

# *The Impact of Water Pollution on Human Society*

## *—Taking Tarim River as an Example*

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**Abstract:** From 1950s, the Tarim river resources have been developed. More and more human activities are taking part in this place. At the same time, it shows the potential of the development of the economy. However, it also bring back a big damage and pollution to this place due to the fact of overusing. “Tragdy of Commons” describe the exact same issue as this essay states. The topic for this essay is to analyze the balance between the development of the economy and the environmental issues. The analyzing method is literature review. By using the Fragmentation of water resource protection and cleaning systems, improving supervision and other effective way to overcome the negative effect of the development.

**Keywords:** contaminated water, tragedy of commons, human activities, treatment method

### 1. Introduction

From the 1950s, under the action of human economic and social activities, with the development and utilization of water resources as the core, the regional economy of the Tarim River has achieved very long-term development. However, with the unreasonable exploitation of water and soil resources, the rapidly expanding cultivated land area, and the encroachment of ecological water by agricultural water, the environmental problems in the Tarim River basin are prominent. Nowadays, the water pollution has become the main problem of our human society, this paper will deeply research this side of impact. This paper will focus on the cause and the detrimental effect of the environmental pollution, especially the water pollution. The Tarim River began to stop flowing, and the “Commons tragedy” occurred in the Tarim River basin. In order to improve the ecological resources and environment of the Tarim River basin, the government began to strengthen the unified management of water resources and the improvement of water conservancy projects in the Tarim River Basin since 2001, which improved the ecological resources and environment of the basin to some extent. In 2016, water was restored within 250 kilometers of the river [1].

### 2. This Analysis of the Causes of the “Tragedy of Commons” in Tarim River Basin

In the following paragraphs, it describes the basic property of the river basin, and the policies that overcome the problems.

## **2.1. The Scarcity of Water Resources**

The water resources of the Tarim River have the characteristics of quasi-public goods, which are non-exclusive and competitive. That is, everyone in the Tarim River basin has the right to use the water resources of the Tarim River, but at the same time, the water resources are limited and therefore competitive. Furthermore, the Tarim River Basin ecological water consumption is lower than the ecological water requirement: river ecological water demand according to the ecological system of water requirement is stable for a period, and ecological water use with the external environment changing constantly is greater than the ecological water demand, allowing flow field ecosystem sustainable development coordination to be implemented. It can be seen that the water resources in Tarim River are scarce and cannot meet the needs of economic and social development in the basin.

## **2.2. The Transformation of the Purpose of Economic Policies**

The change of policy environment will also have a certain impact on the environmental change of the watershed. In the late 1990s, Xinjiang implemented the economic development strategy of "one black and one white", vigorously developed the oil industry and cotton cultivation, resulting in cotton becoming one of the leading industries in Xinjiang since the 21st century. Put forward to develop "red industry" again in recent years, large area grows tomato, red jujube, and pepper [1]. The development of white industry and red industry is based on land resources, so the change of policy environment will further lead to the expansion of cultivated land area in the basin. After 2000, the industrial structure is adjusted, the government advocates the planting of economic forest vigorously, just make the area of forest of flow domain increases somewhat. Under the influence of the above policies, the irrigated area of the basin expanded rapidly, and the contradiction between supply and demand of water resources became increasingly acute.

## **2.3. Fragmentation of Water Resources Protection Systems**

In the process of water resources management in the Tarim River basin, scattered and modular management is adopted. Before 2011, the four headwaters of the Tarim River Basin were all managed within their jurisdiction by watershed management institutions set up by local governments along the route, while the Tarim River Basin Management Bureau only had the right to manage the main stream, and it was difficult to manage the water in the headwaters [1]. The source and flow management units are both water resources users and water resources managers, resulting in the widespread phenomenon of artificial irrational use of water resources and the low price of agricultural water. No subordinate relations administration of origin and the Tarim River basin administration, lack of corresponding organization management system, independent power between each other, function is not clear, their relationship is not clear, lead to the tower wood river basin water resources management fragmentation scattered, law enforcement and efficiency is not high, makes life difficult for watershed management. In the whole management process of Tarim River basin, it is obvious that the upper reaches manage by themselves, and the middle reaches cannot take into account the lower reaches. Surface water management does not take into account groundwater; In the process of land resource management, there are frequent acts of no reclamation, which increase the consumption of water resources, resulting in the cut-off of the Tarim River for 23 years.

## **3. The Analysis of the Government's Treatment Methods and Their Effects**

Through the establishment of cooperation between local government management mechanism, strengthen the regulations and ways the most strict water resources protection system, controlling water pipe water according to law, establish a market-oriented pricing system of water resources and

the measures such as water rights trading system, build a powerful tarim river water resources protection system to ensure the stability of river basin of social and economic development has the positive significance [2].

### **3.1. Fragmented Water Resources and Optimized Cooperative Implement**

At the moment, the Tarim River basin's administrative management mode cannot meet the demand for rational allocation of water resources in the new era, nor can it meet the demand for combining economic development with ecological environment. In order to achieve the goal of controlling the Tarim River basin, it is necessary to make a long-term plan. Instead of simply repairing the existing system, it is necessary to establish a new and efficient system that can adapt to local economic development in order to better solve the Tarim River basin's water resource management problems. In the process of Tarim River basin management, a single resource management approach cannot solve the problems of excessive expansion of cultivated land and perennial river flow interruption. Only the basin as a whole, water resources, and cultivated land resources are coordinated; avoid separate management of water and soil resources. At the same time, the headstream of the Tarim River, its upper, middle, and lower reaches, surface water and groundwater, land resources, and water resources are interrelated as a whole. In 2011, the autonomous region decided to integrate and merge the existing branch mana. The four main headwaters management institutions were restructured and transferred to the Tarim River Basin Administration for direct management and control [2]. Therefore, a new unified, efficient and authoritative management system of water resources in the Tarim River Basin has been established, and the water resources management, comprehensive management and supervision functions of the Tarim River Basin Administration Bureau have been fully exercised. In 2016, the unified management of the Tarim River basin achieved remarkable results and made a new breakthrough, with the actual water supply of 14.86 billion m<sup>3</sup> in 2016 [2]. It is necessary to establish a series of safeguard measures to ensure the effectiveness of the unified protection system of Tarim River Basin. Establish corresponding policies and regulations to ensure the implementation of the unified management system. Only by making full use of policies and systems can we carry out system reform according to local conditions, further clarify the ownership of water rights, and improve the effectiveness of management. Necessary administrative measures should be taken when determining water rights. Necessary administrative measures are the basis to ensure the effective use of water resources, and a reasonable and effective modern water source management system should be established on the basis of the current management system. To establish perfect engineering supporting facilities, which is the guarantee of good and efficient operation of the water system. Scientific planning and rational allocation of water resources are the top priority for the sustainable development of water resources.

### **3.2. Improve the Water Resources Supervision System of Tarim River**

To improve the water resources supervision system of the Tarim River, implement the joint supervision of groundwater and surface water, especially strengthen the supervision of groundwater, reduce the space occupied by the surge of agricultural water consumption caused by the disorderly land reclamation, and realize the sustainable development of the ecosystem of the Tarim River basin [3]. Based on the Assessment Measures for Implementing the Strictest Water Resources protection System issued by The General Office of Chinese Council on January 2, 2013, the irrigated area of the Tarim River basin is strictly controlled in order to achieve the main goals of rational development, utilization, conservation and protection of water resources of the Tarim River [4]. In 2017, the strictest water resources management system was further implemented in the Tarim river basin, and the annual total water use was controlled within 154m<sup>3</sup>. Strengthen supervision, implement the strictest water

resources protection system, strengthen the means of river basin water resources supervision, and strive to build an integrated protection and control platform for river basin water resources management. On the one hand, enhance the sense of responsibility of managers. On the other hand, it is helpful to improve the water-saving consciousness of the actors and standardize the water-using mode of the actors.

### 3.3. Vision of Health Improvement from Polluted Water Resources

The water quality of rivers and lakes in China is declining, but the incidence of malignant tumors among residents is increasing rapidly. Although the mortality rate of cancer in rural areas was significantly lower than that in urban areas, the mortality rate of cancer in rural areas increased rapidly from 2002 to 2009, with an average annual growth rate as high as 10.87%, and the gap between them became smaller and smaller. Cancers of the digestive system, such as stomach, liver and esophagus, have been the top three causes of death in rural China, accounting for more than 60 percent of all malignant cancer deaths [5]. Compared with urban areas, rural areas face greater health risks from industrial water pollution. Several studies have reported the phenomenon of "cancer villages" around polluted rivers in China, where industrial activity is heavy. Despite the lack of strong epidemiological evidence, the Chinese Center for Disease Control and Prevention team confirmed the direct relationship between the high incidence of cancer and water pollution in the Huaihe River Basin through an eight-year follow-up survey of "cancer villages" in the Huaihe River Basin.

Based on the above research findings, we can draw three policy implications [2].

First of all, Compared with other water environmental pollutants, the inorganic pollutants contained in industrial wastewater are more difficult to deal with and decompose, and do great harm to human body. It is urgent to do a good job in the treatment of industrial wastewater of key pollution sources. Optimize the structure of industrial production, levy water environmental pollution tax, realize the centralized treatment of industrial wastewater, promote the resource utilization of industrial wastewater with circular economy technology and so on, these measures will reduce the damage of industrial wastewater to water environment quality to a certain extent. In addition, the disease caused by industrial water pollution is generally long-term, chronic, but the current research in the field of environmental health scientific research is weak, the health loss caused by industrial water pollution is difficult to measure because of the lack of data and standards. To reduce the occurrence of water pollution-related diseases and to prevent them as much as possible, we should prioritize environmental health research, conduct evaluation activities of the damage to public health caused by various pollutants, and establish a human health warning mechanism for water pollution.

Secondly, Economic growth, environmental quality and public health are closely related, and they are all goals of national economic development. We must not blindly pursue economic growth while ignoring environmental and health issues, and we should pay attention to the accounting of public health losses caused by environmental pollution. In the current national economic accounting, environmental pollution and public health losses are rarely reflected and deducted. The long-term distorted GDP accounting system will lead to the bias and error of economic decision-making, and the final consequence can only be the unsustainable economic development. Therefore, it is necessary to establish and improve the environmental and health monitoring system as soon as possible, strengthen the timely and systematic evaluation of the public health loss caused by environmental pollution in the macroeconomic accounting system, and provide effective information support for the comprehensive consideration of the three-party relationship between economic development, environmental protection and public health in the process of economic policy making and implementation.

Last but not the least, according to the statistics, Medical condition and education level also have significant positive effect on human health. China has made a lot of work in building social security

and improving public health. However, the level of public health is a whole and continuous process. There is still much room for improvement in these measures. Increase the financial contribution to public health and health education, especially encourage and promote private contributions to public health and health education, and allow the public participation mechanism to play a critical role in environmental health risk management [6].

#### 4. Conclusion

In conclusion, there are several ways to solve this complicated problem, such as using Fragmentation of water resources management systems and through optimizing policies, the environment conditions have been changed a lot. Although environmental pollution is a worldwide problem, the detrimental effects have been mitigated a lot. However, the methods still have lots of optimization options. These solutions have not been implemented in society, and the reliability of the solutions is not sure. I hope that the issue can be solved in the near future.

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