

Study on Effective Measures of Water Pollution Control in Chaohu Lake Basin

Wentao Hu, Viktor Lemiasheuski

Belarusian State University Belarus 220030

Abstract: Chaohu Lake is not only one of the five major fresh water lakes in China, but also the largest lake in Anhui Province. It is also one of the most polluted fresh water lakes in China. In recent years, its pollution and prevention problems have attracted much attention. Therefore, it is very important to study the current situation of water pollution in Chaohu Lake and discuss the treatment measures to improve the water quality of Chaohu Lake.

Keywords: Chaohu Lake; Pollution and prevention; Water quality

1. Introduction

1.1 Geographical Position

Located in the middle Lake District of Anhui Province, it straddles Hefei and Chaohu, between the Yangtze River and Huaihe River, and belongs to the left bank of the lower Yangtze River system. It is one of the five largest freshwater lakes in China. Chaohu Lake is divided into two lakes: east and west. The bottom of the lake tilts from east to west. The water is turquoise, yellow-brown and poor in transparency. The water area is about 820 km². The basin covers an area of 13,310 km², including Chaohu City, Hefei City, Feixi County, Feidong County, Wuwei County, Lujiang County, Shucheng County, Hexian County and other districts.

1.2 Drainage Characteristics

Chaohu Lake basin has mild and humid climate, belonging to the transitional subtropical monsoon zone climate. The annual average temperature is 15-16 degrees, and the extreme maximum temperature is 39.2 degrees and the extreme minimum temperature is -20.6 degrees. The maximum freezing depth of ten soils over the years is 9-11 cm.

There are more than 30 rivers in the basin with mountain stream characteristics. The main rivers into the lake are: South Feihe River, 15 Li River, Pai River, Zhule River, Hangbu River. Yuxi River is the outlet of Chaohu Lake, the communication rivers. The role of regulating water level. The drainage system of Chaohu Lake basin developed, and the main river channels into the lake, Hangbu River and Fengle River, were affected by the rainy season floods, resulting in severe erosion, and the water and soil erosion caused the silting and blocking of the river, which generally widened the riverbed and finally formed the Shanghe River.

1.3 Topographic and Geomorphic Features

Chaohu Lake basin is located in the hilly region between Jianghuai River and Huaihe River. According to its geomorphological characteristics, Chaohu Lake basin can be divided into five types: low mountainous area, low hilly area, hilly area, hilly area and alluvial plain area. Among them, the first three areas total 2,657 km². Among them, 1,151 km² have no obvious soil erosion, and about 1500 km² have obvious soil erosion, indicating that the terrain slope has a great impact on soil erosion^[1].

2. Pollution Status and Causes

2.1 Population Growth

Taking Longhekou in Shucheng County as an example, the construction of Longhekou occupied more than 50,000 mu of cultivated land, and the resettlement of more than 40,000 immigrants in the reservoir area was not properly settled. The people were forced to cut down trees and open land for grain cultivation in order to solve the food ration problem. However, the forest coverage rate and green degree decreased, and the area of soil erosion accounted for 65.9% of the total basin area. It can be seen that population growth has a profound impact on water pollution in Chaohu Lake basin.

2.2 Agricultural Production and Pollution

Excessive use of fertilizers and pesticides in agricultural production, make a lot of organic matter into the basin, Chaohu Lake water quality affected by nitrogen and phosphorus nutrient and oxygen consumption of organic matter pollution, the lake comprehensive province V class water in ground water quality standard, mainly is the total nitrogen, total phosphorus, the lake eutrophication state, including drinking water sources are located in Hefei basin west waters is particularly acute. Due to the eutrophication of water quality, a large number of algae grow in the lake, and algae growth rate is fast, the life cycle is short. A large number of dead algae rot and stink, and floating in the lake, block the sun, algae in the water photosynthesis weakened, oxygen in the water decreased, resulting in the death of a large number of fish and shrimp, but also to the production and life of the surrounding residents have a serious impact^[2].

2.3 Industrial Production and Pollution

Hefei is a new industrial city developed after liberation. Now it has formed a complete industrial system of metallurgy, machinery, electronics, chemical industry, building materials, light industry, textile, food and other industries. The number of factories and enterprises accounts for 52% of the whole basin, and the annual discharge of industrial waste water in the whole basin is 1.4 billion

tons, of which Hefei accounts for 73.7%. Except Hefei and Chaohu, a few factories have pollution treatment devices, and the rest are directly discharged into natural water bodies. A large number of industrial wastewater is discharged into Chaohu Lake, Chaohu lake sewage volume is the first of the Five Great Lakes, chaohu city has 54 large and medium-sized enterprises, there are Wanwei high-tech, Chaodong shares, xinli pharmaceutical, Huoxing chemical four listed companies.

3. Governance Measures

3.1 Treatment of Pollution Sources

First of all, the construction of enterprises that have not yet been established and pollute heavily will be strictly prohibited, and the existing small enterprises that pollute heavily will be banned and closed down in strict accordance with the requirements of The State Council. To the heavy pollution of enterprises ordered to stop production period rectification or relocation, to some of the lighter pollution of enterprises to help guide their sewage treatment, and supervision and detection of their sewage discharge to ensure that sewage discharge standards. At present, the municipal Environmental Protection Bureau will be more than 100 tons of daily sewage discharge, COD up to 30 kilograms of enterprises as pollution sources. Implementing key monitoring. Secondly, accelerate the construction of sewage collection network, improve the capacity and efficiency of sewage collection and treatment^[3].

3.2 Treatment of the Interior of Polluted Lakes

Chaohu lake internal governance measures are divided into physical measures, chemical measures and biological measures. The physical measure is to remove silt from the bottom of the lake. The large amount of silt at the bottom of the lake is an important cause of the pollution of Chaohu Lake. The release of pollutants from the bottom of the lake can cause internal pollution and aggravate the deterioration of the lake. The use of environmental dredging to control the inner source of lake pollution has achieved obvious results in Dianchi Lake and has been affirmed by national leaders and relevant departments. There is a large area of polluted sediment deposition near the drinking water sources in Hefei and Chaohu. Sediment removal is very important for purifying drinking water sources and ensuring drinking water health. At the same time, attention should be paid to bringing fresh water into the lake to speed up the renewal of chaohu lake water cycle.

3.3 Strengthening the Chaohu Lake into the River Channel Monitoring

Chaohu's seven main rivers flow into the lake through several cities and counties, some of which are seriously polluted, directly affecting the treatment of water pollution in Chaohu Lake. At present, Chaohu City Environmental Protection Bureau has set up monitoring points in all the mouth of the lake, the implementation of 24 hours online monitoring to meet the standards of three types of water, not up to three types of water from its upstream to find reasons to solve as soon as possible, and the river sewage interception. At present, Chaohu lake has a total of 12 monitoring points on the water quality monitoring at any time, the relevant detection departments can see the water quality of the monitoring point at any time, in order to facilitate the deterioration of the water quality of timely detection and treatment, which will greatly improve the efficiency of water pollution prevention and control work^[4].

3.4 Rural Problems

Should vigorously spread environmental protection knowledge to farmers, advocate the use of organic fertilizer, reduce the amount of chemical fertilizer and pesticide application, to improve the utilization rate of chemical fertilizer and pesticide. We advocate returning farmland to forests, which can reduce the use of chemical fertilizers and pesticides and reduce water loss and purify the air. Guide farmers to practice livestock and poultry centralized breeding. Separation of excrement and urine for full use. Manure, for example, can be used to develop biogas, and waste residue can be used to grow fish. Actively promote rural garbage centralized treatment mechanism and so on.

4. Conclusion

Chaohu Lake, as one of the "three rivers and three lakes" of The State Council, has a long way to go. Although under the efforts of relevant departments. The deterioration of water quality in Chaohu Lake basin has been controlled to a certain extent and the treatment effect has been greatly improved, but it is still in the state of hypertrophication. Great Chaohu Lake, its clear and turbid relationship with the fate of one party. He not only gave birth to thousands of years of historical civilization in the middle Of Anhui Plain, but also bears the survival and development of millions of people in the basin. Therefore, the control of chaohu lake pollution will be carried out to the end.

References:

- [1]Yang Xiong. Correction to: Water pollution characteristics and analysis of Chaohu Lake basin by using different assessment methods[J]. Environmental science and pollution research international,2020,27(16).
- [2]Jiang H.Study on watershed environmental management system based on integrated ecosystem management concept: From the perspective of water pollution control in Chaohu Lake basin [J]. Journal of chaohu university,2017,19(02):10-14.
- [3]Zhou Xin, Wang Xinyuan. Study on water pollution control in Chaohu Lake Basin [J]. Resources Development and Market,2007(09):841-842+814.
- [4]Xu G H. Study on water pollution control in Chaohu Lake Basin [D]. Anhui Agricultural University,2002.