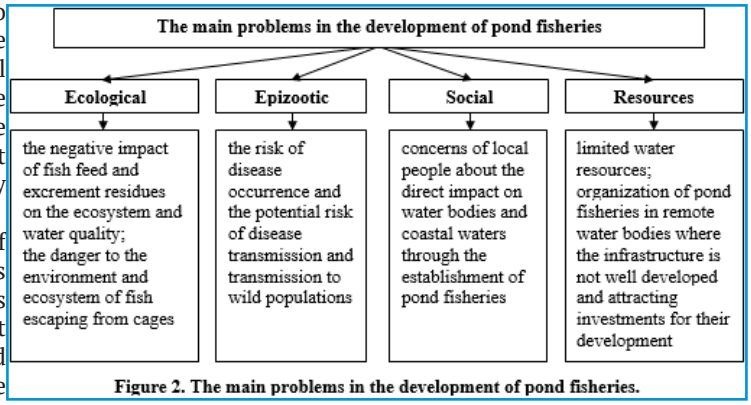

Figure 2. The main problems in the development of pond fisheries.

of fish farming in artificial ponds. Social issues include local residents' concerns about the direct impact on water bodies and coastal waters through the establishment of pond fisheries.

There are also problems in the development of pond fisheries, such as limited water resources, the organization of pond fisheries in remote water bodies with poorly developed infrastructure, and the attraction of investments for their development.

As in other sectors of the agro-industrial complex, general economic laws apply in the fishing industry. But there are specific characteristics of the fishing industry that distinguish it from other industries, and the characteristics of pond fishing are as follows:

- low feed cost;
- rapid growth of fish;
- high reproductive potential of fish;
- the complexity of the process of controlling the development and physiological state of fish;
- the influence of biotic and abiotic factors on the growth of fish;
- short period of sale and storage of fish, etc.

The following conditions must be met for breeding fish in a pond:

1. A source of water supply with good water quality and sufficient capacity throughout the year.

2. Supplying all categories of reservoirs with gravity water.

3. Safe sanitary and epizootic conditions.

4. Compatibility between the climatic zone of the farm and the cultivated species.

5. Availability of convenient access roads and paved roads within the farm.

6. Availability of live fish cages, ponds, and other facilities that allow year-round storage and sale of commercial fish.

7. Having own sales network for live fish or its processed products.

8. Availability of own live fishing gear sufficient to sell farmed products and import fish from other farms.

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