# THE INFLUENCE OF ECOLOGICAL FACTORS ON THE PRODUCTIVITY OF POND BIOCENOSE

**Dilfuza Ahmedova**
**Mohinur Boynazarova**
**Fergana State University**

**Annotation**

In this article, the species composition of the pond biocenosis and the ecological factors affecting their productivity were studied in the fishery farm belonging to "Ziya-Nemat Rivoji" LLC, Kuva District, Fergana Region. The productivity of carp and white carp, which are cultivated in the pond biocenosis, were analyzed in the autumn and spring seasons. According to the results of observation, the maximum period of development of fish fry, i.e. intensive growth, was observed in June, July and August. The development of pond fish is influenced by factors such as types of algae, physical properties of water, chemical composition, temperature, water clarity, amount of oxygen dissolved in water, and nutrition. Improvement of hydrobiological and hydrochemical conditions, enrichment of fish feed resources are important factors in increasing the productivity of pond biocenosis.

**Key words:** biocenosis, intensive method, phytoplankton, biomass, zooplankton, pond water, ecological factor.

**Аннотация**

В данной статье изучен видовой состав биоценоза прудов и экологические факторы, влияющие на их продуктивность в рыбхозе ООО «Зия-Немат Риводжи» Кувинского района Ферганской области. Проанализирована продуктивность карпа и белого толстолобика, выращиваемых в биоценозе пруда, в осенний и весенний сезоны. По результатам наблюдений максимальный период развития молоди рыб, то есть интенсивный рост, наблюдался в июне, июле и августе. На развитие прудовых рыб влияют такие факторы, как виды водорослей, физические свойства воды, химический состав, температура, прозрачность воды, количество растворенного в воде кислорода, питание. Улучшение гидробиологических и гидрохимических условий, обогащение рыбной кормовой базы являются важными факторами повышения продуктивности прудового биоценоза.

**Ключевые слова:** биоценоз, интенсивный метод, фитопланктон, биомасса, зоопланктон, прудовая вода, экологический фактор.

**Annotatsiya**

Mazkur maqolada Farg‘ona viloyati Quva tumani "Ziyo-Nemat rivoji "MCHJ ga qarashli baliqchilik xo‘jaligidagi hovuz biotsenozi turlar tarkibi va ularining mahsuldorligiga ta’sir etuvchi ekologik omillar o‘rganildi. Hovuz biotsenozida yetishtirilayotgan karpsimonlar oilasiga kiruvchi zog‘ora baliq, oq amur baliqlarning kuz va bahor mavsumi bo‘yicha mahsuldorligi tahlil qilindi. Kuzatuv natijalariga ko‘ra, baliq chavoqlarining rivojlanishini maksimal davri ya’ni intensiv o‘sishi iyun, iyul va avgust oylarida kuzatildi. Hovuz baliqlarining rivojlanishiga suvo‘tlarning turlari, suvning fizik xususiyatlari, kimyoviy tarkibi, harorat, suv tiniqligi, suvda erigan kislorod miqdori, ozuqasi kabi omillar ta’sir etadi. Hovuz biotsenozi mahsuldorligini oshirishda gidrobiologik, gidrokimiyoviy sharoitini yaxshilash, baliq ozuqa resurslarini boyitish muhim omillardan sanaladi.

**Kalit so‘zlar:** biotsenoz, intensiv usul, fitoplankton, biomassa, zooplankton, hovuz suvi, ekologik omil.

Fish and fish products are important in meeting the demand for proteins of the population of our republic. Fish has been eaten by mankind since ancient times. According to the recommendation of the Ministry of Health of the Republic, for the healthy development of the human organism, it is necessary to consume 33 g per day or 12 kg of fish products per year. Currently, the fish grown in fisheries and caught from natural reservoirs cannot fully satisfy the needs of the population.

Today, in our Republic, the creation of artificial biocenoses is the step-by-step introduction and promotion of intensive fish farming, the effective use of existing water resources, the widespread introduction of innovative ideas, scientific developments, modern technologies and scientific achievements into the field, and further support of the fishing industry. - attention is being paid to support.

For this reason, the goal was to monitor the ecological factors affecting the productivity of the pond biocenosis in the fishery farm belonging to "Ziyo-Nemat Development" LLC, Kuva District, Fergana Region.

Fertilization, feeding from various natural and artificial factors for the reproduction of fish in ponds, the increase of plant and fish products, and the level of development of bacterio-phyto-zooplankton organisms that produce the primary product in them cause an increase in the number of fish that produce the secondary product.

As a result of light reaching the depths of the fishing pond, underwater meadows are formed. They are adapted to flat and calm areas of the bottom of the pond.

Algae include Bacillariophyta, Chlorophyta, and Cyanophyta divisions in terms of number of species and species. Aquatic areas are turbid and contain a lot of plants, animals and their remains.

In our conditions, the development of fish was 6% in April, 30-35% in July-August, and 10-15% in September-October, depending on the factors of the seasons. According to the results of observation, the maximum period of development of fish fry, i.e. intensive growth, was observed in June, July and August.

Analysis of the fish grown in the pond during the autumn season

Table 1

| Years | Type of fish | Quantity | Age | Weigh of fish (kg) | Biomass (kg) | Fish food |
|---|---|---|---|---|---|---|
| 2022 | Common carp | 500 | 0 | 0,8 | 400 | Submerged aquatic vegetation |
| | Grass carp | 400 | 0 | 0,8 | 320 | |
| | Silver carp | 30 | 0 | 0,7 | 21 | |
| | Average | 310 | | 0,8 | 240 | |
| 2023 | Common carp | 1000 | 1 | 1,500 | 1500 | Submerged aquatic vegetation |
| | Grass carp | 800 | 1 | 1,400 | 1120 | |
| | Silver carp | 50 | 1 | 1,500 | 75 | |
| | Average | 617 | | 1,46 | 898,3 | |
| Average in 2022-2023 | Common carp | 750 | | 1,100 | 950 | Submerged aquatic vegetation |
| | Grass carp | 600 | | 1,100 | 720 | |
| | Silver carp | 40 | | 1,100 | 47,5 | |

When the fish were analyzed by reducing the water in the pond in autumn, in 2022 there were an average of 500 common carp, 400 grass carp, 30 silver carp, and 1 kg of close-up bream. kg, silver carp was 21 kg. The average biomass of fishes observed in 2022 was 240 kg.

In the fall of 2023, an average of 1000 common carp, 800 grass carp, 50 silver carp and about 1500 grass carp were counted. There were 1,500 common carp, 1,120 white carp, and 21 kg of silver carp. In 2023, compared to 2022, 658.3 kg more fish were produced (Table 1).

In winter, Aerator equipment is used to prevent the surface of the pool from freezing and enrich it with O2. This equipment saturates the water with O2 and keeps the water surface in constant motion.

During the analysis in the spring of 2023, an average of 700 common carp, 500 white carp, 30 silver carp and about 2000 fry were detected. In the spring season, the total weight of common carp was 840, grass carp 600, silver carp 30 kg, and the average weight reached 490 kg. The average mass of fish was taken from 1,200 kg and biomass was analyzed. In the 2024 re-analysis, an average of 1,000 common carp, 800 grass carp, 50 silver carp and about 2,500 fry were recorded. The average mass of fish was 1,500 kg, and the average biomass was 898, 333 kg. The average biomass of fish in the spring season of 2023 and 2024 was calculated.According to him, the weight of common carp was 1170 kg, white carp 860 kg, silver carp 52.5 kg.

Analysis of the fish grown in the pond for the spring season

Table 2

| Years | Type of fish | Quantity | Age | Weigh of fish(kg) | Biomass (kg) | Fish food |
|---|---|---|---|---|---|---|
| 2023 | Common carp | 700 | 1 | 1,200 | 840 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Garss carp | 500 | 1 | 1,200 | 600 | Submerged aquatic vegetation |
| | Silver carp | 30 | 1 | 1,000 | 30 | |
| | Average | 410 | | | 490 | |
| 2024 | Common Carp | 1000 | 2 | 1,500 | 1500 | Submerged aquatic vegetation |
| | Grass carp | 800 | 2 | 1,400 | 1120 | |
| | Silver carp | 50 | 2 | 1,500 | 75 | |
| | Average | 617 | | | 898, 3 | |
| Averge in 2023-2024 | Common carp | 850 | | 1,350 | 1170 | Submerged aquatic vegetation |
| | Grass carp | 650 | | 1,300 | 860 | |
| | Silver carp | 40 | | 1,250 | 52,5 | |

According to the obtained results, it should be noted that the productivity of fish in the pond biocenosis is explained by the optimal influence of climatic conditions and environmental factors (Table 2). Also, the growth and development of fish fry primarily depends on water conditions, temperature, oxygen content, presence of phytoplankton, zooplankton and its norm.

In order to increase the productivity of the pond biocenosis, it is necessary to carry out reclamation works correctly. For this, it is important to improve the hydrobiological and hydrochemical conditions and enrich fish feed resources. To improve the quality of water, first of all, the oxygen regime in the water should be improved. When there is dissolved oxygen (6.5-7.5 mg/1) in the water, metabolic processes in fish change positively and productivity increases. As the acidity of pond water (pH 6.8-7.0) increases, it is necessary to quickly neutralize the water and soil environment. For this purpose, quicklime is immediately supplied to the reservoir according to the specified rate. It is advisable to send water to the pools through a water filter as much as possible. Suspended substances in the water settle, the water becomes clear, and the pool water does not become nauseated.

It is known that if a fish pond is kept with water for a long time, the water becomes cloudy, the bottom of the water becomes muddy, its acidity increases, the fish die, and its productivity decreases. As a result of feeding fish for many years, a large amount of organic matter accumulates at its bottom. These sediments decay under the influence of microorganisms. Dissolved oxygen in water is used for the decay of organic matter, as a result, oxygen in the sun decreases. Therefore, the ponds are deeply chiselled, and water is not poured during the summer. Water is poured only before the next year's stocking of fish. After insolation, fish productivity of ponds can increase twice or more. It is advisable to use the insolation method once every 5 years or once every 7 years, depending on the conditions of the pool.

Liming of a fishing pond improves its ecological environment and increases productivity. Lime neutralizes the acidity of water. Before liming, the condition of the pond water and mud is checked. If the pH is 5, liming with quicklime immediately begins. Lime combines with hydrogen ions to neutralize water pH 7.6-8.0. Lime improves the physical properties of water. The main property of lime is that it combines with toxic compounds of magnesium, sodium and potassium and detoxifies them. Another feature of lime is its effect on biogenic substances, which ensures that it is easily digested by organisms. Pond liming produces slaked lime (CaO), slaked lime (Ca(ON)2), and limestone CaCO3

**Conclusion**

Based on natural food (phytoplankton, zooplankton, zoobenthos and macrophyte) in pond conditions, it is possible to grow 1-2 t/ha of fish using the extensive method. By fertilizing the ponds and giving additional feed, it is possible to obtain 3-5 t/ha of fish products in the incomplete intensive method, and 10-15 t/ha of fish products using only balanced high-quality feed with protein content of 37-43% using the intensive method. In conclusion, in order to increase the biomass of the pond biocenosis, it is necessary to carry out amelioration measures in a timely manner.

1. When increasing the biomass of fish in the pond biocenosis, the first step is to naturally breed zooplankton organisms, to increase the viability of fish fry due to the fact that fish fry are fed with primary zooplankton organisms.

2. During the biological treatment of water in June-October of the year, the azolla grown in the waters gives 150-300 g/m2 or 1500-3000 kg of wet biomass per night from 1 hectare of water surface, the azolla contains 20.8% protein, 22 75%, carrageenan 23.3%, fat 0.94% and vitamin V, taking into account that ryaska contains 30-35% protein, 4-5% fat, 20-30% starch, these plants in order to increase the biomass of the biocenosis, it is recommended to grow it in every fishery farm.

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